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A PEAK COALITION REPORT

DEMANDING A BETTER GRID

HOW DEMAND MANAGEMENT CAN ACCELERATE THE PHASE-OUT OF NEW YORK CITY'S PEAKER POWER PLANTS

NYC Environmental Justice Alliance • New York Lawyers for the Public Interest
THE POINT CDC • UPROSE • Clean Energy Group

ABOUT THIS REPORT

This report, prepared by the PEAK Coalition – UPROSE, The Point CDC, New York City Environmental Justice Alliance, New York Lawyers for the Public Interest, and Clean Energy Group—focuses on demand management initiatives, particularly demand response and virtual power plants, as highly effective measures to accelerate peaker power plant retirement and complement new clean energy generation development. The report advances a vision for electricity demand governance in a just transition by examining case studies in different jurisdictions and surveying pathways to scale demand response and virtual power plant programs in a manner that is equitable for, accountable to, and prioritizing the needs of disadvantaged communities in New York City.

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Executive Summary

The PEAK Coalition—Clean Energy Group, New York City Environmental Justice Alliance (NYC-EJA), New York Lawyers for the Public Interest (NYLPI), THE POINT Community Development Corporation (The POINT CDC), and UPROSE—has been fighting to shut down New York City's polluting fossil-fuel peaker power plants and replace them with alternatives such as renewable energy and battery storage in Disadvantaged Communities[1] since 2019. New York State's Climate Leadership and Community Protection Act (CLCPA, or Climate Act), passed in 2019, mandated that the electricity grid be zero-emissions by 2040. This target has spurred increased development of renewable energy resources across the state, but progress remains slow—bringing major renewable energy and battery storage projects online often takes many years in New York State.[2]

This report focuses on ways to address New York City's growing demand through robust demand management solutions, including best practices for centering equity in demand management program development, as well as establishing a regulatory framework for implementation.

The sluggish development of clean energy alternatives to fossil fuels comes at a time of exponential peak demand growth driven by ongoing electrification efforts, growth in energy intensive sectors such as microchip manufacturing, and the retirement of New York City's dirtiest peakers because of the New York State Department of Environmental Conservation's Peaker Rule that targets sources of harmful emissions of nitrogen oxides.[3] The New York Independent System Operator (NYISO), the quasi-government organization tasked with operating New York's electricity grid and administering its markets, identified a potential energy generation deficit of 446 megawatts in its *2024 Quarter 2 Short-Term Assessment of Reliability (STAR) Report*, which is approximately 4.5 percent of the City's total peak load.[4] This projected shortfall was used to justify the extended use of two peaker plants, Gowanus Generating Station and Narrows Generating Station, past the 2025 Peaker Rule compliance date,[5] subjecting nearby communities in Sunset Park, Brooklyn, to extended exposure to harmful emissions.

This report focuses on ways to address New York City's growing demand through robust demand management solutions, including best practices for centering equity in demand management program development, as

1 The term "Disadvantaged Communities" in this report refers to communities meeting criteria approved by the New York State Climate Justice Working Group on March 27, 2023. To learn more, visit: https://climate.ny.gov/resources/disadvantaged-communities-criteria.

2 Office of the New York State Comptroller. (2024, April 24). *Application Review and Site Permitting for Major Renewable Energy Projects*. New York State Office of Renewable Energy Siting. https://www.osc.ny.gov/state-agencies/audits/2024/04/24/application-review-and-site-permitting-major-renewable-energy-projects.

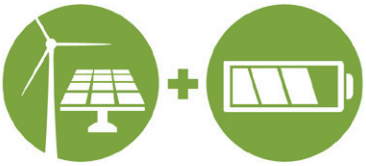
3 New York Independent System Operator. (2024, July 12). *Short-Term Assessment of Reliability: 2024 Quarter 2*. https://www.nyiso.com/documents/20142/39103148/2024-Q1-STAR-Report.pdf/f5e38d94-3578-e297-d2ce-8173c380395f.

4 Id.

5 Id.

Benefits of Demand Management

Reduced Emissions and Pollutants



Increased Grid Resilience and Reliability

Increased Community Investment and Benefits

Increased Energy Affordability

well as establishing a regulatory framework for implementation. The report concludes that a well implemented demand management program should achieve four key objectives:

1. Reduced greenhouse gas and co-pollutant emissions through reduced fossil fuel power plant operations and accelerated retirement. This is especially critical in the short term to reduce the possibility for any unnecessary extensions to the continued operation of existing fossil fuel generation facilities.
2. Increased reliability and resilience of New York's grid. The chances of blackouts and brownouts can be reduced or eliminated to the best extent possible, including during times of natural disaster when some fossil fuel power plants may become unavailable.
3. Community investments and participation in benefits such as workforce retention and creation associated with demand response and vitual power plant (VPP) development, particularly in areas impacted by historic or ongoing power plant emissions, as well as increased consciousness of energy use issues and best practices. This will require new, smarter ways of thinking and incorporating rising talent, technology, and innovations into critical infrastructure.
4. Increased energy affordability and price stability because of compensation for demand management, time- of-use rates, shifts in energy demand, reduction of overall demand, or increases in energy supply.

