ENERGY RESILIENCE: DECENTRALIZING ENERGY INFRASTRUCTURE TO COMBAT THE EFFECTS OF THE CLIMATE CRISIS ON LOUISIANA

*Zachary D. Berryman**

After Hurricane Katrina ravaged the Louisiana coast in 2005, residents were hung out to dry and left in the dark for forty days. In 2020, Hurricane Laura left much of southwest Louisiana in the dark for three weeks. Then in 2022, over one million people in southeast Louisiana lost power following Hurricane Ida, the majority of whom had their power restored in around fifteen days, but for some it would take over a month. This pattern remains unbroken despite its predictability. Power disruption after these summer storms is not just a mere inconvenience, but an issue of public health and safety. While residents wait for the lights to turn back on, they are unable to escape the heat and humidity, leading to many unnecessary and preventable deaths from heat exhaustion or carbon monoxide poisoning from portable generators. These storms are becoming more frequent and more intense due to the climate crisis, but little has been done to fortify Louisiana's energy infrastructure in response. It is clear that the current power grid model is not sustainable for the coast of Louisiana, so the question becomes: What can be done?

The Infrastructure Investment and Jobs Act (IIJR), signed into law by President Biden in November 2021, specifically addresses "Grid Infrastructure and Resiliency." Five billion dollars in grants that could fund the construction of decentralized standalone microgrids are made available through this Act. Then, in August of 2022, President Biden signed the Inflation Reduction Act (IRA),

* Law Clerk, United States District Court for the Eastern District of Louisiana, 2022–2023; LL.M. Candidate at Loyola University New Orleans College of Law; J.D., Loyola University New Orleans College of Law; B.A., Louisiana State University. The Author wishes to thank the editors of the Loyola Law Review for their thoughtful comments during the entire editing process, and the often-overlooked members and candidates for their hard work and contributions to the publication of this piece.

which has the potential to cut the cost of microgrids by 10–50% through tax incentives and will further facilitate their construction. Together, the IIJA and the IRA could allow more development of rooftop community solar microgrids in furtherance of establishing energy resilience for vulnerable communities in the face of the climate crisis.

Moving past the traditional grid model would prevent a repeat of what happened in the wake of Hurricane Ida, where the collapse of a transmission tower and the failure of the few remaining transmission lines left the entirety of the City of New Orleans without power. By decentralizing power, more residents and individual communities would maintain access to power during these devastating storms and achieve faster power restoration in the event of power disruption.

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INTRODUCTION

In grade school, children around the globe are taught the four seasons: summer, fall, winter, and spring. However, children growing up in Louisiana learn of a fifth season: hurricane season. Unlike the traditional four, hurricane season spans half of the

year, from June 1 to November 30,[1] and brings with it destruction that plunges affected areas into darkness.

Power outages can last for days, weeks, and for some, even months, causing horrible public health and safety crises. Even though Louisiana has a long history of dealing with hurricanes and their devastating effects on the energy grid system, little has been done in the way of upgrading the grid to be more resilient. In fact, as the storms grow stronger and more frequent, the grid has largely remained the same, relying predominately on power generated a great distance from the final user, creating many vulnerabilities that are consistently exploited by major weather events.

While power restoration takes place throughout cities after these storms, members of marginalized communities are often the last to see the lights come back on and are typically without the means to evacuate for extended periods of time, if at all. Although these storms do not discriminate based on sex, race, or religion, history shows that these storms have discriminatory effects and disparately affect marginalized communities. Before hurricanes even make landfall, these communities are frequently subject to systemic hardships. They are often located in higher-risk areas with less access to storm-resistant infrastructure than their White counterparts, resulting in even greater disproportionate effects in the wake of these storms. Energy security in the wake of extreme weather events is non-existent for marginalized communities, and little is being done to truly prepare and create a more resilient energy grid that can compete with the climate crisis.

To combat the climate crisis and its resulting storms, Louisiana must decentralize its energy infrastructure and focus on energy production closer to the end user. This was made clear after the massive failure of the whole grid system of New Orleans following Hurricane Ida. The New Orleans energy provider, Entergy, should recognize from Hurricane Ida that the old system of centralized energy operating on a singular grid no longer works in today's world. By creating and implementing rooftop community solar microgrids in New Orleans, Entergy can create a resilient grid system that will be able to better withstand extreme weather events. In the event of power disruptions, they will allow

1. *See generally Tropical Cyclone Climatology*, NAT'L HURRICANE CTR. & CENT. PAC. HURRICANE CTR., https://www.nhc.noaa.gov/climo/ (last visited Nov. 13, 2022) (describing the nature of Atlantic hurricane season).

for faster power restoration, reducing the negative effects on public health and safety that are disproportionately experienced by marginalized communities. However, implementing rooftop community solar microgrids in New Orleans will not come without a cost. Entergy is urged to look to the federal Infrastructure Investment and Jobs Act (IIJA) for funding, as well as to the Inflation Reduction Act of 2022 (IRA) for further incentives such as tax credits and loans in order to complete this energy resilience project. Together, the IIJA and the IRA can be used to combat the effects of the climate crisis on accessible and reliable energy in Louisiana by supporting decentralization of power through promoting the creation and implementation of rooftop community solar microgrids.

This Article will explore recently passed federal legislation that can be utilized to facilitate the installation of technology that will increase energy resilience in Louisiana. Part I will discuss the effects of the climate crisis on Louisiana and the current state of energy infrastructure in the state. Part II will provide a general background on community solar and microgrid technologies and will introduce the proposal of using rooftop community solar microgrids as a method of decentralizing energy infrastructure to achieve a more resilient and reliable power grid. Part III will discuss the IIJA and the IRA and how the Acts can be utilized by Entergy to implement rooftop community solar microgrids in New Orleans.

I. THE CLIMATE CRISIS AND THE CURRENT STATE OF ENERGY RESILIENCE IN LOUISIANA

The global climate crisis has brought about an increased frequency and intensity of major weather events such as hurricanes.[2] Those of us who live in the "cone of uncertainty"[3] are

2. *Extreme Weather and Climate Change*, C2ES: CTR. FOR CLIMATE CHANGE & SOLS., https://www.c2es.org/content/extreme-weather-and-climate-change (last visited Feb. 24, 2023); *Hurricanes and Climate Change*, C2ES: CTR. FOR CLIMATE CHANGE & SOLS., https://www.c2es.org/content/hurricanes-and-climate-change (last visited Feb. 24, 2023).

3. The "cone of uncertainty" refers to the cone-shaped forecast map of the projected path of a tropical system such as a hurricane. *See Cone of Uncertainty: Facts and Myths About This Tropical Forecasting Tool*, WEATHER UNDERGROUND (May 14, 2022), https://www.wunderground.com/article/science/weather-explainers/news/2022-05-12-cone-of-uncertainty-facts-and-myths-about-this-tropical; *see also* Kyle Whitfield, *This graphic shows exactly why Louisiana is fed up with hurricane season*, NOLA.COM (Oct. 25, 2020, 8:18 AM), https://www.nola.com/article_d9697294-16c1-11eb-abb3-

all too familiar with the annual routine of stocking up on canned goods, gasoline, and most importantly, batteries. If a hurricane makes landfall in Louisiana, it is almost a guarantee that the power will inevitably go out, and there will be little indication of when it will return. This section will first explore the state of the Louisiana electricity grid that leads to this energy insecurity when facing hurricanes, then it will consider Hurricane Ida as a case study on the New Orleans power grid, and finally this section will outline how these major weather events have a disparate impact on vulnerable and marginalized communities.

A. THE DARK STATE OF THE COASTAL LOUISIANA GRID

Louisiana is no stranger to hurricanes, but the true devastation potential of these storms was brought to the national stage in 2005 when Hurricane Katrina leveled Louisiana, becoming the costliest natural disaster in United States history.[4] Hurricane Katrina brought the lively city of New Orleans to a screeching halt and plunged it into darkness. For as long as forty-two days, the static hum from overhead power lines could not be heard around coastal Louisiana.[5] Shortly thereafter, the damage caused by Hurricane Rita took workers three weeks to completely restore power along the coast.[6]

2737fc665d10.html (stating that at the time of the article's publication, Louisiana had been in the cone of uncertainty for a total of three weeks during the year 2020 and providing a graphic depicting Louisiana as the state that spent the most time in the cone of uncertainty for that year); Dan Swenson, *With Tropical Storm Eta, Louisiana's been in 'cone of uncertainty' 8 times this hurricane season*, NOLA.COM (Nov. 10, 2020, 6:48 AM), https://www.nola.com/article_1ffefce4-203e-11eb-b971-d35c474a0aa9.html (depicting all eight cones of uncertainty for hurricanes that threatened Louisiana in 2020).

