The following documents are to accompany the remarks of Donald Zeigler made at the Palm Desert City Council meeting on August 24th regarding the issue of heat mitigation.

1. **Remarks made by Donald Zeigler at the August 24th meeting.**
2. An email previously sent by Donald Zeigler to all Council members.
3. A New York Times article from May 24th headlined 'Heat Wave and Blackout would Send Half of Phoenix to E.R., Study Says'. It graphically but accurately describes what could happen if the power grid fails during a Heat Wave. While it is about a study done in Phoenix, the same results could be expected in Palm Desert under the same circumstances.
4. A New York Times article from earlier this year headlined 'Backup Power: A Growing Need if You Can Afford It '. It addresses some of the same issues as the May 24th article but includes expanded material, so the two articles complement each other.
5. A recent Desert Sun Editorial that expresses their concern that heat mitigation is not being adequately addressed by the State of California. The same critique could possibly also be applied to all levels of government, including our county and city.
6. A document from FEMA that itemizes what that federal agency can provide to assist local communities in preparing for what they view as the potential disaster of a power outage during a heat wave. It is an example of many other programs by non-profits and other government agencies that have money and programs available to help cities prepare ways to mitigate heat wave disasters. Palm Desert needs to aggressively pursue all these programs.
7. Finally, an article from Spectrum News describing a housing development completed in Menifee that should serve as a guide for future development in Palm Desert. Heat mitigation utilizing a local grid was included in the design for these houses so they can continue to have ongoing power in the event of a grid failure. This should be the goal for all new development in Palm Desert, and ultimately every property in the city should be retrofitted to be energy reliant.

My name is Donald Zeigler and I live in Palm Desert. I am here to speak about the dangers and opportunities that go with living in one of the hottest places on earth in the summer. Our valley is vulnerable to the most dangerous climate change impact recognized to date, that of an uncontrolled power outage during a severe, long duration heat wave. I have provided for you a copy of an article that was in the New York Times on May 24 headlined 'Heat Wave and Blackout Would Send Half of Phoenix to E.R., Study Says '. It applies to Phoenix, but much of what is described in the article would happen here under the same conditions. I recently sent an email to you expressing my concerns about this. I received a reply and met with Mindy Esqueda, your Emergency Services Coordinator. She gave me assurance that she is aware of the dangers of such an event and is working on the plan for a city response. I urge you to support her efforts in doing this. But planning a response to such an event is not enough, there are also steps that can be taken to mitigate the impact of the event before it happens.

Therefore, I believe it is essential the city explore and evaluate alternative solutions to the bigger problem, which is the total reliance on utility providers that cannot be counted on to deliver reliable power. This can only be done by providing local backup power capabilities. In my email, I listed several actions that should be considered to address how the issue of power resilience might be approached. I don't have time here to address them all with you, so I hope you will look at each item in my email seriously. I also request that you look at some of the other material I have included in your handout that provide examples of things being done in other places.

It is imperative that Palm Desert seriously address issues raised by the changing climate. If the power grid fails and there is a mass casualty event during a heat wave, it could cause not only unacceptable human suffering, but also the collapse of our summer economy. Billions of dollars of investment could be lost if people decide that the risk of staying in the valley in the summer is not worth the danger. Year-round retirees living in the valley would face a challenging financial dilemma; sell a home that has lost value and move somewhere else or stay and face the risk of not surviving the summer heat. It is too late to prevent global warming, that ship has sailed. But if our city wisely plans for a hotter future, I believe we can not only survive but can continue to grow and thrive despite the hotter temperatures. The city is responsible for the safety and well-being of 50,000 people who live in a

very extreme and potentially dangerous environment. The situation can either be addressed in a way that makes our city a leader to the world or we can pretend it doesn't really exist and there is nothing to be done about it. I am confident that this city council is dedicated to our city's well-being and will address heat mitigation with the urgency that is needed.

July 21, 2023

To: Members of the Palm Desert City Council

The Coachella Valley of California Is one of the most highly populated areas in the United States, and maybe the world, that is vulnerable to the most dangerous climate change impact recognized to date, that of a severe, long duration heat wave. It shares this exposure with other parts of the world but the valley's unique geography and the fact that the valley shares an electrical grid with a much larger area means that the likelihood of a failure of electrical service in the valley at a time of extreme temperatures is heightened and the impact such an event in the immediate area could be catastrophic.

It is therefore essential that planning for an uncontrolled, long-duration electrical outage at a time of extreme temperatures be undertaken.

This is a very large and complex problem that ultimately requires state and federal attention. A Desert Sun editorial from July 16th stressed the need for the state of California to take leadership in addressing the dangers of heat waves. A bill has been introduced in the US Congress to add Heat Waves as a natural disaster that could allow FEMA to address them like they do hurricanes and floods. The Department of Defense now has a program to ensure power resilience at military bases so that, if the utility power goes down, a military base and its surrounding community can continue to function using backup power for up to 14 days.

These efforts are necessary, but they don't replace the need for local governments in the Coachella Valley to step up and start to define the issues locally and find ways to protect their citizens from a very real risk.

A New York Times article from May 24 described what studies have shown would result if the power were to fail in Phoenix during a heat wave. The headline is "Heat Wave and Blackout Would Send Half of Phoenix to E.R., Study Says ". But steps have already been taken in Phoenix and other cities that have recognized their responsibilities to prevent such tragedies. Perhaps the most important thing they have done, and a very first step that should be taken by the Palm Desert city council, is to identify a single person as a Heat Mitigation Officer whose job is to concentrate on creating a power outage plan.

But beyond that, the officers in other cities study other measures that can be done to help enable their cities to be more livable and safer as summer temperatures continue to rise over the coming years. Simple things like planting shade trees or putting reflective surfaces on asphalt can dramatically reduce surface temperatures and nighttime heat retention. The Heat Mitigation Officer for Palm Desert could be tasked to see what other cities are doing and bring in knowledgeable resources to identify additional things that can be done to ensure power resilience to prevent future outages as well as make Palm Desert more livable in the summer.

There is a Palm Desert Local Hazard Mitigation Plan that was written in 2017. It's total plan regarding a response to a heat wave is:

The City of Palm Desert participates with the Riverside County Office of Emergency Services plan for extreme heat conditions and has a cooling station located at (1) The Joslyn Center which is located at 73750 Catalina Way in Palm Desert and the (2) Palm Desert Community Center located at 43900 San Pablo Avenue in Palm Desert. (See Riverside County OA MJHMP Section 5.3.13).