While demand management cannot necessarily address the entire projected energy-generation deficit New York state currently faces, it is a rapidly implementable solution that can narrow the anticipated gap significantly. Importantly, demand management solutions can provide a cost-effective and emissions-free alternative to extending the life of existing, polluting, fossil-fuel assets like the Gowanus and Narrows peakers. If implemented effectively, demand management programs can also reduce energy burden, increase reliability, and generate workforce development opportunities for New York City's most marginalized communities.

The PEAK Coalition hopes this report will assist lawmakers, regulators, and state agencies to think beyond traditional energy planning and consider how demand management programs can benefit disadvantaged communities, how existing barriers that can be overcome, and how New York City might take steps toward better implementation and scale-up of demand management systems.

Shifting Gears in Energy Governance

The PEAK Coalition was founded in 2020 as a campaign to end the long-standing pollution burden from fossil fuel power plants in New York City's most vulnerable communities. Working together, the Coalition advocates for replacing peaker power plants with emissions-free alternatives like renewable energy and battery storage. "Peaker" plants are highly polluting power plants that come online when other sources of electricity cannot meet peak demand. These are typically old, inefficient, oil- and gas-burning plants that poison surrounding communities with harmful pollutants such as nitrogen oxides (NOx) and do so at an enormous cost to ratepayers. Our coalition represents over 750,000 New Yorkers, 78 percent of whom are people of color or low-income people living within a half mile of these peaker plants.[6] These facilities inflict a steep burden on human health and climate and are the epitome of environmental injustice.

The need for an accelerated transition away from fossil fuels and toward wind, solar, and other renewable energy sources cannot be overemphasized, and the consequences of a failure to do so cannot be overstated.

The need for an accelerated transition away from fossil fuels and toward wind, solar, and other renewable energy sources cannot be overemphasized, and the consequences of a failure to do so cannot be overstated. In this report, we argue for implementing and scaling multiple strategies for managing demand while transitioning to clean energy generation.

The Gowanus and Narrows generating stations are located in the densely populated Sunset Park neighborhood of Brooklyn. PHOTO: SEBASTIAN BAEZ/UPROSE

6 Based on member organizations of NYC-EJA near power plants and the 2024 U.S. Census.

New York State's Climate Leadership and Community Protection Act (CLCPA, or Climate Act), passed in 2019, mandated that the electricity grid be zero-emissions by 2040. The Climate Act also includes interim requirements for the sector, such as 10 gigawatts (GW) of solar generation by 2025, a 70 percent renewable energy grid by 2030, 6 GW of energy storage capacity by 2030, and 9 GW of offshore wind generation. Section 7 of the CLCPA further stipulates the identification, protection, and prioritization of historically marginalized Disadvantaged Communities[7] with all permits, licenses, and other administrative approvals and decisions. The Act and subsequent administrative decisions or actions have accelerated the progress to phase out New York's oldest, dirtiest, and costliest power plants like fossil fuel peakers. Unfortunately, today, there are serious concerns that this momentum will come to a screeching halt.

As highlighted in the PEAK Coalition's January 2024 report, *Accelerate Now! The Fossil Fuel Endgame 2.0*, the City's peaker plants are in decline. When the PEAK Coalition formed in 2019, 6,093 megawatts (MW) of fossil fuel peaker capacity was operating in New York City. Now, 700 MW of that capacity has fully retired, while 3,300 MW worth of capacity have announced plans to retire. This progress is promising but entirely too slow. Every time a peaker plant fires up, there is an enormous cost to human health, to the planet, and to people's pocketbooks. The Coalition's last report identified five purported barriers to shutting down peaker plants: rising demand, maintaining reliability, uncertain renewable energy economics, regulatory barriers, and false solutions. Of these five barriers, one continues to stand out above the rest: reliability.

A battery storage facility built to address growing demand in Queens. PHOTO: THE PEAK COALITION

Concerns over electric grid reliability have been around since the origin of the clean energy transition. Unlike fossil fuels, renewable power generation sources such as wind and solar are not readily dispatchable—the electricity produced cannot be easily increased or decreased on demand. This is why energy storage is pivotal to the clean energy transition and why the PEAK Coalition advocates replacing peaker plants with a combination of renewable energy and battery storage solutions. Both standard battery and long-duration energy storage (LDES) have faced many barriers in New York City, from space limitations, zoning regulations, and strict fire codes, to the grueling bureaucratic process for developers to implement large-scale renewable energy production alongside energy storage to maximize clean energy production.

7 The term "Disadvantaged Communities" in this report refers to communities meeting criteria approved by the New York State Climate Justice Working Group on March 27, 2023. To learn more, visit: https://climate.ny.gov/resources/disadvantaged-communities-criteria.

In the PEAK Coalition's fight to shut down New York City's peakers, we have thus far focused on shifting the City's energy generation from dirty fossil fuels to renewable sources as the basis to shut down these hazardous power plants. However, the balance between electricity generation and demand is not and should not be a one-sided issue. This report focuses on energy demand and using demand management solutions to address the City's massive energy load.