4. *See* David Muhlbaum, *The Most Expensive Natural Disaster in U.S. History*, KIPLINGER (Oct. 11, 2022), https://www.kiplinger.com/slideshow/business/t019-s001-most-expensive-natural-disasters-in-u-s-history/index.html; *Costliest U.S. Tropical Cyclones*, NAT'L CTR. FOR ENVT. INFO, (Oct. 11, 2022), https://www.ncei.noaa.gov/access/billions/dcmi.pdf (stating the adjusted cost of Hurricane Katrina to be $190 billion).

5. *See* Lee Sebatini, *Entergy Louisiana's Katrina and Rita Restoration Costs Are Paid in Full*, ENTERGY (Aug. 1, 2018), https://www.entergynewsroom.com/news/entergy-louisianakatrina-rita-restoration-costs-are-paid-full/.

6. *See id.; see also Infrastructure Failure - Power Outage*, NOLA READY: HAZARD MITIGATION PLAN, https://ready.nola.gov/hazard-mitigation/hazards/infrastructure-failure-power-outage/ (last visited Mar. 9, 2023) (displaying a chart titled "Entergy-Wide Restoration of Customer Outages vs. Time for Major Hurricanes," which compared the number of power outages and the restoration time period for Hurricanes Katrina (2005), Rita (2005), Gustav (2008), Ike (2008), and Isaac (2012)).

On August 27, 2020, Hurricane Laura fell on southwest Louisiana,[7] causing over 400,000 outages that would take over a month to completely restore.[8] However, the lights did not stay on long; two weeks after restoration was complete, Hurricane Delta came through the same area, plunging the region into darkness once again.[9] Although restoration crews were able to move fast and restore power within the week,[10] on October 28, 2020, Hurricane Zeta hit the Louisiana coast, again knocking out power to very frustrated residents.[11] Lights came back on within days for most customers, but for some, restoration would take over two weeks.[12] From August to November of 2020, residents of coastal Louisiana were without reliable access to power, unsure of when the lights would be on, and for how long.

Despite storms consistently crippling a flawed system, nothing changed. The next major hurricane exposed just how flawed the system was. Almost a year later, on August 29, 2021, Hurricane Ida made landfall in southern Louisiana as a category four hurricane.[13] In her wake, Hurricane Ida left over one million

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7. *See Hurricane Laura the First Southwest Louisiana Category 4 Landfall on Record With Destructive Winds, Storm Surge*, WEATHER CHANNEL (May 28, 2021), https://weather.com/storms/hurricane/news/2020-08-28-hurricane-laura-recap-louisiana-category-4-landfall.

8. *See Sophie Kasakove, Three Weeks After Hurricane Ida, Parts of Southeast Louisiana Are Still Dark,* N.Y. TIMES (Sept. 18, 2021), https://www.nytimes.com/2021/09/18/us/ida-louisiana-power-outages.html; *see also* Rania Kaur, *Entergy Louisiana: power restoration for Hurricane Laura largest in company's history*, KPLC (Sept. 11, 2020, 7:01 PM), https://www.kplctv.com/2020/09/11/entergy-louisiana-power-restoration-hurricane-laura-largest-companys-history/ (noting that Hurricane Laura resulted in the largest restoration effort by Entergy Louisiana, the local energy provider, which originally estimated the restoration efforts would take four to six weeks).

9. David Freese & Brandon Scardigli, *Entergy Louisiana Restores Power to All Customers Following Hurricane Delta*, ENTERGY (Oct. 17, 2020), https://www.entergynewsroom.com/news/entergy-louisiana-restores-power-all-customers-following-hurricane-delta/.

10. *See id*.

11. *Id.*

12. *See id*.

13. *Hurricane Ida*, NAT'L WEATHER SERV., https://www.weather.gov/lch/2021Ida (last visited Nov. 20, 2022).

people without power,[14] including the entire city of New Orleans.[15] While much of Louisiana had its power restored within fifteen days,[16] some areas did not see lights for weeks,[17] and for the most affected areas permanent power restoration took months.[18]

Why do extended blackouts following hurricanes continue to happen in Louisiana? Though the answer could have been deduced by investigating the power failures from Hurricanes Katrina, Rita, Laura, Delta, or Zeta, Hurricane Ida made the answer abundantly clear: the power grid.[19] First, it is important to define the term "power grid." Power grid refers to the infrastructure utilized to transmit and distribute electricity from power plants where the electricity is generated to individual people at homes and businesses where it is consumed.[20] Without discussing the complex intricacies of the entirety of the grid system, at its most basic level, power plants generate electricity, which then moves to a substation where transformers step up the voltage for transmission.[21] High-voltage transmission lines then carry the electricity long distances to substations where transformers step down the voltage before low-voltage distribution lines carry the electricity to distribution transformers (often mounted on poles).[22]

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14. *See* Arelis R. Hernández, *Lights Out: Living without power in the wake of Hurricane Ida*, WASH. POST. (Sept. 24, 2021), https://www.washingtonpost.com/nation/interactive/2021/hurricane-ida-no-power/.

15. *See* Mykal Vincent, *Major electrical tower collapse leaves New Orleans completely without power*, WAFB9 (Aug. 29, 2021, 10:56 PM), https://www.wafb.com/2021/08/30/no-power-orleans-parish-due-catastrophic-damage/.

16. *See Entergy: Power restored to 90 percent of Louisiana 15 days after Hurricane Ida*, WDSU (Sept. 14, 2021, 11:08 AM), https://www.wdsu.com/article/new-orleans-entergy-power-outages-ida/37592866.

17. *See* Hernández, *supra* note 14; *see Kasakove*, *supra* note 8.

18. *See* Chad Calder, *Months after Hurricane Ida, Grand Isle has permanent power restored: 'We're going to come back'*, NOLA.COM (Jan. 18, 2022, 6:12 PM), https://www.nola.com/article_7f6d3062-7874-11ec-8f34-e3c740860dda.html (power restoration efforts in Grand Isle, Louisiana, took over four months to complete).

19. *See* Antonia Juhasz, *To keep the lights on, New Orleans' grid needs to change—here's how*, NAT'L GEOGRAPHIC: ENV'T (Sept. 8, 2021), https://www.nationalgeographic.com/environment/article/to-keep-the-lights-on-new-orleans-grid-needs-to-change-here-is-how (the infrastructure for the current energy transmission system "is inherently vulnerable to storms, particularly when needed upkeep isn't performed.").

20. *See Electricity explained: How electricity is delivered to customers*, U.S. ENERGY INFO. ADMIN. (Aug. 11, 2022), https://www.eia.gov/energyexplained/electricity/delivery-to-consumers.php.

21. *See generally id.*

22. *See id.*; *see also* Univ. of Calgary, *Distribution transformer*, ENERGY EDUC., https://energyeducation.ca/encyclopedia/Distribution_transformer (last visited Mar. 3, 2023).

These step down the voltage one last time before it enters homes and businesses.[23] In order for the lights to come on when the switch is flipped, every single step must be functioning correctly.

B. HURRICANE IDA AS A CASE STUDY ON THE NEW ORLEANS GRID

New Orleans relies on eight transmission lines to bring electricity to various substations for distribution throughout the city.[24] Hurricane Ida managed to destroy all eight transmission lines into the city, creating a completely blacked out "island" without power.[25] Even if a single transmission line had withstood the storm, power distribution would have been minimal. Thirty-one thousand low-voltage distribution lines were destroyed by Hurricane Ida, nearly twice as many as were destroyed by Hurricane Katrina.[26] Even structures that withstood the winds of Hurricane Katrina were leveled by Hurricane Ida.[27] Although recent transmission lines and energy infrastructure are built to withstand 140-mph winds or greater, much of the existing infrastructure and existing lines were constructed to withstand only a fraction of that speed.[28] Energy providers are not moving—and possibly cannot move—fast enough to upgrade and replace the current grid infrastructure to withstand the growing intensity of hurricanes.[29]

However, with the growing intensity and frequency of these major storms, is the current grid system even worth upgrading and replacing? Louisiana ranks among the least reliable grids in the

23. *See* Univ. of Calgary, *supra* note 22.

24. *See* Carlie Kollath Wells, *Entergy transmission line that brings power to New Orleans fixed a year after Ida toppled it*, NOLA.COM (Aug. 24, 2022, 4:31 PM), https://www.nola.com/article_33428e26-23c8-11ed-8c3f-4390591dabc1.amp.html.

25. *See id*.

26. *See* Peter Eavis & Ivan Penn, *Why Louisiana's Electric Grid Failed in Hurricane Ida*, N.Y. TIMES (Sept. 17, 2021), https://www.nytimes.com/2021/09/17/business/energy-environment/hurricane-ida-entergy-power-outage-new-orleans.html.