That's it. The plan does reference the Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan which is undergoing update for 2023. That plan does a minimal job of laying out the risk of a power failure during a heat wave, but it obviously relies on the local bodies, such as the city of Palm Desert, to specify responses. Hopefully, the city of Palm Desert is involved with the preparation of the county plan, and it would seem to provide an excellent opportunity for Palm Desert to provide some direction and sense of urgency that the county plan includes power mitigation proposals that can apply to all the valley cities.

The economic cost to the valley of a heat-wave catastrophe would be enormous. Year-round residents could no longer feel safe. The value of everything built in this very hot valley would collapse. Every effort should be made to make this a livable place in the summer even as temperatures continue to rise. But Palm Desert cannot bury its head in the desert sand and pretend things aren't changing. The Palm Desert City Council can make history by showing how a city can prepare itself for a future that the entire world will soon be facing.

It is therefore recommended that the Palm Desert City Council consider the following:

1. Designate an existing city staff person as the city's Heat Mitigation Officer or create such a position. Examples exist in other cities around the country that have created such a position and they should be studied to determine the precise responsibilities and appropriate level and salary for the job.

2. Suggested responsibilities should include:
    A. Interfacing with Riverside County in updating the county and city Local Hazard Mitigation Plans. At a minimum, the plans must provide clear direction for the city and county response to protect citizens in the event of an extended, unplanned power outage.
    B. Assuring that all citizens and organizations in the city are aware of the plan and prepared to execute it in the event of a power failure.
    C. Co-ordinate with SoCal Edison and IID to assure that the utilities are making adequate preparations to provide reliable power during severe heat wave events and are providing adequate resources as the city's economy grows.
    D. Co-ordinate with Federal, State and County bodies that are addressing heat mitigation issues. There are several efforts underway at these levels to reduce the negative impacts of increasing heat world-wide. Some programs may provide funding for projects that could be undertaken by the city to make summer living in the Palm Desert safer, less expensive, and more comfortable.
    E. Co-ordinate with other valley cities to assure the Palm Desert Plan blends with those developed by the other cities. Ideally, there should be a CVAG-level position to manage the entire valley heat mitigation effort. But the city of Palm Desert should undertake this effort whether other valley cities create similar positions or not.
    F. Co-ordinate with local entities such as businesses and HOAs to develop programs the city could undertake to help them manage responses to the heat. As an example, HOA's could perhaps be guided in developing cooling centers powered by

backup batteries or generators as safe places to go in the event of a power failure for their residents. The same could be done for hotels and timeshare properties in the city.

G. Recommend possible changes to city policies to ensure that labor regulations, construction regulations and other city policies and regulations adequately account for the hotter summer conditions. This could, for example, include work conditions for outdoor workers during extreme heat, and residential and workplace enhancements to ensure safe environments as summer temperatures increase.

H. Provide guidance for new developments as part of the approval process for them. For example, each new development could require a power resilience capability to be included in their plans. Such projects are already being developed in California that assure reliable power for new homes even if the utility power fails. These projects should be studied to see if they could apply in Palm Desert.

I. Work with local health care providers to ensure that there is adequate capacity to treat a mass casualty event that would result if valley power were unavailable for an extended period on a very hot day. Even under normal summer weather conditions, health care must be provided for those suffering from the heat on an ongoing basis, so the officer could continually assess that local hospitals and emergency response teams are properly equipped and trained to treat such events.

J. The technology for the provision of electrical power is changing rapidly. The Heat Mitigation Officer should continuously evaluate new developments to determine when and how new technologies could be applied to businesses and homeowners in Palm Desert. These changes could lead to lower costs and more reliability for electricity, but each will need to be carefully evaluated. There are several non-profit organizations and industry associations dedicated to working on the reliable provision of power and the city officer would need to establish and maintain relationships with them.

3. In addition to the designation of a City Heat Mitigation Officer, the city should also create a citizens advisory committee to assist the officer in the development and implementation of the many assignments described above.
4. There is certainly more that could be considered to tackle this issue. This is only an attempt to define some initial first steps to take. The resources of the city should be tasked to suggest and evaluate other possible actions.

It is imperative that Palm Desert as well as other Coachella Valley cities seriously address issues raised by the changing climate. It is not inconceivable that in 5 years or less, a heat wave with consecutive days with temperatures above 130 degrees will occur. If the power grid fails and there is a mass casualty event under those conditions, it could cause the collapse of the summer economy for the entire valley. Billions of dollars of investment would be in jeopardy if not lost completely as people decide if the risk of staying in the valley in the summer is worth the danger. Year-round residence would likely not be a choice made by most current residents if they had the option. Many retirees living in the valley would face a challenging financial dilemma; sell a home that has lost value and move somewhere else or stay and face the risk of surviving the heat. Hopefully, steps taken over the next few years by valley cities to mitigate the heat will allow residents to not have to make such a choice.

Thank you for considering this letter and I look forward to a response. More importantly, I hope you seriously follow up on an evaluation of the ideas presented here.