WHAT IS DEMAND MANAGEMENT?

Demand management uses a wide range of strategies to reduce consumer electricity load and more efficiently use electricity during times of peak demand. Robust and equitably implemented demand management programs can provide grid stability during times of peak demand without sacrificing the health and safety of vulnerable New Yorkers. Demand management programs have been used in some form across the United States for decades. Utility-controlled Demand-Side Management (DSM) programs were born in the 1970s[8] amidst concerns about dependence on foreign oil as well as the environmental impacts of electricity generation, such as nuclear power.[9] The U.S. Energy Information Administration (EIA) defines DSM as:

> "a utility action that reduces or curtails end-use equipment or processes. DSM is often used in order to reduce customer load during peak demand and/or in times of supply constraint. DSM includes programs that are focused, deep, and immediate such as the brief curtailment of energy-intensive processes used by a utility's most demanding industrial customers, and programs that are broad, shallow, and less immediate such as the promotion of energy-efficient equipment in residential and commercial sectors."[10]

Smart kitchen appliances are one type of demand management technology.
PHOTO: ROSSHELEN/BIGSTOCK

8 Parasekvakos; Theodoros G. et al. (1984) *Apparatus and method for remote sensor monitoring, metering, and control* (U.S. patents Nos. 4241237-a, 4455453 and 7940901). U.S. Patent and Trademark Office. https://bit.ly/4etB8dD.

9 Eto, J. (1996, December 1). *The Past, Present, and Future of U.S. Utility Demand-Side Management Programs*. U.S. Department of Energy, Office of Scientific and Technical Information. https://doi.org/10.2172/491537.

10 U.S. Energy Information Administration. (n.d.). *Glossary*. Accessed September 18, 2024. https://www.eia.gov/tools/glossary/index.php.

Demand management has since expanded beyond DSM for numerous reasons and takes many different forms, including energy-efficient appliances, distributed energy resources (DERs) like solar and batteries, demand response (DR), and aggregations of controllable devices known as virtual power plants (VPPs). This report focuses on DR and VPPs as key demand management tools to help meet peak demand in New York City and eliminate reliance on peaker plants.

Demand Response

Demand response programs are demand-side tools that help stabilize the grid and frequently offer incentives to program participants to lower energy usage at times of peak demand. The EIA defines demand response as "incentive-based programs that encourage electric power customers to temporarily reduce their demand for power at certain times in exchange for a reduction in their electricity bills."[11] Demand response programs vary widely. Some programs allow customers to maintain control of when to curtail electricity consumption, while some allow the utility to reduce load directly.

Demand response programs have also been organized by their motivation scheme. Price-based schemes, such as time-of-use electricity rates, motivate participation by increasing electricity prices by a known amount during periods of peak demand; whereas incentive-based schemes offer a rebate or financial incentive to consumers who reduce usage during peak electric demand, such as a specified dollar per kilowatt (kW) or kilowatt-hour (kWh) payment.[12] Utilities have offered some form of demand response participation to industrial consumers for a long time. Demand response participation has recently become more automated with the rise of third-party providers that have created a business around signing up customers to participate in demand response programs.[13]

Demand management has since expanded beyond DSM for numerous reasons and takes many different forms, including energy-efficient appliances, distributed energy resources (DERs) like solar and batteries, demand response (DR), and aggregations of controllable devices known as virtual power plants (VPPs).

Virtual Power Plants

Virtual power plants are networks of distributed energy resources, such as batteries, solar panels, EV chargers, and smart thermostats, that are aggregated to provide services to the electric grid.[14] While DERs often refer to devices that generate or store power, they can also include devices that can be controlled to decrease energy consumption when necessary to provide demand response, such as adjusting the timing for electricity use by water heaters and other large appliances (See Figure 1 (p. 11) for ways in which DERs can shape demand).[15] VPPs require software and networks of digital communication to coordinate and harness DERs so that they are available when they are most needed.[16]

11 Id.

12 Parrish, Bryony, Phil Heptonstall, Rob Gross, and Benjamin K. Sovacool. (2020, March 1). A Systematic Review of Motivations, Enablers and Barriers for Consumer Engagement with Residential Demand Response. *Energy Policy*, 138, 111221. https://doi.org/10.1016/j.enpol.2019.111221.

13 Takemura, Alison. (2022, June 2). *The Power Grid Explained — plus Demand Response, Virtual Power Plants and More*. Canary Media. https://www.canarymedia.com/articles/guides-and-how-tos/the-power-grid-explained-plus-demand-response-virtual-power-plants-and-more.

14 Explainer: What Is a Virtual Power Plant? (2023, January). *Reuters*. https://www.reuters.com/business/sustainable-business/what-is-virtual-power-plant-2023-01-31.