27. *See* Rebecca Santana & Jay Reeves, *Hurricane Ida traps Louisianans, shatters the power grid*, AP: NEWS (Aug. 30, 2021), https://apnews.com/article/hurricane-ida-louisiana-new-orleans-c43c2c68946ceb6100c2239534c6c290.

28. *See* Eavis & Penn, *supra* note 26.

29. *See id*.; Tim Mclaughlin & Stephanie Kelly, *Why Hurricane Ida crippled the New Orleans power grid*, REUTERS: ENV'T (Sept. 4, 2021, 9:02 AM), https://www.reuters.com/business/environment/why-hurricane-ida-crippled-new-orleans-power-grid-2021-09-04/.

nation, even after adjusting for these major storms.[30] The average duration of a given power interruption is measured on the System Average Interruption Duration Index (SAIDI), which found that the average duration of non-momentary power interruptions in Louisiana not attributable to major storms was 216.4 minutes in 2020 and 228.2 minutes in 2021.[31] When major storms are factored in, Louisiana becomes the state with the highest duration of non-momentary power interruptions, leading 2020 with 3,624.4 minutes (over sixty hours) and 2021 with 4,811.1 minutes (over eighty hours).[32] In 2020, the national average when major events were factored in was eight hours of power interruptions, and in 2021, about seven hours.[33] When Louisiana is taken out of the equation, the average annual time of non-momentary power interruptions in 2021 dropped to around six hours.[34] This is a prime illustration of Louisiana being the extreme outlier where access to reliable energy is concerned. For instance, hardening Louisiana's grid by upgrading the current infrastructure with equipment meant to withstand faster winds will not fix the glaring problem of New Orleans's energy bottleneck created by the eight transmission lines.[35] How much hardening is necessary to prevent another city-wide blackout due to these energy bottlenecks? Storms are growing increasingly more frequent and intense. Simply upgrading infrastructure to withstand faster winds is not the answer: The energy bottleneck needs to be eliminated.[36]

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30. *See* Sam Karlin, *Louisiana has struggled to get electric grid aid. See why that could soon change.*, THE ADVOCATE (Oct. 31, 2021), https://www.theadvocate.com/article_7cd0e8e4-5721-11ed-8652-0bf34b99ca38.html.

31. *See Table 11.3 Reliability Metrics Using Any Method of U.S. Distribution System by State, 2021 and 2020*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/electricity/annual/html/epa_11_03.html (last visited Nov. 20, 2022); Anodyne Lindstrom & Sara Hoff, *U.S. electricity customers experienced eight hours of power interruptions in 2020*, U.S. ENERGY INFO. ADMIN. (Nov. 10, 2021), https://www.eia.gov/todayinenergy/detail.php?id=50316; Rosalyn Berry, *U.S. electricity customers averaged seven hours of power interruptions in 2021*, U.S. ENERGY INFO. ADMIN. (Nov. 14, 2022), https://www.eia.gov/todayinenergy/detail.php?id=54639.

32. *See Table 11.3 Reliability Metrics Using Any Method of U.S. Distribution System by State, 2021 and 2020*, *supra* note 31; Lindstrom, *supra* note 31; Berry, *supra* note 31.

33. Lindstrom, *supra* note 31; Berry, *supra* note 31.

34. Calculations based on the raw data yielded 345.29 minutes for 2021. *See Table 11.3 Reliability Metrics Using Any Method of U.S. Distribution System by State, 2021 and 2020*, *supra* note 31.

35. *See* Mclaughlin & Kelly, *supra* note 29.

36. *See* Elisa Wood, *How Many Hurricanes Must Slam the Grid Before We Get the Message?,* MICROGRID KNOWLEDGE (Sept. 3, 2021), https://www.microgridknowledge.

In a broad effort to generate power from within New Orleans's energy island, in 2019 the New Orleans City Council approved Entergy's "New Orleans Power Station" (NOPS), a $210 million natural gas power plant capable of producing 128 megawatts in New Orleans East.[37] Though the facility would not be able to generate power for the whole city, which would require around 1,100 megawatts,[38] the goal was to "send electricity to hospitals, nursing homes and at least some of the neighborhoods sweltering through the aftermath of a powerful summer storm."[39] One of the appealing features of the proposed NOPS was its "black start" capability. This means that when the station is entirely offline—with no outside power to support it from the eight outside transmission lines—NOPS has the ability to fire up on its own and transmit power to the city.[40] However, in the wake of Hurricane Ida, NOPS remained dark.[41] According to Entergy, the plant was fully capable of the black start, but the company decided against it and instead opted to focus on restoring one of the damaged transmission lines coming into the city from suburban Slidell,

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com/editors-choice/article/11427757/how-many-hurricanes-must-slam-the-grid-before-we-get-the-message.

37. *See* New Orleans Editorial Team, *New Orleans Power Station: An Important Resource in the Ida Restoration Process*, ENTERGY (Sept. 2, 2021), https://www.entergynewsroom.com/article/new-orleans-power-station-important-resource-in-ida-restoration-process/; David Hammer, *An island without power: Why a massive Entergy transmission tower crumbled and all 8 sources of outside power were lost*, WWL (Aug. 30, 2021, 10:06 PM), https://www.wwltv.com/article/news/investigations/289-bc36e2e4-b19e-4bf0-af3f-97c25f44460f; Sophie Kasakove & Nicholas Bogel-Burroughs, *New Orleans Built a Power Plant to Prepare for Storms. It Sat Dark for 2 Days.*, N.Y. TIMES (updated Sept. 18, 2021), https://www.nytimes.com/2021/09/10/us/ida-new-orleans-power.html; *Our Views: Remember that agitation against a New Orleans power plant? Glad we have it now*, THE ADVOCATE (Sept. 7, 2021), https://www.theadvocate.com/article_18da09e0-0c38-11ec-afe2-3b80a7f9383f.html (discussing the very contentious approval of NOPS in 2018, which was then reaffirmed in 2019, leading to NOPS completion in 2020); David Hammer, *Entergy NO CEO: New power plant could get electricity back to hospitals in 3 days, 'God willing.'*, WWL (Aug. 31, 2021, 5:55 PM), https://www.wwltv.com/article/news/investigations/289-97565961-85d6-4079-b07e-2a367e56726e.

38. Hammer, *supra* note 37.

39. *See* Kasakove & Bogel-Burroughs, *supra* note 37; *see also Frequently Asked Questions About New Orleans Power Station*, ENTERGY, https://www.entergy.com/brightfuturenola/nopsfaq/ (NOPS has a theoretical capability of powering approximately 80,000 residences) (last visited Nov. 25, 2021).

40. *See Frequently Asked Questions About New Orleans Power Station*, *supra* note 39; Hammer, *supra* note 37; Jon Schuppe & Daniella Silva, *New Orleans 'black start' plant, built to withstand natural disasters, under scrutiny*, YAHOO! (Sept. 7, 2021), https://www.yahoo.com/now/slow-return-power-raises-questions-181700695.html

41. *See* Kasakove & Bogel-Burroughs, *supra* note 37.

Louisiana.[42] Entergy contends that a premature black start would have been dangerous and could have destroyed NOPS, but the company says it was nonetheless within the station's capability.[43] However, after footing the bill for NOPS on the promise of rapid power restoration following extreme storms,[44] residents left in the dark for weeks were not the most trusting of Entergy's assurances. The situation ultimately culminated in lawsuits against the energy provider.[45]

C. THE DISPARATE IMPACT OF MAJOR WEATHER EVENTS

Persistent outages promulgated by hurricanes are more than just mere inconveniences for Louisiana residents; they are public health crises that prove to be deadly. Power outages affect not only light switches, but also refrigeration, life-saving medical devices, and air conditioning.[46] Food inside refrigerators must all be thrown out and residents need cash on hand to buy non-perishable

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42. *See id*.

43. *See Frequently Asked Questions About New Orleans Power Station*, *supra* note 39.

44. It is worth knowing that NOPS approval was not without scandal. An independent investigation yielded that Entergy paid actors to speak in support of the proposed facility during the City Council public comment period on the matter. The result was a $5 million fine on Entergy and ultimate approval of NOPS. *See* Hanna Krueger, *Investigators confirm Entergy paid actors to speak in support of the power plant: report*, NOLA.COM (Oct. 30, 2018, 2:18 AM), https://www.nola.com/article_5daaec46-4c72-56a1-962f-d571f4f64136.html; Caresse Jackman, *Council: $5 million fine, better service and ethics training for Entergy following 'Astroturfing' scandal*, WWL (Feb. 13, 2019, 12:17 PM), https://www.wwltv.com/article/news/local/289-d4002865-9e0a-4204-9a70-9a66e9a46650; David Hammer, *Entergy's shifting explanation on why new plant didn't generate power*, WWL (Sept. 2, 2021, 6:46 PM), https://www.wwltv.com/article/news/investigations/289-efa8b98f-80cc-4fbb-806d-74caa2163ec5.