Donald Zeigler

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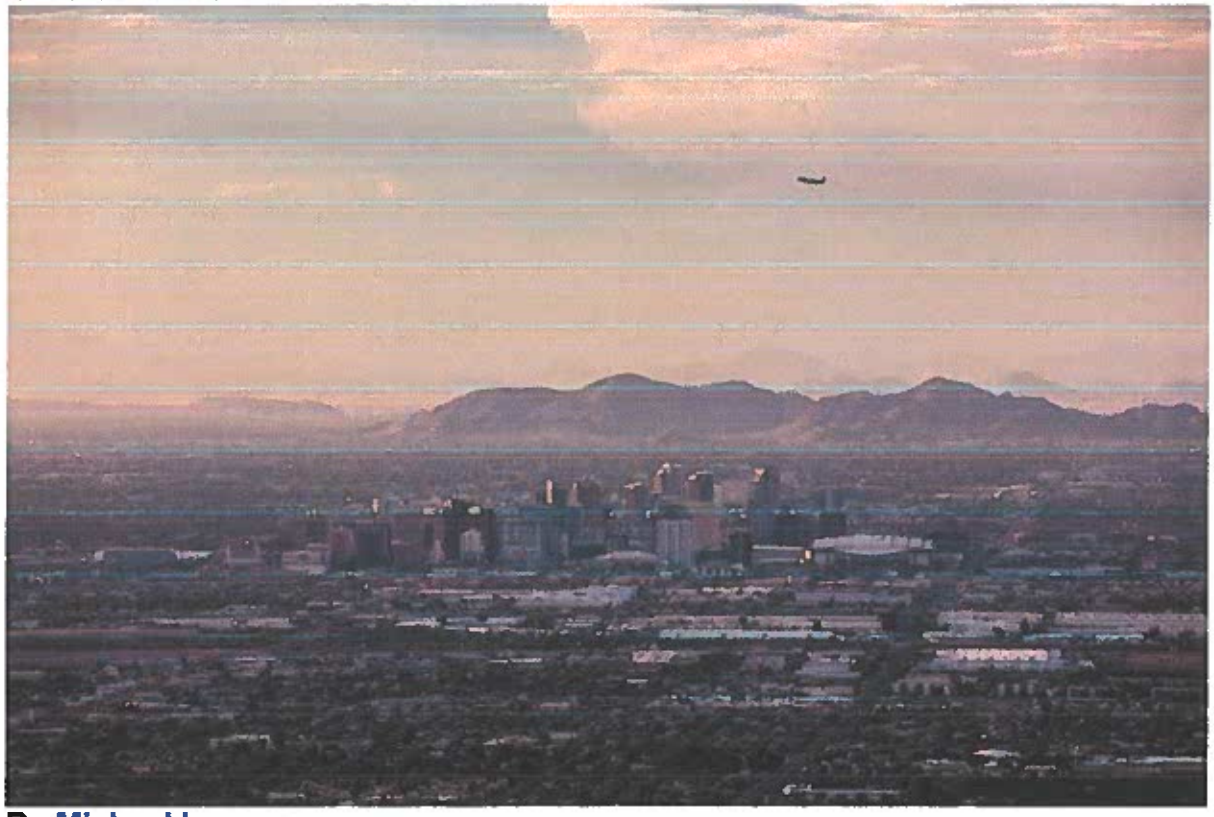
Heat Wave and Blackout Would Send Half of Phoenix to E.R., Study Says

New research warns that nearly 800,000 residents would need emergency medical care for heat stroke and other illnesses in an extended power failure. Other cities are also at risk.

A view of the Phoenix from South Mountain last summer. An industry analysis released this month warns of the threat of citywide blackouts during heatwaves.Credit...Caitlin O'Hara for The New York Times



By Michael Levenson
May 23, 2023

If a multiday blackout in Phoenix coincided with a heat wave, nearly half the population would require emergency department care for heat stroke or other heat-related illnesses, a new study suggests.

While Phoenix was the most extreme example, the study warned that other cities are also at risk. Since 2015, the number of major blackouts nationwide has more than

doubled. At the same time, climate change is helping make heat waves worse and increasing instances of extreme weather around the world.

The study, published Tuesday in the journal Environmental Science and Technology, suggests that the risk to cities would be compounded if a hurricane, cyberattack or wind storm were to knock out power during a heat wave and deprive thousands of air-conditioning.

This summer, two-thirds of North America, including the Southwest, could experience shortfalls in the electrical grid, particularly during periods of extreme heat when demand for air-conditioning spikes, straining resources, according to an analysis released this month. Phoenix's mayor, Kate Gallego, has urged the federal government to add extreme heat to the list of disasters like floods and hurricanes that could prompt a federal disaster declaration.

Continue reading the main story

The new analysis found that Phoenix, which is heavily reliant on air-conditioning to keep residents cool in the desert heat, would experience immense loss of life and illness if a citywide blackout during a heat wave lasted for two days, with power gradually restored over the next three days.

Under that scenario, an estimated 789,600 people would require emergency department care for heat-related illnesses, overwhelming the city's hospital system, which has only 3,000 emergency department beds, the study said. An estimated 12,800 people in Phoenix would die, the study said.

"I describe this as probably the greatest climate-related hazard we can imagine: a blackout during a heat wave," said Brian Stone Jr., the lead author of the study and a professor in the School of City and Regional Planning at the Georgia Institute of Technology.

To anticipate the effects of a prolonged loss of power during extreme heat, researchers modeled the temperatures that residents in Atlanta, Detroit and Phoenix would be exposed to on an hourly basis, if the power were on during a heat wave, and if it was not.
Image

A heat relief station at the Salvation Army Phoenix Citadel Corps in 2021.Credit...Juan Arredondo for The New York Times

The researchers began by examining past temperatures in those three cities. In Phoenix, they analyzed temperatures from a July 2006 heat wave, when the average maximum temperature was 113 degrees.

Continue reading the main story

Then the researchers estimated what the temperature would be at hundreds of points across the cities, not just at the airport, where the temperature is usually measured.

They estimated indoor temperatures for various residential buildings and used annual surveys collected by the U.S. Department of Labor to model how much time residents were likely to spend indoors and outdoors, depending on their age, sex, occupation and income. And the authors used census data to factor in the racial makeup of the three cities, Dr. Stone said.

In Atlanta, 11,600 people, or about 3 percent of the population, would require emergency department care if a five-day heat wave coincided with a multiday blackout, the team found. The city has only about 2,000 emergency department beds, and the scientists estimated that six people in Atlanta would die during the dual crises.

The team, which also included researchers from Arizona State University and the University of Michigan, found that 216 people would die during a heat wave and power failure in Detroit.

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The researchers acknowledged certain limitations in their findings. For example, their model assumed that people would stay put during a heat wave and blackout. In reality, the authors noted, some people would be able to relocate and emergency workers would try to evacuate residents and set up power generators at cooling centers.

Kristie L. Ebi, a professor at the University of Washington Center for Health and the Global Environment, who was not involved in the research, called it "quite an impressive study," that should encourage cities to think about ways to protect vulnerable residents, including pregnant women, outdoor workers and people in historically redlined communities, which have fewer trees and more heat-trapping pavement.

Image

Phoenix residents seeking refuge from the heat in 2021. If enough trees were planted to shade half of the streets, deaths during dual crises would drop by 27 percent in Phoenix, the study said.Credit...Juan Arredondo for The New York Times

David Hondula, an author of the study and Phoenix's first director of heat response and mitigation, said that while officials there have been deeply concerned about potential illnesses and deaths during a heat wave and blackout, "this is the first time we have seen a number, and it's obviously quite an alarming number."

There are strategies, the study said, that could help protect residents during overlapping blackouts and heat waves.

Continue reading the main story

If the cities planted enough trees to shade half of their streets, deaths would drop by 14 percent in Atlanta, 19 percent in Detroit and 27 percent in Phoenix, the study said.

And if they installed highly reflective "cool roofs" on every building, deaths would drop by 21 percent in Atlanta, 23 percent in Detroit and 66 percent in Phoenix.