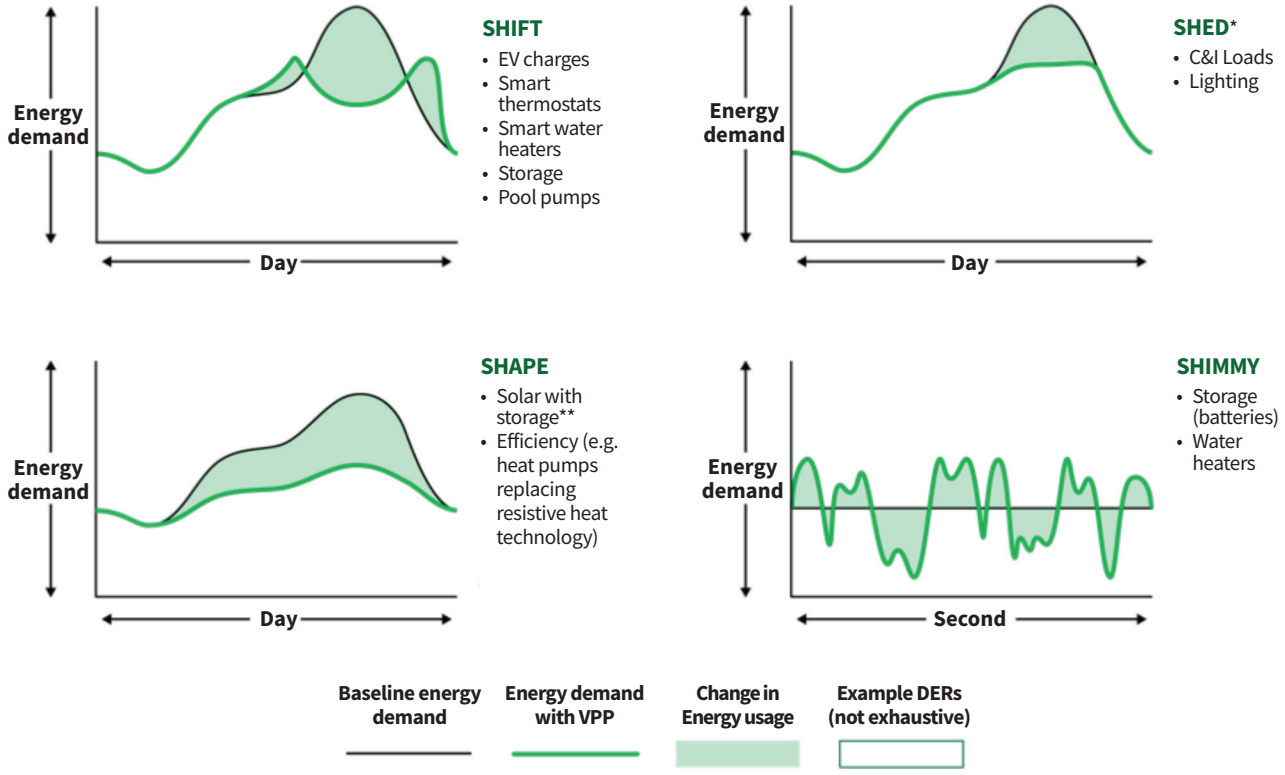
15 Takemura.

16 Id.

In addition to stabilizing the grid, VPPs can provide reduced utility bills or direct payments for the power they supply to the grid.[17] As of March of 2024, about two dozen states have deployed VPP programs in some form.[18] Virtual power plants present a promising non-wires solution to respond to rising peak demand and variable renewable generation, particularly as VPPs can respond to short-term reliability needs relatively quickly.

In addition to stabilizing the grid, VPPs can provide reduced utility bills or direct payments for the power they supply to the grid.

FIGURE 1: **How DERs can shape energy demand.**



Notes:

* Load shed for some DERs results in load shifting to later hours as a system (e.g., HVAC) recovers from an event.

** Distributed solar with storage reduces demand on the grid without impacting the energy consumed behind the meter.

Source: Adapted from Lawrence Berkeley National Laboratory and NASEO-NARUC Grid-Interactive Buildings Working Group.

17 Id.

18 Gallucci, Maria. (2024, March 13). *Four Ways Virtual Power Plants Can Help the US Grid Keep up with Demand*. Canary Media. https://www.canarymedia.com/articles/virtual-power-plants/four-ways-virtual-power-plants-can-help-the-us-grid-keep-up-with-demand.

Rethinking Demand

Bringing major renewable projects online often takes many years in New York State,[19] but energy reducing demand management programs can be implemented without the lengthy construction times required for large infrastructure projects, resulting in real and immediate benefits without the years of wait time and emissions. The need for greater demand management strategies is also a necessary outgrowth of New York's enormous and growing load. Demand for energy in New York City requires, on average, approximately 5,500 MW of generation capacity, which can balloon up to 10,000 MW during periods of peak demand in the summertime.[20] The New York Independent System Operator (NYISO), the quasi-government organization tasked with operating New York's electricity grid and administering its markets, identified a potential energy generation deficit of 446 MW in its 2024 Quarter 2 Short-Term Assessment of Reliability (STAR) Report, or approximately 4.5 percent of the City's total peak load. This potential generation shortfall is relatively small compared to the City's overall load. Well-implemented demand management schemes can be additional tools to address NYISO's predicted energy generation deficit and can be implemented within a relatively short timeframe.