45. *See* Max Blau et al., *Entergy Resisted Upgrading New Orleans' Power Grid. Residents Paid The Price*, NPR (Sept. 22, 2021), https://www.npr.org/2021/09/22/1039110522/entergy-resisted-upgrading-new-orleans-power-grid-residents-paid-the-price ("[E]xecutive director of the Alliance for Affordable Energy[] said New Orleanians must learn why the plant failed at the very moment it was supposed to be used," and stated that the City Council must hold Entergy accountable for its promises made in connection to NOPS.); *see also* Original Class Action Petition for Damages and Jury Trial Request, Stewart v. Entergy Corp., No. 2021-07365 (Civ. Dist. Ct. Par. of Orleans Sept. 18, 2021), http://climatecasechart.com/wp-content/uploads/sites/16/case-documents/2021/20210918_docket-2021-07365_complaint.pdf (detailing class action lawsuit residents filed in the wake of Hurricane Ida against Entergy and its subsidiaries).

46. *See Health Hazards After a Hurricane*, VISUALDX (Sept. 30, 2022), https://www.visualdx.com/blog/health-hazards-after-a-hurricane/.

goods because credit card machines are down.[47] Medical devices such as "oxygen machines, medication nebulizers, home dialysis, infusion pumps, and electric wheelchairs . . . all depend on a reliable power supply," and when "the power is out, and medical devices are failing, the next stop is often a nearby hospital."[48] Though air conditioning may seem like a luxury, it can be the difference between life and death when trying to escape brutal heat, and when the power goes out, vulnerable populations are at a heightened risk of developing heat-related complications, including death.[49] According to meteorologist Jonathan Belles, "The combination of a lack of air conditioning, lack of shelter and warming temperatures following a hurricane creates a stressful and sometimes deadly situation."[50]

To beat the heat or charge necessary devices, those with access turn to portable generators. However, far too often these too turn out to be deadly.[51] In the instance of Hurricane Laura, the storm itself caused fewer deaths than carbon monoxide poisoning resulting from improper use of portable generators.[52] The aftermath of these storms, the recovery period, and the extensive power outages are responsible for almost half of the deaths associated with hurricanes.[53]

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47. *Id*.

48. Charlotte Huff, *Growing Power Outages Pose Grave Threat To People Who Need Medical Equipment To Live*, NPR: WWNO (May 15, 2021, 7:01 AM), https://www.npr.org/sections/health-shots/2021/05/15/996872685/growing-power-outages-pose-grave-threat-to-people-who-need-medical-equipment-to-.

49. *See* Jan Wesner Childs, *Heat Is Biggest Killer in Louisiana After Hurricane Ida*, WEATHER CHANNEL (Sept. 9, 2021), https://weather.com/news/news/2021-09-09-heat-hurricane-ida-new-orleans-louisiana-power-outages ("Anyone can be susceptible to heat exhaustion or heat stroke, but the elderly, infants and children are particularly vulnerable. Those who died of excessive heat after Hurricane Ida were all older people, ranging in age from 64 to 79.").

50. *Id*. (internal quotations omitted).

51. *See* Rachel Treisman, *Majority Of Hurricane Laura Deaths Linked To Improper Use Of Portable Generators*, NPR: WWNO (Sept. 1, 2020, 9:45 PM), https://www.npr.org/2020/09/01/908515238/majority-of-hurricane-laura-deaths-linked-to-improper-use-of-portable-generators; *see also Carbon Monoxide Poisonings After Two Major Hurricanes — Alabama and Texas, August–October 2005*, 55 MORBIDITY & MORTALITY WEEKLY REP. 236 (2006) (discussing carbon monoxide poisoning resulting from portable generator usage following hurricanes); *Carbon Monoxide Poisoning from Hurricane-Associated Use of Portable Generators — Florida, 2004*, 54 MORBIDITY & MORTALITY WEEKLY REP. 697 (2005) (same).

52. *See* Treisman, *supra* note 51.

53. *See* Greg Allen, *A New Hurricane Season Brings A New Threat: Carbon Monoxide Poisoning*, NPR: WWNO (Jan. 1, 2021, 5:00 AM), https://www.npr.org/2021/06/01/1000203891/a-new-hurricane-season-brings-a-new-threat-carbon-

Whereas these extreme weather events themselves are inherently nondiscriminatory in their destruction, often leaving a whole city without power, the effects of hurricanes like that of Hurricane Ida disparately impact Black and other minority communities.[54] Specifically, hurricanes exploit "systemic economic inequities that leave these communities with less access to health care, disaster insurance, the resources needed for a safe evacuation, and a lack of robust, storm-proof, and modernized infrastructure resistant to flooding and hurricane-force winds."[55] One of the first major hurdles is the ability to evacuate, which becomes increasingly difficult without access to a private vehicle. Nationally, only 7% of White households do not own personal vehicles; while 24% of Black households, 17% of Latinx households, and 13% of Asian-American households do not own personal vehicles.[56] "Disaster evacuation plans across the nation assume that people own a car," and when this assumption is challenged by reality, marginalized and vulnerable populations are literally left behind to shelter in place.[57] Racially discriminatory housing

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monoxide-poisoning (recording from the deputy director of the National Hurricane Center, Ed Rappaport, that indirect causes "such as heart attacks, vehicle accidents, electrocution and carbon monoxide . . . were responsible for almost half of hurricane deaths"). For further discussion on the health impacts in the aftermath of hurricanes see generally, Mary Brandt et al., *Mold Prevention Strategies and Possible Health Effects in the Aftermath of Hurricanes and Major Floods*, 55 CTRS. FOR DISEASE CONTROL & PREVENTION, no. 8, 2008, at 12–20 (discussing health effects of fungi exposure associated with hurricanes).

54. *See* Elana Knopp, *Environmental Injustice: Hurricane Ida's impact on Black and Brown communities tells a story of racial disparities around climate change*, EDISON: ENERGY (Jan. 24, 2022), https://www.edisonenergy.com/blog/environmental-injustice-hurricane-idas-impact-on-black-and-brown-communities-tells-a-story-of-racial-disparities-around-climate-change/; Bilal G. Morris, *Hurricanes 'Disproportionately' Harm Black Neighborhoods—It's Because Of Environmental Racism*, NEWSONE (Sept. 28, 2022), https://newsone.com/4417897/hurricanes-environmental-racism/; *see generally* Robert D. Bullard, *Differential Vulnerabilities: Environmental and Economic Inequality and Government Response to Unnatural Disasters*, 75 SOC. RSCH. 753 (2008) ("Although both black and white hurricane survivors find themselves in similar circumstances (displacement from their homes), blacks, because of institutional discrimination, may face different experiences and challenges than whites in rebuilding their lives, homes, businesses, institutions, and communities.").

55. *See* Sofia Andrade, *Hurricanes Are Not Your Great Equalizer*, HARV. POL. REV. (Oct. 13, 2020), https://harvardpolitics.com/hurricanes-are-not-your-great-equalizer/.

56. Bullard, *supra* note 54.

57. *See id*. (discussing how the Katrina evacuation plan worked well for individuals with access to vehicles but failed those who depend on public transportation, which equated to around 15% of New Orleans' total residents and one-third of New Orleans' Black residents).

practices combined with "red-lining" have historically placed marginalized populations in areas with a greater risk of flooding.[58] Combining their location within higher-risk areas with their lack of access to resilient, storm-resistant building material and infrastructure, marginalized communities can experience greater damage than their White counterparts.[59]

In the wake of the destruction, marginalized and vulnerable communities are also slower to recover and have less access to recovery aid.[60] There are several recent studies that demonstrate the inequity experienced by marginalized communities when it comes to recovery aid for similar losses.[61] Whereas disasters on average result in a wealth decrease by $27,000 for Black survivors, their White counterparts see an average increase of $126,000.[62] This is in part due to "complex systemic factors, like a real estate market that often places higher values on properties in communities with many white residents, or the difficulty of navigating the federal bureaucracy, which tends to favor people and communities that have more resources from the beginning."[63] However, this is no secret; FEMA's own internal analysis shows

58. *See* Gary Rivlin, *White New Orleans Has Recovered from Hurricane Katrina. Black New Orleans Has Not.*, TALK POVERTY (Aug. 29, 2016), https://talkpoverty.org/2016/08/29/white-new-orleans-recovered-hurricane-katrina-black-new-orleans-not/; Morris, *supra* note 54.