But as climate change is expected to increase the frequency, length and intensity of heat waves, the study projected that deaths and illnesses would rise even further.

Jane W. Baldwin, an assistant professor of earth system science at the University of California Irvine, said that the findings should underscore the importance of investing in a stronger electrical grid. That would "help prevent this terrifying compound risk in the present and will continue to pay dividends in the future as heat waves continue to worsen," Dr. Baldwin said.

Michael Levenson joined The Times in December 2019. He was previously a reporter at The Boston Globe, where he covered local, state and national politics and news.

A version of this article appears in print on May 24, 2023, Section A, Page 15 of the New York edition with the headline: Study Shows Devastating Heat Risk in Phoenix. Order Reprints | Today's Paper | Subscribe

Backup Power: A Growing Need, if You Can Afford It

Extreme weather linked to climate change is causing more blackouts. But generators and batteries are still out of reach for many.

David and Eliana Mundula with their daughter. The couple bought a generator after going through a series of weather-related power outages at their suburban home outside Charlotte, N.C.Credit...Travis Dove for The New York Times

By Ivan Penn and Peter Eavis

The reporters spent several days traveling around North Carolina to report this story.

May 6, 2023

When frigid weather caused rolling blackouts on Christmas Eve across North Carolina, Eliana and David Mundula quickly grew worried about their 2½-week-old daughter, whom they had brought home days earlier from a neonatal intensive care unit.

"The temperature was dropping in the house," said Ms. Mundula, who lives in Matthews, south of Charlotte. "I became angry."

But her husband pulled out a small gasoline generator a neighbor had convinced them to buy a couple of years earlier, allowing them to use a portable heater and restart their refrigerator, keeping them going for much of the five-hour outage.

North of Charlotte, in the town of Cornelius, Gladys Henderson, an 80-year-old former cafeteria worker, was less fortunate. She did not have a generator and resorted to candles, a flashlight and an old kerosene heater to get through a different recent outage.

"I lose power just about all the time," Ms. Henderson said. "Sometimes it goes off and just stays off."

Ms. Henderson is on the losing end of a new energy divide that is leaving millions of people dangerously exposed to the heat and cold.

Gladys Henderson, who lives north of Charlotte, doesn't have a generator and relies on her kerosene heater to keep warm when the power goes out.Credit...Travis Dove for The New York Times

As climate change increases the severity of heat waves, cold spells and other extreme weather, blackouts are becoming more common. In the 11 years to 2021, there were 986 weather-related power outages in the United States, nearly twice as many as in the previous 11 years, according to government data analyzed by Climate Central, a nonprofit group of scientists. The average U.S. electric utility customer lost power for nearly eight hours in 2021, according to the Energy Information Administration, more than twice as long as in 2013, the earliest year for which that data is available.

Outages are becoming so common that generators and other backup power devices are seen by some as essential. But many people like Ms. Henderson cannot afford generators or the fuel on which they run. Even after strong sales in recent years, Generac, the leading seller of home generators, estimates that fewer than 6 percent of U.S. homes have a standby generator.

Energy experts warn that power outages will become more common because of extreme weather linked to climate change. And those blackouts will hurt more people as Americans buy electric heat pumps and battery-powered cars to replace furnaces and vehicles that burn fossil fuels — a shift essential to limiting climate change.

"The grids will be more vulnerable," said Najmedin Meshkati, an engineering professor at the University of Southern California and an expert in disaster response. "That furthers the divide between the haves and the have-nots."

The old, the frail and people who live in homes that are not well protected or insulated are most vulnerable, along with those who rely on electrically powered medical equipment or take medications that need to be refrigerated.

Power outages make heat, already a major cause of avoidable deaths, even more of a threat, said Brian Stone Jr., a professor at the Georgia Institute of Technology. He has done research estimating how many people in Atlanta, Detroit and Phoenix would be exposed to extreme temperatures during power outages.

"A concurrent event where you have an extensive blackout during a heat wave is the most deadly type of climate threat we can imagine," he said, noting that the cooling centers in those cities would be able to house only a fraction of the people at greatest risk.

Ashley Ward, a senior policy associate at Duke University's Nicholas Institute for Energy, Environment & Sustainability, has studied how heat affects communities in North Carolina. Her research indicates that high temperatures cause more preterm births. She said that even healthy people who work in high temperatures often suffer heat-related illnesses, particularly if they cannot cool their homes overnight. "A power outage," she said, "is, in many cases, a catastrophic event."

The most recent power crisis in North Carolina, the one on Christmas Eve, occurred when the temperature fell to 9 degrees Fahrenheit in the Charlotte area.

The state's primary utility, Duke Energy, began cutting power to customers to ensure the grid kept operating after power plants failed and customers cranked up the heat in their homes. About 500,000 homes, or 15 percent of the company's customers, lost power in North and South Carolina, the first time the utility used rolling blackouts in the Carolinas.

The Mundulas had been through other weather-related power outages since moving into their suburban home. After renting generators during previous outages, the couple spent $650 to buy one in August 2020 to keep parts of their four-bedroom, two-and-a-half-bathroom house powered. A chorus of engines typically fills their neighborhood when the power fails. "It's just the hum of the generators," Ms. Mundula said, adding that she never heard generators in the lower-income neighborhood of Greensboro where she grew up.

The couple has considered bigger systems like solar with a battery, but those options would cost a lot.

Ms. Henderson, the retired cafeteria worker, lives alone in her three-bedroom home. She relies on family, friends and community groups to help her maintain the house, which gets its electricity from a community-owned utility. Frequent power outages are one of several problems in her historically African American neighborhood, which also floods frequently.

Developers have offered to buy her home, but Ms. Henderson wants to stay put, having lived there for 50 years.

"My problem really is the electrical problem," Ms. Henderson said. "It's very scary."

Duke said it was aware of the risks people like Ms. Henderson faced. The company tracks recurring outages in vulnerable communities to determine if it should bury power lines to reduce the likelihood of blackouts. The company is also developing and testing strategies to ease the strain on the grid when energy demand exceeds supply. Those approaches include having electric cars send power to the grid and installing smart devices that can turn off appliances, reducing energy use.

"So when an extreme weather event hits, we have a grid that can withstand it or quickly recover," said Lon Huber, a senior vice president for customer solutions at Duke Energy.

Other threats to the grid are harder to protect against.

In early December, somebody shot and damaged two Duke substations in Carthage, roughly 90 miles east of Charlotte, cutting off power to thousands of homes for several days. The emergency services received panicked calls from people whose oxygen machines had stopped working, requiring someone to visit those homes and set up pressurized canisters that don't require power, said the town's fire chief, Brian Tyner.