The need for greater demand management strategies is also a necessary outgrowth of New York's enormous and growing load. Demand for energy in New York City requires, on average, approximately 5,500 megawatts of generation capacity, which can balloon up to 10,000 MW during periods of peak demand in the summertime.

The 446 MW shortfall identified by NYISO is driven by projected increases in peak demand due to ongoing electrification efforts, growth in energy intensive sectors such as microchip manufacturing, and the retirement of New York City's dirtiest peakers as a result of the New York State Department of Environmental Conservation's Peaker Rule, which targets sources of harmful NOx emissions.[21] This projected shortfall was used to justify the extended use of two peaker plants, Gowanus Generating Station and Narrows Generating Station, past the 2025 Peaker Rule compliance date.[22] This decision subjects nearby Disadvantaged Communities in Sunset Park, Brooklyn, to extended exposure to harmful emissions. Now, Gowanus and Narrows could operate until 2027 or beyond. Grid operators have indicated that a further extension until 2029 is likely if current electricity demand trends continue.[23]

19 Office of the New York State Comptroller, Office of Renewable Energy Siting. (2024, April 24). *Application Review and Site Permitting for Major Renewable Energy Projects*. https://www.osc.ny.gov/state-agencies/audits/2024/04/24/application-review-and-site-permitting-major-renewable-energy-projects.

20 New York Independent System Operator. (2022, April). *2022 Load & Capacity Data Gold Book*. https://www.nyiso.com/documents/20142/2226333/2022-Gold-Book-Final-Public.pdf/cd2fb218-fd1e-8428-7f19-df3e0cf4df3e.

21 New York Independent System Operator. (2024, July 12). *Short-Term Assessment of Reliability: 2024 Quarter 2*. https://www.nyiso.com/documents/20142/39103148/2024-Q1-STAR-Report.pdf/f5e38d94-3578-e297-d2ce-8173c380395f.

22 Id.

23 Conversation with New York Independent System Operator employees, March 28, 2023.

Demand response tools like smart thermostats can contribute to large-scale reductions in demand.
PHOTO: MARIADAV/ BIGSTOCK

Effective deployment of demand management programs can significantly reduce reliability shortfalls that otherwise would enable peaker plants to continue operations. New York City's Citywide Administrative Services (DCAS) has run a successful demand management program since 2013, which has earned total revenues of over $120 million and has reduced peak summer demand by 122 MW. The program's biggest reductions have come from energy efficiency upgrades as well as the installation of inexpensive real-time meters (RTMs), which can help optimize building energy usage.[24] Similarly, demand response measures incentivized by the battery storage demand response programs in Massachusetts, Connecticut, and New Hampshire were able to shave 375 MW off-peak demand for the New England grid during some of the summer's hottest days, the equivalent of adding the capacity of a medium-sized natural gas plant to the grid.[25]

WHY CAN'T NEW YORK JUST BUILD ITSELF OUT OF ITS DEMAND PROBLEM?

The CLCPA states that New York needs to achieve many interim mandates for building renewable energy and battery storage ahead of 2040. The state has also added an additional 4 GW to the solar mandate and doubled its commitment to energy storage, totaling at least 25 GW of renewable energy generation or battery storage capacity by 2035. While there have been challenges to offshore wind and energy storage development, solar deployment has outpaced projections. This is precisely the time to double down on investments for a just energy transition; but instead, the state is considering backtracking on some of its mandates and commitments through legal loopholes.[26]

24 New York City Department of Citywide Administrative Services. (2024, July 10). *DCAS Announces 600+ City Facilities to Participate in Summer Energy Reduction Program to Safeguard the City's Electric Grid.* http://www.nyc.gov/site/dcas/news/015-24/dcas-600-city-facilities-participate-summer-energy-reduction-program-safeguard.

25 Wasser, Miriam. (2024, August 28). *How 'Virtual Power Plants' Help Reduce Peak Power Demand in New England.* WBUR. https://www.wbur.org/news/2024/08/28/virtual-power-plants-eversource-massachusetts-batteries-ev-chargers.

26 New York Public Service Commission. (2024, July 8). Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard. https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-E-0302.

There are already massive ongoing costs to maintaining and operating peaker plants, and the savings from their retirement will be significant. Keeping the Gowanus and Narrows peaker plants online will cost ratepayers an estimated average of $90 million anually based on capacity payments made to these plants from 2010-2019.[27] By comparison, the Brooklyn-Queens Demand Management (BQDM) program, created by Consolidated Edison, Inc. (ConEd) as a non-wires alternative to more costly electrical infrastructure capital construction, harnessed smaller distributed resources and demand management to provide a net $95 million benefit instead of a nearly $1 billion physical transmission investment.[28]

There are already massive ongoing costs to maintaining and operating peaker plants, and the savings from their retirement will be significant.

In addition to reducing power generation costs, demand management programs would also save money on transmission and distribution investments needed for electrification. In New York State, distribution system upgrade costs required for transportation electrification are estimated to be $1.4 billion if charging of residential light-duty vehicles and fleet medium- and heavy-duty vehicles is managed to minimize electricity peaks, and $26.8 billion if charging is not managed, representing a 95 percent cost reduction.[29]

A structural approach to demand management can be a tremendously cost-effective way to address peak electricity demand, especially compared to the time and costs required to develop physical generation-side upgrades like a fossil gas peaker plant or even battery storage.