59. *See, e.g.*, John R. Logan et al., *Trapped in Place? Segmented Resilience to Hurricanes in the Gulf Coast, 1970–2005*, 53 DEMOGRAPHY 1511, 1514 (2016); Oliver Laughland, *He 'put everything' into his Louisiana home. Hurricane Ida destroyed it in one day.*, THE GUARDIAN (Sept. 9, 2021, 2:00 PM), https://www.theguardian.com/us-news/2021/sep/09/hurricane-ida-louisiana-robert-taylor-home (describing the story of Robert Taylor, a Black man living on a low income, who built his house brick by brick over time and saw it destroyed by Hurricane Ida).

60. *See* Logan et al., *supra* note 59; Laughland, *supra* note 59; Catherine Coleman Flowers, *Hurricane Ida shows the one-two punch of poverty and climate change*, NATURE (Sept. 21, 2021), https://nature.com/articles/ d41586-021-02520-8.

61. Justin Dorazio, *How FEMA Can Prioritize Equity in Disaster Recovery Assistance*, CAP (July 19, 2022), https://www.americanprogress.org/article/how-fema-can-prioritize-equity-in-disaster-recovery-assistance/.

62. *Id.*; *see also* Christopher Flavelle, *Why Does Disaster Aid Often Favor White People?*, N.Y. TIMES (Oct. 27, 2021), https://www.nytimes.com/2021/06/07/climate/FEMA-race-climate.html (noting that under nearly identical circumstances one White neighbor received $17,000 from FEMA, whereas the Black neighbor only received $7,000).

63. Flavelle, *supra* note 62; *see also* Carly Berlin, *Without federal recognition, coastal tribes struggle to access FEMA aid*, SOUTHERLY (Nov. 22, 2021), https://southerlymag.org/2021/11/22/federal-recognition-coastal-tribes-fema/ (discussing difficulties of Louisiana native tribes in obtaining federal assistance from FEMA following disasters).

that members of vulnerable populations, such as low-income individuals, are less likely to receive federal assistance.[64]

With the increase in the strength and frequency of hurricanes and major storms, there may soon come a point at which destruction outpaces recovery in marginalized and vulnerable communities who currently experience, and will continue to experience, the greatest impact.[65] To combat this inequity and break the cycle of destruction exacerbated by slow, drawn-out recovery, governments, municipalities, and utility providers on the Louisiana coast should focus on decentralizing the energy grid, thus creating a more resilient system that will enable these communities to fare better before and after hurricanes and major storms.[66]

II. DEVELOPING RESILIENT DECENTRALIZED ENERGY THROUGH ROOFTOP COMMUNITY SOLAR MICROGRIDS

Decentralization of the energy grid refers to "locating . . . energy production facilities closer to the site of energy consumption," and can take many forms.[67] Although resilience methods such as community solar or microgrids can advance resilience efforts,[68] using them together in hybrid community solar microgrids can offer the combined benefits of both methods and would produce significant energy resilience improvements.

Community solar refers to "any solar project or purchasing program, within a geographic area, in which the benefits of a solar

64. *See* Rebecca Hersher & Ryan Kellman, *Why FEMA Aid Is Unavailable To Many Who Need It The Most*, NPR: WWNO (June 29, 2021, 5:01 AM), https://www.npr.org/2021/06/29/1004347023/why-fema-aid-is-unavailable-to-many-who-need-it-the-most (noting that FEMA has not analyzed racial disparities on who receives federal assistance).

65. *See* Knopp, *supra* note 54 ("The impacts of these hurricanes will be experienced most by communities of color and low-income communities, who have historically suffered high poverty rates, environmental burdens like air and water pollution, crumbling infrastructure, and a lack of resources.").

66. *See id*.

67. *See* LOW CARBON GREEN GROWTH ROADMAP FOR ASIA AND THE PACIFIC: FACT SHEET: DECENTRALIZED ENERGY SYSTEM 1, https://www.unescap.org/sites/default/files/14.%20FS-Decentralized-energy-system.pdf (last visited Dec. 4, 2022).

68. *See Community Energy Resilience*, CLIMATE CTR., https://theclimatecenter.org/our-work/community-energy-resilience/ (last visited Dec. 4, 2022); *National Community Solar Partnership*, ENERGY.GOV, https://www.energy.gov/communitysolar/community-solar (last visited Dec. 4, 2022).

project flow to multiple customers, such as individuals, businesses, nonprofits, and other groups."[69] Often, the solar project is located within the community.[70] Community solar offers a unique opportunity to low-income individuals, renters, and the owners of homes without adequate sunlight or roof space, as it allows these residents "to subscribe to a shared system of solar panels . . . ."[71] Depending on the ownership method involved, individuals who typically would not have the capital to invest in personal rooftop solar can obtain an ownership stake in the project, leading to several community benefits in addition to increased energy resilience.[72] Though community solar is often discussed in terms of sprawling solar farms located near subscribers,[73] areas without access to the space required for a solar farm or communities looking to minimize their footprint can locate rooftop community solar projects (similar to individual rooftop solar) on a collective of buildings or on one large building already standing within the community.[74] Specifically, placing rooftop community solar panels

69. *See National Community Solar Partnership*, *supra* note 68.

70. *See id*.

71. *See id*.

72. *See generally* U.S. DEP'T OF ENERGY: ENERGY EFFICIENCY & RENEWABLE ENERGY, A GUIDE TO COMMUNITY SOLAR: UTILITY, PRIVATE, AND NON-PROFIT PROJECT DEVELOPMENT 7 (2010), https://www.nrel.gov/docs/fy11osti/49930.pdf (discussing the differences between utility, special purpose entity, and non-profit owned community solar projects); Emily Walker, *Community solar developers: what you need to know*, ENERGYSAGE (July 15, 2022), https://news.energysage.com/community-solar-developers (discussing the differences between utility, special purpose entity, and developer owned community solar); *Community Solar*, CO-OP POWER, https://www.cooppower.coop/cos (discussing community-owned community solar) (last visited Dec. 4, 2022); *see also* IRENA: INT'L RENEWABLE ENERGY AGENCY, COMMUNITY-OWNERSHIP MODELS: INNOVATION LANDSCAPE BRIEF 6–8 (2020), https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Jul/IRENA_Community_ownership_2020 (discussing community ownership in energy generally and describing different methods of community ownership and their structures).

73. *See What is community solar?*, ENERGYSAGE (Oct. 3, 2022), https://www.energysage.com/solar/solar-101/what-is-community-solar (describing community solar as incorporating "a large, central solar power plant, whose electricity is shared by more than a single property").

74. *See* Shaun Keegan, *A Fresh Look at Solar for Warehouses and Commercial Buildings*, NAIOP: COM. REAL ESTATE DEV. ASSOC. (Fall 2022), https://www.naiop.org/en/Research-and-Publications/Magazine/2022/Fall-2022/Development-Ownership/A-Fresh-Look-at-Solar-for-Warehouses-and-Commercial-Buildings; Elizabeth Grant, *Solar Rooftop Arrays-What about Warehouses?,* S. MOUNTAIN P'SHIP (Aug. 8, 2022), https://southmountainpartnership.org/solar-rooftop-arrays-what-about-warehouses; *Community Solar*, CO-OP POWER, https://www.cooppower.coop/cos (illustrating groups of solar panels "belonging" to individual residents all located on a shared roof within the community) (last visited Dec. 4, 2022).

on top of critical facilities such as hospitals or community resilience centers "can enhance local community resilience by providing reliable electricity during grid disruptions[]" caused by hurricanes or other major weather events.[75] These projects can further support resilient energy development and production when they are incorporated into individual microgrids.[76]

A microgrid operates at the same voltage as the larger grid, but it is "a localized energy generation system that can disconnect from the larger grid and function independently . . . . in the case of disruption" to operate in what is referred to as "island mode."[77] The ability to operate as an island and generate power exclusive of the larger energy grid during times of disruption strengthens grid resilience and mitigates power disruption, which also "function[s] as a grid resource for faster system response and recovery."[78] In addition to the island capabilities that increase energy resilience, because microgrids generate power locally and do not necessarily rely on the movement of energy over long distances of transmission and distribution lines,[79] during extreme weather events there are fewer possible points for damage and repair, allowing affected systems to be repaired and come online faster. However, it is important to distinguish grid-connected solar panels from microgrids, as grid-connected solar panels alone do not operate as microgrids. Therefore, when the central grid is disrupted, even

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75. *See* STEPHEN ABBOT ET AL., COMMUNITY SOLAR+: HOW THE NEXT GENERATION OF COMMUNITY SOLAR CAN UNLOCK NEW VALUE STREAM AND HELP COMMUNITIES PURSUE HOLISTIC DECARBONIZATION 14 (RMI 2022), https://rmi.org/insight/community-solar-plus.