The chief's home doesn't have backup power, either, and he estimates that two-thirds of homes in the area do not have generators. "We couldn't ever justify the price," he said.

Backup power systems can be as small as portable gasoline generators that can cost $500 or less. Often found at construction sites and campgrounds, these devices can power only a few devices at a time. Whole-home systems fueled with propane, natural gas or diesel can provide power for days as long as there is fuel available, but these generators start at around $10,000, including installation, and can cost much more for bigger homes.

Solar panels paired with batteries can provide emissions-free power, but they cost tens of thousands of dollars and typically cannot provide enough to run big appliances and heat pumps for more than a few hours. Those systems are also less reliable during cloudy, rainy or snowy days when there isn't enough sunlight to fully recharge batteries.

Some homeowners who are eager to cut their carbon emissions, reduce their electric bills and gain independence from the electric grid have combined various energy systems, often at a substantial cost.

Annie Dudley, a statistician from Chapel Hill, N.C., slashed her energy consumption a few years ago. She installed a geothermal system, which uses the earth's steady temperature to help heat and cool her home, replacing an aging system that came with the house. She later added 35 solar panels on her roof and two Tesla home batteries, which can provide enough power to meet most of her needs, including charging an electric Volkswagen Golf.

"The neighborhood has lost power a whole lot, but I have not," Ms. Dudley said.

She spent about $52,000 on her solar panels and batteries, but $21,600 of that cost was defrayed by rebates and tax credits. Ms. Dudley estimates that her utility bills are about $2,300 a year lower because of that investment and her geothermal system.

Generator companies believe that growing electricity usage and the threat of outages will keep demand high for their products.

Last year, Generac had $2.8 billion in sales to U.S. homeowners, 250 percent more than in 2017. In recent years, many people bought generators to ensure outages would not interrupt their ability to work from home, said Aaron Jagdfeld, the chief executive of Generac, which is based in Waukesha, Wis. Many people also bought generators because of severe weather, including an extreme heat wave in 2021 in the Pacific Northwest, and winter storm Uri, which caused days of blackouts in Texas and killed an estimated 246 people.

"People are thinking about this," Mr. Jagdfeld said, "in the context of the broader changes in climate and how that may be impacting not only the reliability of power but the things that they need that power provides."

EDITORIALS

California must ensure better communication about power outages amid extreme heat

Desert Sun Editorial Board

You can almost feel the ominous strain of California's electric grid sputtering to a halt.

Under the current heat dome, the latest *excessive heat warning* forecast has temperatures in the Coachella Valley expected to average 113 degrees through next Saturday.

Extreme heat is real – as Desert Sun environmental reporter Erin Rode recently noted, all of the top five hottest summers in Coachella Valley history happened within the past six years, showing how climate change is driving up average temperatures in the region.

Power companies continue to schedule planned outages year round in order to keep the grid running reliably – during the first two weeks of July, SoCal Edison maintenance scheduled a series of outages affecting hundreds of Palm Springs residents.

Last week, Palm Springs leaders criticized Southern California Edison's need for grid work in the summer and the company's communication protocols.

Mayor Lisa Middleton and Councilmember Jeffrey Bernstein admonished the company's notification system, with Middleton saying notices often don't arrive until the outage has concluded, while Bernstein said in his experiences outages either start sooner or last longer than stated in the company's notifications.

During that same city council meeting, a SoCal Edison representative explained notices are typically mailed to impacted customers three to 11 days

in advance, with door hangers posted if there's not enough time for mail. The company also sends automated emails, texts or phone calls, both to warn of a planned outage and to notify if one needs to be canceled.

While planned maintenance is unavoidable, we echo the councilmembers' sentiments that residents should not have to endure sloppily communicated power outage communications, sometimes after the fact, while enduring another excessive heat warning.

Though it's easy to point fingers at SoCal Edison, the bigger crisis is how extreme heat will impact our grid system – and if California is ready for it.

Hint: the state is not ready for it.

At the same time, do we as California residents know how to navigate power outages in real time? Debatable.

We urge California lawmakers to sponsor legislation that requires the government, electric utility companies, or both, to quickly develop a functioning public alert system similar to the AMBER alert notices, whether via app, text message, neighborhood community partnerships, or all of the above, in order to keep people aware of potential electrical outage disruptions and rolling blackouts ahead of time.

The California Energy Commission's website homepage proudly reads, "Leading the state to 100% clean energy future for all." The goal of clean energy by 2045 is one thing – but what about the next 22 years of extreme heat getting worse every summer?

Paying political lip service through yet another task force won't cut it – certainly the technology exists that would enable clearer notifications around power outages.

State legislators should institute a more robust communication strategy to help people, particularly in vulnerable populations, navigate power outages with clearer guidance in real time as the reality of extreme heat persists.

FEMA Fact Sheet

Mitigating the Risk of Extreme Temperatures with Hazard Mitigation Assistance Funds

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation measures that build climate resilience. These funds can be used to plan for and mitigate risks posed by natural hazards, including extreme temperatures. This fact sheet identifies opportunities for hazard mitigation assistance, provides an overview of considerations and identifies other available FEMA resources.

The climate crisis is making heat waves more intense and frequent, taking a toll on health across the country—sending tens of thousands of Americans to the emergency room, increasing risks of heart and respiratory problems, and especially endangering our workers, children, seniors, people with underlying health conditions, and underserved and overburdened communities. Extreme cold can similarly endanger our most underserved and vulnerable populations.

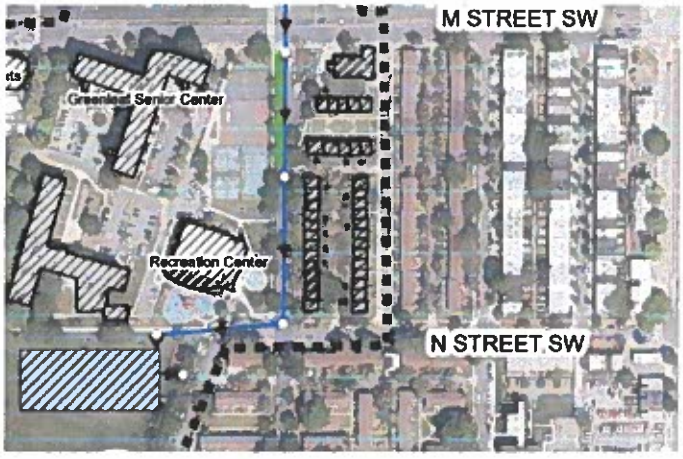

Figure 1: Fiscal Year 2020 BRIC Selection: Blue/Green Stormwater Flood Mitigation in Southwest Washington, DC provides flood risk reduction and heat island mitigation benefits.