NEW YORK CITY'S CURRENT DEMAND MANAGEMENT LANDSCAPE

Despite the cost-savings potential of demand management, NYISO lags behind other regional transmission operators in its use of this tool. It is ranked in the bottom third of the country's system operators in a measure of actual total peak demand savings from demand response.[30] New York State is the only region where participation in demand response programs decreased between 2018 and 2019,[31] placing New York last among regions capable of addressing any energy supply and demand mismatches.

ConEd, the regulated utility with monopolistic control over New York City's bulk power distribution systems, called on retail demand response operation for only eight days in 2023,[32] compared to 23 days in 2020.[33] ConEd currently has a demand response program known as Smart Usage Rewards that is facilitated by approved

27 PEAK Coalition. (2020, May). *Dirty Energy, Big Money.* Clean Energy Group. https://www.cleanegroup.org/publication/dirty-energy-big-money.

28 Girouard, Coley. (2019, March 11). BQDM Program Demonstrates Benefits of Non-Traditional Utility Investments. Utility Dive. https://www.utilitydive.com/news/bqdm-program-demonstrates-benefits-of-non-traditional-utility-investments/550110.

29 New York Research and Development Authority. (2022, May). Transportation Electrification Distribution System Impact Study. https://www.nyserda.ny.gov/About/Publications/Energy-Analysis-Reports-and-Studies/Transportation-Reports.

30 U.S. Energy Information Administration. (2019, March 29). Demand-Side Management Programs Save Energy and Reduce Peak Demand - U.S. Energy Information Administration (EIA). https://www.eia.gov/todayinenergy/detail.php?id=38872.

31 Danly, James, Neil Chatterjee, Richard Glick, and Allison Clements. (2020, December). 2020 Assessment of Demand Response and Advanced Metering. Federal Energy Regulatory Commission. https://www.ferc.gov/sites/default/files/2020-12/2020%20Assessment%20of%20Demand%20Response%20and%20Advanced%20Metering_December%202020.pdf.

32 Markham, Aaron. (2023, October 13). NYISO Summer 2023 Hot Weather Operations [PowerPoint slides]. New York Independent System Operator. https://www.nysrc.org/wp-content/uploads/2023/10/7.3.3-Summer-2023-NYISO-Hot-Weather-Operating-Conditions-Final-10-3-23-EC-v1-Attachment-7.3.3.pdf.

33 Yeomans, Wes. (2020, September 23). *NYISO Summer 2020 Hot Weather Operations* [PowerPoint slides]. New York Independent System Operator. https://bit.ly/3Be66Iv.

third-party aggregators or for individual customers who can commit greater than 50 kW of reduction, which is much higher than the energy use of households or most small businesses.[34]

Customers generally reduce their demand by managing their equipment usage, like heating, ventilation, and cooling (HVAC); lighting; unnecessary equipment; elevator banks; production lines; or by turning to distributed generation like backup diesel generators or battery storage units.[35] Industrial/manufacturing customers who participate often reduce a major percentage of their peak summer load (more than 80 percent) by changing or shutting down operations; they make up 5 percent of demand response customers (although not necessarily the same percentage of total load reduction). Commercial facilities (including offices, restaurants, lodging, entertainment, and warehouses) are 36 percent of demand response customers, while educational customers are 21 percent of demand response customers. Government customers represent 8 percent of demand response customers. New York City government buildings participate voluntarily through the DCAS demand management program and third-party vendors.[36]

ConEd's Smart Usage Rewards program currently achieves much smaller actual peak demand savings than other utilities with similar customer bases and even less than some utilities with a fraction of the customer base.

ConEd's Smart Usage Rewards program currently achieves much smaller actual peak demand savings than other utilities with similar customer bases and even less than some utilities with a fraction of the customer base. According to the EIA's Annual Electric Power Industry Report released in October 2023, ConEd has roughly 3.6 million electric customers, of which 37,026 residential customers and 3,070 non-residential customers are enrolled in demand response, for a total of 40,096 demand response customers.[37] These programs resulted in actual peak demand savings of 27.7 MW for residential customers and 309.9 MW for commercial customers in 2022.[38] In contrast, Commonwealth Edison, a utility of similar size to ConEd, which provides electric service to approximately 3.8 million customers in the Greater Chicago Area,[39] has over 400,000 residential customers enrolled and had an actual peak demand savings of 120 MW for residential customers—approximately 4.5 times greater than ConEd's residential savings.[40] AES Indiana, which only has 500,000 electric customers, had 59,057 residential customers enrolled in demand response in 2022 and achieved an actual peak demand savings of 33.4 MW.[41]

THE POTENTIAL FOR DEMAND MANAGEMENT IN NEW YORK CITY

In 2023, New York City had a peak demand of 10,360 MW during the summer and 7,130 MW in winter. In its 2024 forecast, NYISO forecasted that by 2050, the peak power demand in the city will increase by 20 to 45 percent in

34 Consolidated Edison. (2023, December 1). Demand Response (Rider T) Program Guidelines: 2024 Capability Period. https://www.coned.com/-/media/files/coned/documents/save-energy-money/rebates-incentives-tax-credits/smart-usage-rewards/smart-usage-program-guidelines.pdf?la=en.