76. *See* Stephen Abbott & Julia Meisel, *Want Energy Resilience? Invest Locally.*, RMI (Oct. 5, 2022), https://rmi.org/want-energy-resilience-invest-locally/.

77. STEVEN COHEN, THE SUSTAINABLE CITY 153 (2018); *see also* Dan T. Ton & Merrill A. Smith, *The U.S. Department of Energy's Microgrid Initiative*, 25 ELEC. J., Oct. 2012, at 84 (internal quotations omitted) (The U.S. Department of Energy defines "microgrid" as "a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.").

78. U.S. DEP'T OF ENERGY: OFFICE OF ELEC., *The Role of Microgrids in Helping to Advance the Nation's Energy System*, ENERGY.COM, https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid/role-microgrids-helping (last visited Dec. 4, 2022).

79. *See* Elisa Wood, *What is a microgrid?*, MICROGRID KNOWLEDGE (Mar. 28, 2020), https://www.microgridknowledge.com/about-microgrids/article/11429017/what-is-a-microgrid.

homes with rooftop solar experience power outages.[80] Though grid-connected solar panels and solar microgrids both generate solar power, solar microgrids have the added benefit of energy storage that allows for "island" or independent operation from the larger grid when the larger grid system experiences disruption.[81] When solar microgrids are not forced to operate on an island, they remain connected to the central grid and can manage their resources by buying and selling energy "to achieve lowest prices, cleanest energy, greatest electric reliability or some other outcome."[82]

Community solar and microgrids are not necessarily mutually exclusive. By combining the two and creating rooftop community solar microgrids, disaster-prone regions like coastal Louisiana will see myriad benefits. Rooftop community solar microgrids would offer the benefits of community solar, including (1) generating clean energy, (2) expanding access to solar power to renters and low-to-moderate income households, and (3) providing economic investments and job opportunities to the communities they serve.[83] They also confer the benefits of a microgrid, including (1) reducing energy costs for low-to-moderate income households, (2) strengthening the central grid, and (3) increasing grid reliability, resilience, and recovery.[84] Rooftop community solar microgrids will allow for intelligent management of power to achieve the lowest price for clean energy while operating with the large central grid. And in the event of disruption of the central grid due to an extreme weather event, such as a hurricane, they will allow for island generation of power to critical infrastructure (possibly to individual residences depending on the amount of power

80. *See id.*; Elisa Wood, *Solar is Good. Solar Microgrids are Better*, MICROGRID KNOWLEDGE (Aug. 8, 2016), https://www.microgridknowledge.com/editors-choice/article/11432203/solar-is-good-solar-microgrids-are-better.

81. Wood, *supra* note 80; *see also* Jacob Marsh, *Does solar-plus-storage still work during an outage?*, ENERGYSAGE (Nov. 21, 2019), https://news.energysage.com/does-solar-plus-storage-still-work-during-an-outage.

82. *See* Wood, *supra* note 79; Sabine Chavin, *Microgrid Regulation Challenges and Opportunities*, KLEINMAN CTR. FOR ENERGY POL'Y (June 1, 2022), https://kleinmanenergy.upenn.edu/news-insights/microgrid-regulation-challenges-and-opportunities/.

83. *See* ABBOT ET AL., *supra* note 75.

84. *Think Microgrid Member Benefits*, THINK MICROGRID, https://www.thinkmicrogrid.org/benefits (last visited Dec. 4, 2022)*; see also* Don Wingate, *The Importance of Microgrids for Marginalized Communities*, MICROGRID KNOWLEDGE (July 31, 2020), https://www.microgridknowledge.com/resources/microgrid-perspectives/article/11428750/the-importance-of-microgrids-for-marginalized-communities.

generation) and faster restoration of power to locations within their networks, preventing long-lasting blackouts like those of Hurricane Ida. For instance, a hospital connected to a rooftop community solar microgrid may continuously operate with power throughout a major hurricane in island mode even when transmission lines are severed throughout the city. Then, instead of having to focus on repairing transmission lines on one side of town to restore power to the other, repairs can occur near the hospital, allowing for quicker identification of repair issues and shorter blackouts. Overall, rooftop community solar microgrids can provide communities, particularly historically marginalized communities, with energy independence regardless of home ownership or economic status. Such energy independence means life-saving resilience in the wake of impending stronger, more frequent weather events.[85]

III. USING FEDERAL LEGISLATION TO PROMOTE ROOFTOP COMMUNITY SOLAR MICROGRID DEVELOPMENT

Even though rooftop community solar microgrids sound great in theory, the question becomes: Are they a cost-prohibitive pipedream? While that concern is valid, recently passed federal legislation may provide methods of funding and other incentives that would allow for development of rooftop community solar microgrids in coastal cities in Louisiana, such as New Orleans, without forcing the cost of development and implementation on the end ratepayers.

A. THE INFRASTRUCTURE INVESTMENT AND JOBS ACT

On November 15, 2021, President Joe Biden signed the Infrastructure Investment and Jobs Act (IIJA), Public Law No. 117-58.[86] The trillion-dollar bipartisan infrastructure bill attempts to "grow the economy, enhance our competitiveness, create good jobs, and make our economy more sustainable,

85. *See How climate change makes hurricanes more destructive*, ENV'T DEF. FUND, https://www.edf.org/climate/how-climate-change-makes-hurricanes-more-destructive (last visited Dec. 4, 2022) (discussing the nature of intensification and increased frequency of major weather events due to climate change).

86. *H.R.3684 - Infrastructure Investment and Jobs Act*, CONGRESS.GOV (Nov. 15, 2021), https://www.congress.gov/bill/117th-congress/house-bill/3684/actions.

resilient, and just."[87] This Act provides for more than $65 billion of investments in the power grid and clean energy transmission in order to upgrade current energy infrastructure by "building thousands of miles of new, resilient transmission lines to facilitate the expansion of renewables and clean energy, while lowering costs."[88] Title I of Division D of the IIJA, "Energy," is devoted to "Grid Infrastructure and Resiliency," and Subsection A addresses "Grid Infrastructure Resilience and Reliability."[89] Relevant to this Article, § 40101 of the IIJA addresses "Preventing Outages and Enhancing the Resilience of The Electric Grid."[90] The IIJA starts by defining eligible entities, broadly listing electricity grid operators, storage operators, generators, transmission owners and operators, distributers, and fuel suppliers.[91] However, the Act clarifies its purpose as supplemental in nature[92] and caps eligible funding at the amount the entity spent on resiliency efforts during the previous three years.[93] Particularly pertinent to Louisiana energy distributers, eligible entities must include in their applications "a report detailing past, current, and future efforts by the eligible entity to reduce the likelihood and consequences of disruptive events."[94] Priority is given to resiliency projects that "will generate the greatest community benefit (whether rural or urban) in reducing the likelihood and consequences of disruptive events."[95] The potential uses of the IIJA's grants are expansive, including:

> (e)(1) A grant awarded to an eligible entity under the program may be used for activities, technologies, equipment, and

87. *UPDATED FACT SHEET: Bipartisan Infrastructure Investment and Jobs Act,* WHITE HOUSE (Aug. 2, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/02/updated-fact-sheet-bipartisan-infrastructure-investment-and-jobs-act/; *see also* Jacob Pramuk, *Biden signs $1 trillion bipartisan infrastructure bill into law, unlocking funds for transportation, broadband, utilities*, CNBC (Nov. 15, 2021, 9:16 PM), https://www.cnbc.com/2021/11/15/biden-signing-1-trillion-bipartisan-infrastructure-bill-into-law.html.

88. *See President Biden's Bipartisan Infrastructure Law*, WHITE HOUSE, https://www.whitehouse.gov/bipartisan-infrastructure-law/ (last visited Dec. 12, 2022).

89. Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 923 (as codified at 42 U.S.C. §§ 18711–713).

90. *Id.* (as codified at 42 U.S.C. § 18711).

91. *Id.* § 40101(a)(2), 135 Stat. 923 (as codified at 42 U.S.C. § 18711).

92. *See id.* § 40101(c)(1), 135 Stat. 923–24 (as codified at 42 U.S.C. § 18711).

93. *See id.* § 40101(c)(3), 135 Stat. 924 (as codified at 42 U.S.C. § 18711).

94. Infrastructure Investment and Jobs Act § 40101(c)(2)(B), 135 Stat. 924 (as codified at 42 U.S.C. § 18711).

95. *Id.* § 40101(c)(4), 135 Stat. 924 (as codified at 42 U.S.C. § 18711).