Extreme heat and extreme cold impact us differently, but both pose a significant risk to infrastructure (including Community Lifelines) as well as human health and safety. Morbidity and mortality, and physical damage to infrastructure, are increasingly likely during extreme temperature events.

Planning for and implementing mitigation actions for extreme temperatures on a local or regional scale can reduce impacts to help save lives, protect infrastructure, reduce energy demands and improve work productivity and community comfort. The Climate Mapping For Resilience and Adaptation (CMRA) Assessment Tool, released in September 2022, is one tool to help you better understand the past, present and future climate conditions to understand exposure in your area to effectively plan and build more resilient infrastructure in your community.

Potential Extreme Temperature Activities Under HMA

Activities that mitigate the risk of extreme temperature events can be broadly categorized into four areas:

1. ~~Mitigation Planning: Mitigation planning is the foundation of community resilience. Understanding risk and~~ developing actionable community-driven plans are fundamental steps in tackling extreme temperatures and natural hazards more broadly. State, local, tribal and territorial (SLTT) governments can use community planning efforts, including hazard mitigation planning, to engage residents, businesses and partners in efforts to design projects and initiatives that reduce risk and build resilience. Partners can bring resources, data and additional funding to the planning process. Partners may also represent underserved communities and vulnerable populations to ensure a participatory process and accountability. As communities learn more about the current and future impacts of extreme heat and cold, it is important to update Hazard Mitigation Plans as they are the ~~foundation for determining if a project is eligible for FEMA mitigation funding. FEMA mitigation funding fosters greater community resilience and can also be used for other planning-related activities, which may include~~ mapping heat islands to support the vulnerability analysis of the hazard mitigation plan.

Figure 2: Nebraska and Kansas Electrical System Ice and Wind Storm Mitigation Projects hardened power lines against high winds and winter storm loads

2. Multi-Hazard Risk Reduction Projects: Each year, FEMA receives many requests to fund flood control projects, a type of project that can often be designed with a dual purpose of reducing risk related to extreme heat and delivering other resilience benefits. For example, nature-based solutions and green infrastructure can provide shade or natural cooling, water management and other natural benefits.

3. Climate-Smart Building Materials: Mitigation projects can incorporate finishings or construction materials in the project that reduce or help withstand extreme temperatures. These projects may incorporate materials or surfaces that reduce ambient temperatures, often as a co-benefit of another risk reduction activity. These projects could use a lighter color roof surface as part of a wind retrofit project or a flood risk reduction project, or incorporate paving materials that reflect solar energy, enhance water evaporation or have been otherwise modified to mitigate extreme temperature. Projects could also incorporate extreme temperatures into the design criteria, such as considering winter storm impacts on power lines.
4. Resilience Hubs: Critical facilities and community infrastructure are important assets that should be designed to meet the needs of underserved communities during extreme weather events. Hazard mitigation projects can reduce the impacts of extreme heat or extreme cold by providing temperature-controlled environments to protect most at-risk populations. Examples of projects that may fall under this category include:
   - Backup power for heating or cooling centers
     - If a cooling or heating center is designated as a critical facility by the subapplicant, a project could include installation of a secondary source of power to ensure critical functions continue to operate during utility power outages.
   - Heating or cooling systems in publicly owned nonresidential and multifamily residential structures where extreme temperature can increase mortality/morbidity to most at-risk populations
     - In these cases, a clear connection is needed between the proposed mitigation activity and the reduced mortality/morbidity to most at-risk populations to support the evaluation of the project.

How Can FEMA HMA Programs Help?

The Building Resilient Infrastructure and Communities (BRIC), Flood Mitigation Assistance (FMA),[1] Hazard Mitigation Grant Program (HMGP) and HMGP Post-Fire grant program may provide funding to plan for and mitigate the impacts of extreme temperatures.

Examples of opportunities to mitigate the impacts of extreme temperature using FEMA's HMA programs include mitigation planning (mitigation plan updates and mitigation planning-related activities, including integrated hazard mitigation and planning for safer, more resilient, equitable communities), climate smart building materials (retrofitting buildings, including heating or cooling systems), resilience hubs (emergency power for warming or cooling centers), and multi-hazard mitigation projects (providing shade or cool surfaces in public places, or implementing projects that mitigate other hazards and provide a heat reduction co-benefit).

[1] Per section 1366 of the National Flood Insurance Act (42 USC 4104c), mitigation actions under FMA must reduce the risk of flood damage to structures covered under the National Flood Insurance Program.

Visit the HMA web page to learn more about the timing and program-specific requirements of FEMA's HMA programs. Visit FEMA's Hazard Mitigation Planning web page to learn more about mitigation planning policies and resources.

MITIGATION PLANS AND PROJECTS

- SLTTs governments can apply for mitigation planning and project grants to reduce the risk or impact of extreme temperatures. Projects must conform with an approved Hazard Mitigation Plan and be sufficiently developed that the application demonstrates technically feasibility and cost-effectiveness. Mitigation planning grants can be used to help SLTTs update mitigation plans to include a comprehensive range of actions to reduce risk or impact from extreme temperatures.

- Phased projects, available under BRIC, FMA, HMGP and HMGP Post Fire may be used when the subapplicant lacks the technical and financial resources to provide the complete technical information required for a full eligibility or Environmental Planning and Historic Preservation (EHP) review of a complex project. The subapplicant can apply for assistance to develop a complete body of technical data, which may include design (such as mapping heat islands), engineering and EHP feasibility studies or analysis (also referred to as a Phase I study).

Pre-award costs directly related to developing a subapplication that are incurred prior to the date of the grant award may be allowed, subject to FEMA approval at the time of the award. Pre-award costs may be incurred, for example, when gathering data for a National Environmental Policy Act analysis or developing a Benefit-Cost Analysis (BCA), preparing design specifications, or when holding workshops or meetings related to reviewing proposed alternatives and designs.

CAPABILITY- AND CAPACITY-BUILDING

The following assistance strategies, available under BRIC, FMA, HMGP and HMGP Post Fire, can be used to develop mitigation plans and activities:

- Planning
    - To develop or update state, local or tribal hazard mitigation across the country, FEMA funds mitigation planning grants. This assistance provides SLTTs with necessary resources to engage in mitigation planning, bring new partners to the table, update risk assessments based on current projections and develop a comprehensive range of activities to create more resilient communities from extreme weather and other future hazard events.