35 Consolidated Edison. (2020, February 18). 2020 *Demand Response Forum* [PowerPoint slides]. https://bit.ly/4evrck2.

36 New York City Department of Citywide Administrative Services. (2021, September 9). Demand Response Program. https://www.nyc.gov/site/dcas/agencies/demand-response.page.

37 U.S. Energy Information Administration. (2023, October). *Annual Electric Power Industry Report*. https://www.eia.gov/electricity/data/eia861.

38 Id.

39 Exelon Corporation. (2013). *ComEd Overview.* https://www.exeloncorp.com/company/Documents/ComEd_overview_fact_sheet.pdf.

40 U.S. Energy Information Administration. (2023, October). *Annual Electric Power Industry Report*. https://www.eia.gov/electricity/data/eia861.

41 Id.

summer and by 100-170 percent in winter, even after considering high contributions of energy efficiency. The increase in power demand is expected to come from rapidly electrifying sectors, specifically electric vehicles and building heating and cooling, as well as new large-load interconnections like artificial intelligence data centers and microchip manufacturing. Together, these sectors are expected to add 1,650 to 2,370 MW to the city's summer peak demand, and 8,450 to 11,920 MW to the winter peak demand by 2050.

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The potential of demand management in New York City is dependent on the capability of the system to harness these growing resources to create flexibility from customer loads. A 2024 study of the potential for load flexibility in Maine by Brattle proposed two scenarios of demand management capabilities for electric vehicle (EV) charging and electric heating.[42] The baseline scenario assumes that 67 percent of the EV demand can be managed by delaying charging for up to 8 hours and that 10 percent of heating demand can also be controlled for one hour. Its high flexibility scenario assumes that 100 percent of EVs and 50 percent of heaters could be managed for 24 hours and 2 hours, respectively. Applying these demand management assumptions, combined with the expected levels of electrification in New York City by 2050, specifically on EVs and heating, results in a flexibility potential of 596 MW to 1,752 MW during summer (4,148 MWh to 28,363 MWh) and 1,407 MW to 6,695 MW during winter (6,037 MWh to 45,774 MWh).

TABLE 1: **Flexibility potential from electrifying loads in New York City and New York State**

SUMMER								
Flexible Load Potential in New York State (Summer)								
Year	**New York State (Baseline)**				**New York State (High Flexibility)**			
2024	105	MW	843	MWh	169	MW	4,056	MWh
2030	794	MW	6,352	MWh	1,391	MW	33,384	MWh
2040	2,807	MW	22,453	MWh	5,622	MW	134,928	MWh
2050	3,753	MW	30,021	MWh	8,357	MW	200,568	MWh

WINTER								
Flexible Load Potential in New York State (Winter)								
Year	**New York State (Baseline)**				**New York State (High Flexibility)**			
2024	195	MW	1,563	MWh	313	MW	7,512	MWh
2030	1,233	MW	9,867	MWh	2,161	MW	51,864	MWh
2040	3,889	MW	31,109	MWh	7,788	MW	186,912	MWh
2050	4,933	MW	39,467	MWh	10,984	MW	263,616	MWh

SUMMER								
Flexible Load Potential in New York City (Summer)								
Year	**New York City (Baseline)**				**New York City (High Flexibility)**			
2024	15	MW	123	MWh	25	MW	600	MWh
2030	105	MW	843	MWh	185	MW	4,440	MWh
2040	376	MW	3,008	MWh	753	MW	18,072	MWh
2050	507	MW	4,059	MWh	1,130	MW	27,120	MWh

WINTER								
Flexible Load Potential in New Yort City (Winter)								
Year	**New York City (Baseline)**				**New York City (High Flexibility)**			
2024	28	MW	224	MWh	45	MW	1,080	MWh
2030	160	MW	1,280	MWh	280	MW	6,720	MWh
2040	511	MW	4,091	MWh	1,024	MW	24,576	MWh
2050	661	MW	5,291	MWh	1,472	MW	35,328	MWh