> hardening measures to reduce the likelihood and consequences of disruptive events, including—
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> (A) weatherization technologies and equipment;
>
> (B) fire-resistant technologies and fire prevention systems;
>
> (C) monitoring and control technologies;
>
> (D) the undergrounding of electrical equipment;
>
> (E) utility pole management;
>
> (F) the relocation of power lines or the reconductoring of power lines with low-sag, advanced conductors;
>
> (G) vegetation and fuel-load management;
>
> *(H) the use or construction of distributed energy resources for enhancing system adaptive capacity during disruptive events, including—*
>
> *(i) microgrids; and*
>
> *(ii) battery-storage subcomponents;*
>
> (I) adaptive protection technologies;
>
> (J) advanced modeling technologies;
>
> (K) hardening of power lines, facilities, substations, of other systems; and
>
> (L) the replacement of old overhead conductors and underground cables.[96]

For such resilience efforts, Congress has allocated $5 billion in grants, which run through 2026.[97]

While the IIJA makes these funds available for various energy resilience efforts that "improve the electric grid's resistance to extreme weather, wildfires, and other natural disasters," the IIAJ does not allocate funding toward specific grid resilience efforts, and the actual allocation is largely discretionary.[98] Recognizing this,

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96. *Id*. § 40101(e)(1), 135 Stat. 926 (as codified at 42 U.S.C. § 18711) (emphasis added).

97. *Id*. § 40101(j), 135 Stat. 928 (as codified at 42 U.S.C. § 18711).

98. *See* Chris Galford, *Bipartisan Congressional letter encourages DOE to use Infrastructure Investment funds for microgrids*, DAILYENERGYINSIDER (July 7, 2022), https://dailyenergyinsider.com/news/35738-bipartisan-congressional-letter-

United States Representatives Jimmy Panetta and Andrew Garbarino, along with eighteen other representatives including Louisiana Representative Troy Carter, sent a letter to the Secretary of the Department of Energy advocating for a "sufficient investment" in microgrids from the available funding.[99] The letter notes that microgrids, through their island abilities, allow for uninterrupted power at critical facilities and community centers during larger power energy disruptions of the larger grid due to extreme weather events.[100] The representatives argue that investing in microgrid projects will maximize the benefits from the federal dollars while enhancing grid resilience at lower emission rates when compared to traditional backup power because the projects typically utilize solar or wind power generation.[101] Representatives Panetta and Garbarino are correct in arguing that investing in microgrid implementation would provide true power resilience, and it is urged that the Secretary of the Department of Energy embrace this plea for allocation of funds.

If the Secretary decides to allocate funds toward microgrid projects, then the question becomes: Who can apply? The IIJA provides that the Secretary can award funds directly to eligible entities[102] or states or Indian Tribes, which in turn may award to eligible entities;[103] however, the award to eligible entities is further restricted by limitations[104] and matching requirements.[105] Eligible entities cannot receive "an amount that is greater than the total amount that the eligible entity has spent in the previous three years on efforts to reduce the likelihood and consequences of disruptive events,"[106] and if an eligible entity receives a grant it must match it by 100%.[107] Even if a community could form an

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encourages-doe-to-use-infrastructure-investment-funds-for-microgrids/; 42 U.S.C. § 18711.

99. *See* Letter from Jimmy Panetta et al., U.S. Rep., to Jennifer Granholm, Secretary, U.S. Dep't of Energy (June 30, 2022), https://panetta.house.gov/sites/panetta.house.gov/files/documents/2022.06.30_LETTER_DOE_Microgrids%20in%20IIJA.pdf.

100. *See id*.

101. *See id*.

102. 42 U.S.C. § 18711(c)(1).

103. *Id.* § 18711(d)(1).

104. *See id.* § 18711(c)(3).

105. *See id.* § 18711(d)(8) (matching requirement for states and Indian Tribes); *id.* § 18711(h) (general matching requirement).

106. 42 U.S.C. § 18711(c)(3).

107. *Id.* § 18711(h)(1).

eligible entity in hopes of obtaining funding to construct a community solar microgrid, these restrictions on funding effectively preclude full community ownership, special purpose entity ownership, and non-profit ownership, effectively requiring utility ownership in Louisiana. This represents a huge drawback of the IIJA and a missed opportunity for generating wealth from within marginalized communities by instead favoring larger utility companies. Therefore, although Entergy may qualify under the IIJA as an eligible entity, a new community-owned special purpose entity would not have the requisite funds to match grants or the history to provide three years of funding information. However, in Entergy New Orleans's case, the incompatibility of community ownership models may seem particularly inequitable.

Although Entergy New Orleans is a subsidiary of Entergy Corporation, a Fortune 500 company,[108] it has continuously looked to the residents and ratepayers to fund its resilience efforts.[109] Specifically, the previously discussed New Orleans Power Station was funded by an extra $11 monthly fee to Entergy's ratepayers,[110] and an additional increase in utility rates by $49.5 million, which resulted in a monthly increase of around $10 to support reliability, resilience, and sustainability efforts following the aftermath of Hurricane Ida.[111] Therefore, it seems that the community has been funding resilience efforts for years, but under the name of Entergy and without any of the benefits of ownership.

Nonetheless, residents of coastal Louisiana, specifically New Orleans, *need* resilience projects; Entergy is urged to apply for funding under the IIJA. If Entergy can secure the funding, the next hurdle for customers could be Entergy's matching requirement. Whereas in the past Entergy has secured capital funds by passing the cost to the customer, Entergy is urged to shoulder its own burden. Entergy customers have consistently seen increases with little improvement (not to mention the total failure during Hurricane Ida in New Orleans), and nonetheless

108. *About us*, ENTERGY, https://www.entergy.com/about-us/.

109. Hammer, *supra* note 44.

110. *Id*.

111. *See* Chris Galford, *Entergy New Orleans to increase rates by $49.5M in deal with New Orleans City Counci*l, DAILYENERGYINSIDER (Nov. 1, 2021), https://dailyenergyinsider.com/news/32521-entergy-new-orleans-to-increase-rates-by-49-5m-in-deal-with-new-orleans-city-council/ (explaining that while the $49.5 million increase was approved, it was "supplemented by a credit resolution of approximately $17 million to offset the formula rate plan increase's effects on customers").

some customers have seen their Entergy bill gradually double or triple.[112] Not only should Entergy take the position of refusing any rate increase to satisfy the matching requirement for any funding under the IIJA, but after receiving the funding Entergy should further commit to removing all previous increases that have been put in place to subsidize Entergy's resilience initiatives, gradually returning customers' bills to payable amounts. A resilient grid offers little benefit to customers who cannot afford to turn their lights on.

Currently, Entergy is moving in the opposite direction, and proposing several more rate increases.[113] Following Hurricane Ida, Entergy proposed a $1.3 billion plan to harden the power grid, including the possibility of adding battery, natural gas, solar, or hybrid microgrids. But similar to NOPS, Entergy again proposed spreading the costs equally among its ratepayers.[114] As an eligible entity under the IIJA, Entergy is encouraged to apply for funding to construct these microgrids as suggested in 42 U.S.C. § 18711(e)(1)(H)(i). Specifically, Entergy should use the funding to prioritize construction of rooftop community solar microgrids—the company already participates in residential rooftop solar[115] and

112. Kaitlin Rust, *High Entergy bills breaking the bank for customers across the state*, FOX 8 (July 18, 2022, 9:34 PM), https://www.fox8live.com/2022/07/19/high-entergy-bills-breaking-bank-customers-across-state/.

113. *See* Matt Sledge, *Entergy New Orleans unveils $1.3B plan to harden power grid for stronger storms*, NOLA.COM (July 2, 2022 4:00 AM), https://www.nola.com/article_3b21bc48-f975-11ec-a43f-1fd156687d22.html (Entergy has proposed $1.3 billion in hardening to be spread equally among ratepayers, in addition to "requesting a $4 monthly increase to the average residential customer to replenish its storm reserve, a $7 increase under its regular formula rate plan and a $4 increase to cover the costs of recovering from Ida."); Jessica Williams, *Entergy's 100-acre solar plant nears completion in New Orleans East; will start running next month*, NOLA.COM (Oct. 28, 2020, 11:29 AM), https://www.nola.com/article_aba68cd4-191e-11eb-b032-a78711d806c4.html (noting that the completion of New Orleans Solar Station would result in an increase in monthly bill of $1.50 per month for ratepayers).