- Planning-Related Activities
    - To strengthen hazard mitigation across the country, FEMA supports a variety of planning-related activities. This assistance provides flexibility to SLTTs to reduce risk from extreme temperatures and integrate hazard mitigation principles into planning for resilience. This assistance for planning-related activities provides SLTT governments flexibility to further reduce risk and integrate hazard mitigation and resilience principles into

mitigation plans as well as other types of ongoing planning and development activities, such as integration of inclusive partnerships, updating risk and vulnerability assessments, and making land use ordinances and building codes more disaster resilient.

- Project Scoping/Advance Assistance
  - Project scoping/advance assistance are the activities that enable applicants and subapplicants to develop mitigation strategies and obtain data to prioritize, select and develop complete applications in a timely manner. For example, project scoping/advance assistance may be used to identify a vulnerable population, develop a mitigation solution and prepare a subgrant application for extreme temperature mitigation projects. FEMA will accept applications from SLTTs for project scoping/advance assistance. In the application, the SLTT may reflect its intent to ask local communities to perform some of the eligible activities.
- Technical Assistance (Financial and Nonfinancial)
  - Financial technical assistance awards are only available under FMA and allow applicants to maintain a viable FMA program over time. Eligible activities include program promotion, site visits, application development and review, planning and grants management workshops, and staff assistance.
  - Nonfinancial Direct Technical Assistance (DTA) is available under the BRIC grant program to help communities identify their mitigation needs, design transformational projects and help them develop tools needed to successfully apply for resilience funding. Through nonfinancial BRIC DTA, FEMA will provide support for both activity-specific needs and community-wide resilience needs. Refer to the BRIC Direct Technical Assistance web page on FEMA.gov for more information.
- Management Costs
  - FEMA may provide financial assistance to reimburse the recipient and subrecipient for eligible and reasonable indirect costs, direct administrative costs, and other administrative expenses associated with a specific mitigation measure or project. Management costs are not automatically provided or calculated and recipients/subrecipients must include management costs in their subapplications.

Technical Feasibility Considerations

Mitigation projects submitted for funding consideration through our HMA programs must conform with the approved mitigation plan and be both feasible and effective at mitigating the risks of the hazard for which the projects are designed.

In the project narrative, the subapplicant may need to demonstrate the engineering practices, established codes and standards, or modeling applicable to the project. FEMA accepts the engineering design for a project if a stateauthorized professional (for example, licensed professional engineer or architect) certifies that the design meets the appropriate code or industry design and construction standards. FEMA will accept the certified engineering design instead of the FEMA comprehensive technical feasibility review.

- Projects that mitigate extreme heat as a co-benefit while also providing risk reduction from another hazard must demonstrate risk reduction of the primary hazard and should discuss how the project has an additional co-benefit for heat reduction.

- Projects that directly mitigate the loss of life to most at-risk populations must demonstrate, through data and narrative, that the project will be designed and constructed to appropriate standards and support that the project will effectively mitigate the impacts of extreme heat events.

Cost-Effectiveness Considerations

Only cost-effective mitigation measures that conform to the approved Hazard Mitigation Plan are eligible for potential funding from the HMA programs. FEMA created the BCA Toolkit to help applicants perform BCAs and provides pre-calculated benefits that can be applicable in certain scenarios. Pre-calculated ecosystem services benefits can help show these projects to be cost-effective.

- Projects that mitigate extreme heat while also reducing risk from another hazard (e.g., nature-based solutions projects that mitigate flood or wind retrofit projects that mitigate high wind) may be able to demonstrate costeffectiveness using the decreased risk to people, buildings and infrastructure. These projects often rely on the risk reduction benefits of the other hazards to demonstrate cost-effectiveness with the heat islanding reduction serving as a co-benefit that may or may not be directly quantified in the BCA. The BCA would be based on the benefits of the primary mitigation activity. A narrative of heat-islanding reduction should also accompany the BCA to highlight the mitigation benefit of a nature-based solutions compared to grey infrastructure.

- Projects that directly mitigate the loss of life to most at-risk populations may be able to consider the life-safety benefits of the project to demonstrate cost-effectiveness. These projects must clearly identify the at-risk population, the risk to that population by extreme temperatures and the risk reduction of implementing the proposed mitigation action.

Additional Resources

Contact your State Hazard Mitigation Officer or visit FEMA's HMA web page and Hazard Mitigation Planning web page on FEMA.gov for information on HMA and Mitigation Planning programs.

FEMA also provides information about actions that individuals can take to prepare for extreme temperature events:

- Extreme Heat (fema.gov)
- Winter Storm (fema.gov)
- https://www.ready.gov/heat

The National Integrated Heat Health Information System provides heat and health information at HEAT.gov.

The Centers for Disease Control and Prevention (CDC) also has information on the use of cooling centers at:

- Use of Cooling Centers to Prevent Heat-Related Illness: Summary of Evidence and Strategies for Implementation (cdc.gov)

- FACT SHEET: President Biden's Executive Actions on Climate to Address Extreme Heat and Boost Offshore Wind – The White House

A housing development in Menifee is the first in California to be powered with a solar- and battery-powered microgrid. (Photo courtesy of KB Home)

ENVIRONMENT

Menifee is California's first solar- and battery-powered microgrid home community