114. *See* Sledge, *supra* note 113 (noting that the $1.3 billion price tag is if all proposals are implemented, which does not seem to be the plan, and that a microgrid option was not factored into the proposed price but could add an extra $200 million to the price tag.); Lee Sabatini, *Entergy New Orleans makes resilience and hardening filing to strengthen grid*, ENTERGY (July 1, 2022), https://www.entergynewsroom.com/news/entergy-new-orleans-makes-resilience-hardening-filing-strengthen-grid/.

115. *See* Maleiya Porter-Jones, *Entergy New Orleans Reaches Rooftop Solar Milestone*, ENTERGY (June 17, 2020), https://www.entergynewsroom.com/news/entergy-new-orleans-reaches-rooftop-solar-milestone/.

community solar programs.[116] By combining its current microgrid technology efforts, Entergy could construct rooftop community solar microgrids with IIJA funding. However, because the ratepayers have largely been paying for the company's own resilience efforts, they should not have to purchase additional shares to take advantage of rooftop community solar microgrids while Entergy takes advantage of the IIJA. By equitably applying rooftop community solar microgrids to its subscribers without again raising monthly costs, Entergy will foster energy security and resilience for marginalized communities that have been disproportionately subjected to the climate crisis and its resulting extreme weather events that are becoming more frequent.

B. THE INFLATION REDUCTION ACT OF 2022

Alternatively, if not approved for a grant under the IIJA, Entergy could apply for a loan through the Inflation Reduction Act.[117] On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022 (IRA), Public Law No. 117-169.[118] The IRA was passed to "fight inflation, invest in domestic energy production and manufacturing, and reduce carbon emissions by roughly 40 percent by 2030."[119] To achieve these goals, the IRA amended the Energy Policy Act of 2005 by adding § 1706, known as the Energy Infrastructure Reinvestment Program (EIR).[120] The "IRA appropriates $5 billion through September 30, 2026, to carry out

116. *See* Jessica Williams, *City Council approves first steps toward 'community solar' power program*, NOLA.COM (June 21, 2018, 5:15 PM), https://www.nola.com/article_04df5db1-f15f-5c41-a073-f0c65af300f8.html (Entergy approved to install five megawatts of the planned 100 megawatts of solar capacity in beginnings of community solar project); *New Orleans City Council Community Solar Program*, ENTERGY, https://www.entergy-neworleans.com/community-solar/ (last visited Dec. 14, 2022).

117. The IRA places limitations on "double benefit," and in order to use an EIR loan with the IIJA grant, the project would need to fall within an enumerated exception, which is unlikely. *See* Inflation Reduction Act of 2022, H.R. Res. 5376 at 227, 117th Cong. § 50141(d)(3) (2022) (enacted).

118. *H.R.5376 – Inflation Reduction Act of 2022*, CONGRESS.GOV (Aug. 16, 2022), https://www.congress.gov/bill/117th-congress/house-bill/5376/actions.

119. SENATE DEMOCRATS, SUMMARY: THE INFLATION REDUCTION ACT OF 2022, https://www.democrats.senate.gov/imo/media/doc/inflation_reduction_act_one_page_summary.pdf.

120. *See* Inflation Reduction Act of 2022, H.R. Res. 5376 at 227–28, 117th Cong. § 50144 (2022) (enacted); LOAN PROGRAM OFF., *#DeployDeployDeploy: 2. The Energy Infrastructure Reinvestment (EIR) Program*, ENERGY.GOV (Sept. 15, 2022), https://www.energy.gov/lpo/articles/deploydeploydeploy-2-energy-infrastructure-reinvestment-eir-program.

EIR, with a total cap on loans of up to $250 billion."[121] This program "guarantees [loans] . . . for projects that . . . retool, repower, repurpose, or replace energy infrastructure that has ceased operations[ ] . . . [or that] enable operating energy infrastructure to avoid, reduce, utilize, or sequester air pollutants or anthropogenic emissions of greenhouse gases."[122]

Microgrids that are used to repurpose existing infrastructure and reduce greenhouse gas emissions would qualify under the EIR. Through this program, Entergy could apply for financing to repurpose some of its existing infrastructure to support community solar microgrids instead of having to start entirely from scratch.[123] By securing funding through a federal loan, Entergy would not need to raise the capital to make the necessary adjustments to its current operations. Moreover, ratepayers could see additional benefits from the EIR program's allowance for qualified projects "to refinance higher-cost debt and equity, saving ratepayers billions of dollars."[124]

However, even if Entergy receives funding through the IIJA, the IRA provides countless tax incentives for the company to create rooftop community solar microgrids. The IRA is projected to provide $161 billion in "Clean Energy Tax Credits," $40 billion in "Air Pollution, Hazardous Materials, Transportation and Infrastructure Tax Credits," $37 billion in "Individual Clean Energy Incentives," $27 billion in "Building Efficiency, Electrification, Transmission, Industrial, DOE Grants and Loans," and $14 billion in "Other Energy and Climate Spending."[125] Title I – Committee on Finance, Subtitle D – Energy Security, Part 1 – Clean Electricity and Reducing Carbon Emissions could be particularly applicable to Entergy's development of community solar microgrids.[126] Section 13102 provides for "Extension And

121. LOAN PROGRAM OFF., *Inflation Reduction Act of 2022*, ENERGY.GOV, https://www.energy.gov/lpo/inflation-reduction-act-2022 (last visited Dec. 17, 2022).

122. Inflation Reduction Act of 2022, H.R. Res. 5376 at 229, 117th Cong. § 50144 (2022) (enacted)

123. *See id.*; LOAN PROGRAM OFF., *supra* note 120.

124. *See* Christian Fog et al., *The Most Important Clean Energy Policy You've Never Heard About*, RMI (Sept. 13, 2022), https://rmi.org/important-clean-energy-policy-youve-never-heard-about/.

125. *What's In the Inflation Reduction Act?*, COMM. FOR A RESPONSIBLE FED. BUDGET (July 28, 2022), https://www.crfb.org/blogs/whats-inflation-reduction-act.

126. *See* Inflation Reduction Act of 2022, H.R. Res. 5376 at 90, 117th Cong. (2022) (enacted).

Modification of Energy Credit," and extends energy credit to microgrid controllers and other microgrid components.[127] The IRA "establishes a 30% tax credit through 2032 for the technologies used within microgrids, including solar, energy storage and microgrid controllers."[128] Through these and various other incentives within the IRA, the cost of microgrids could be cut by 10% to 50%.[129] Entergy, along with other coastal energy providers, should take advantage of these incentives and construct microgrids to help create a more resilient power grid.

CONCLUSION

In the wake of the climate crisis Louisiana residents are subjected to stronger, more frequent extreme weather events, leading to increased numbers of blackouts for longer durations. Particularly vulnerable to power disruptions are historically marginalized communities who are less likely to have stormproof housing or the ability to evacuate when extreme weather events arrive. When the lights go out, they stay out for these communities unlike some of their non-marginalized or wealthier counterparts. Power restoration efforts may take longer due to less resilient structures and outdated infrastructure. These marginalized communities need power restored first. However, that is rarely the case. By making the grid more resilient, these communities will be less prone to power disruptions. The current power grid system in Louisiana, particularly in New Orleans, relies too much on outside-generated power, and in the event of extreme weather events such as Hurricane Ida, the people in the city can be left without access to power for weeks, causing detrimental effects on public health and safety.

Implementing rooftop community solar microgrids within New Orleans would make the grid more resilient by creating microgrids that could work with the existing grid and, in the event of power disruptions, operate through local power generation and

127. *See* Inflation Reduction Act of 2022, H.R. Res. 5376 at 97–100, 117th Cong. § 13102(f) (2022) (enacted).

128. Kathy Hitchens, *Resource page: Inflation Reduction Act and microgrids*, MICROGRID KNOWLEDGE (Oct. 26, 2022), https://www.microgridknowledge.com/tech-software/article/11436843/resource-page-inflation-reduction-act-and-microgrids.

129. *See* Lisa Cohn, *Update: Climate bill—which could cut microgrid costs 10% to 50%—passes US Senate on Sunday*, MIRCOGRID KNOWLEDGE (Aug. 5, 2022), https://www.microgridknowledge.com/distributed-energy-resources/article/11427140/update-climate-bill-which-could-cut-microgrid-costs-10-to-50-passes-us-senate-on-sunday.

storage on the roofs of buildings within the community. Entergy New Orleans, as an eligible entity, can apply for funding to support this project through the federal IIJA; however, Entergy must match the grant amount. It is urged that Entergy refrain from passing the costs of creating a resilient grid onto ratepayers, and instead should look to the IRA for tax credits and possible financing through the EIR. Together, the IIJA and IRA could provide funding and incentives to create a resilient grid, and Entergy should fully take advantage of these Acts and related programs to fight the effects of the climate crisis by implementing rooftop community solar microgrids in New Orleans and other coastal cities in Louisiana.