BY SUSAN CARPENTER | MENIFEE
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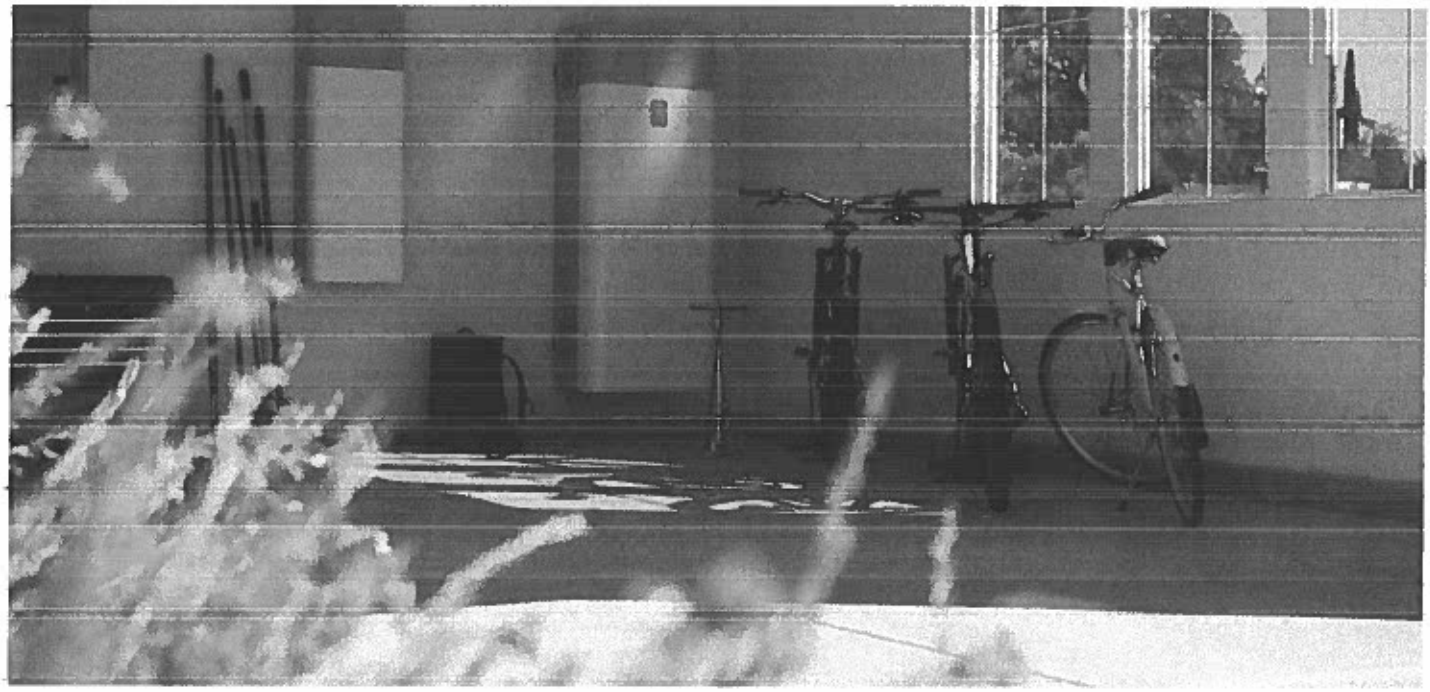
MENIFEE, Calif. — With their taupe exteriors and xeriscaping, the model homes on Hopscotch Drive look like thousands of others in the Inland Empire. But get up close, and visitors will see they aren't mere living quarters. They're a template for resilient living in a future that's increasingly defined by climate change.

SunPower is providing the solar panels for the Menifee microgrid housing development. (Photo courtesy of SunPower)

Throw in an energy-efficient heat pump that powers the heating, air conditioning and water tank, and gas-free appliances for the kitchen and laundry rooms, and "these homes are, on average, about 40% more efficient overall than your standard home in California," said Scott Hansen, vice president of forward planning for KB Home.

KB Home partnered with solar provider SunPower last year to apply for a Department of Energy grant on the 219-home development in Menifee, about 65 miles east of Los Angeles. In 2020, the DOE said it would provide up to $65 million to fund new housing projects as part of a connected communities initiative to accelerate renewable energy adoption and grid resilience.



SunPower is providing the battery storage system for the Menifee microgrid community. (Photo courtesy of SunPower)

LA-based KB Home and SunPower, headquartered in San Jose, received $6.6 million from the agency to pay for the microgrid's batteries and research that the University of California-Irvine and the Lawrence Berkeley National Lab will conduct. The car company Kia and the Southern California Edison power utility are also partners in the project.

"How can we get this to work? How does it work? What's the best way to run it? What's the best way to operate it? What's the best way to build it so that we can, in our future communities, take what we learn here and implement it in other places?" Hansen said. "That's the purpose of the grant."

The nation's sixth largest home builder, KB selected the Menifee development because it was large enough to be a good experiment and could also be isolated from the main electricity grid in the event of a power outage or natural disaster, Hansen said.

KB Home is building the houses in the Menifee microgrid community. (Photo courtesy of KB Home)

The homes are available in a variety of floor plans and range in price from $490,000 to $590,000. Each house ranges in size from 1,400 to 2,900 square feet, which determines the scale of its solar array and battery system. Whether a homeowner is able to completely power their space with solar, however, depends on their usage.

Residents who are frugal with their electricity use might not need to pull any power from Southern California Edison, though people who are heavy electronics users most likely will, Hansen said.

"If I asked most people, 'What do you want in your electricity provider?' They'd say they want low cost or affordable, reliable energy," said Matt Brost, vice president of new home sales for SunPower, which is providing the solar panels, battery energy storage, management system and installation for the microgrid homes.

"With this project, we've got even lower cost, super reliable energy, but on top of it, you're getting all these other benefits like resiliency."

KB Home is building the houses in the Menifee microgrid community. (Photo courtesy of KB Home)

The homes are resilient because the electricity is locally generated with solar panels and stored on site, not only with individual homes' batteries but a large community battery that can store their excess power. What makes them a microgrid is that all of the homes are connected to each other and pool their power into an energy island that's able to provide backup power in case of an impending blackout.

Already, a grueling week-long heat wave in September brought the state to the brink of mass blackouts. As climate change leads to more extreme heat events that prompt California residents to crank their air conditioning and max out the grid, the need for resiliency is increasingly imperative.

With their SunPower systems, homeowners will pay 10% less for electricity than they would from SoCal Edison and have the same electricity rate for the next 25 years, Brost said. Homeowners who take part in the company's virtual power plant program will also be able to make money off their systems by selling energy back to the grid in times of peak demand.

"The beauty is they have charged their battery with the sun and they discharge it during peak rates where they can make even more money with the utility," Brost said.

Kia is a partner in the Menifee microgrid community. (Photo courtesy of Kia)

"We've got these people who are interested in these very efficient homes. They're probably looking at efficient transportation, and we want to be a part of that story," said James Bell, head of corporate communications for Kia, whose North American headquarters are in Irvine.

Kia is partnering with KB Home to offer a discount on its battery-electric EV6 crossover to customers who buy one of the Menifee microgrid properties. The exact discount has not yet been decided but is likely to be $2,000 to $3,000, Bell said. The list price of a new 2022 EV6 is currently $40,900.

"This is a pivot kind of moment," Bell said, comparing the transition to electrification with the transition from horse-drawn carriages to gas-powered cars a century ago. "That didn't happen overnight. We're kind of in that same phase here with not only electrified transportation but the entire infrastructure that supports that. We're standing on the future right now. No doubt."

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