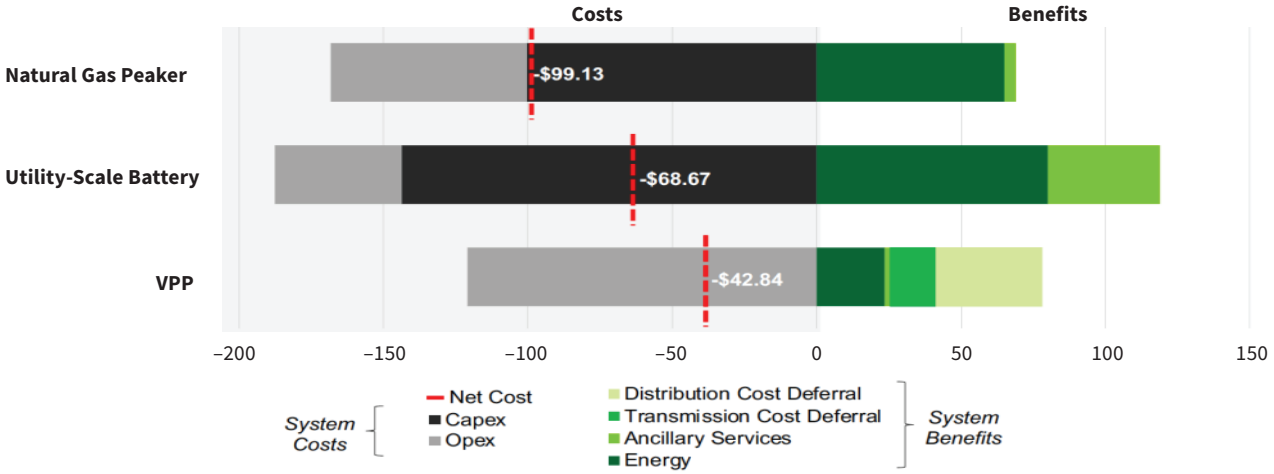
Source: Strategen Consulting

42 Maine Governor's Energy Office. (2023, November 16). *New, updated considerations for Maine's Energy Plan* [PowerPoint Slides]. Brattle. https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/ME%20GEO%20Pathways%20-%20Stakeholder%20Meeting%203%20-%2016Nov2023.pdf.

Using this approach, the flexibility potential derived from the electrification of transportation and building sectors for New York State and New York City during the summer and winter is shown in Table 1 (p.16).

In September 2023, the U.S. Department of Energy (DOE) published *Pathways to Commercial Liftoff: Virtual Power Plants* that describes the many costs and benefits of VPPs as a solution to alleviate future capacity needs. That report report found that VPPs are the most affordable source of capacity after all costs and monetizable benefits are considered (net cost). Peak capacity obtained from a virtual power plant of "residential smart thermostats, smart water heaters, home-managed EV [electric vehicle] charging, and BTM [behind-the-meter] batteries" can be "40% less expensive than from a utility-scale battery and 60% less expensive than from a natural gas peaker plant, according to a study of a representative utility system in 2030."[43]

FIGURE 2. **Net cost to a utility in the U.S. of procuring peaking capacity (2022 $/kW-year)**



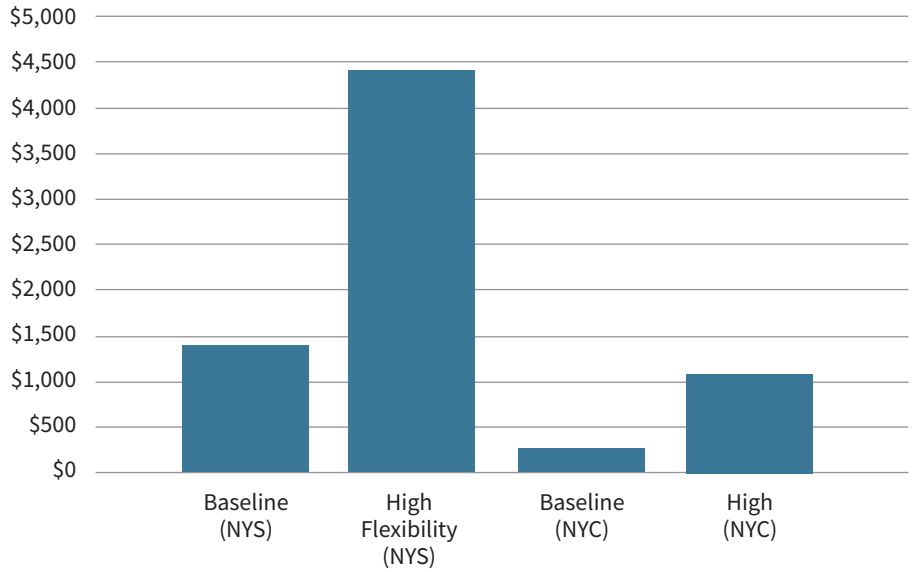
Capex refers to capital expenditures, while Opex refers to operational expenditures.
Source: U.S. Department of Energy

As shown in Figure 2, the benefits of flexible loads represented by the VPP option include the deferral of investments in the transmission and distribution systems, as requirements for bulk electricity transmission are not as necessary when load flexibility is triggered to meet electricity demand. Other benefits not included in the net cost calculation are improved reliability and reliance, avoided emissions, and community choice.

As shown in Figures 3 (p. 18) and 4 (p. 18), meeting capacity needs always comes at a net cost. While the cost of supplying capacity through VPPs is $42,840 per MW-year, doing it using utility-scale batteries is $68,670/MW-yr, while using gas peaker plants is $99,130 per MW each year. Considering the numbers for potential flexibility from electrifying loads in Table 1, the value of harnessing demand side management in New York City is between $253 and $1,080 million (net present value (NPV) for the 2024–2050 period) when compared to the next best alternative for capacity, utility-level batteries, and in the range of $552 to $2,353 million when compared to a gas peaker alternative.

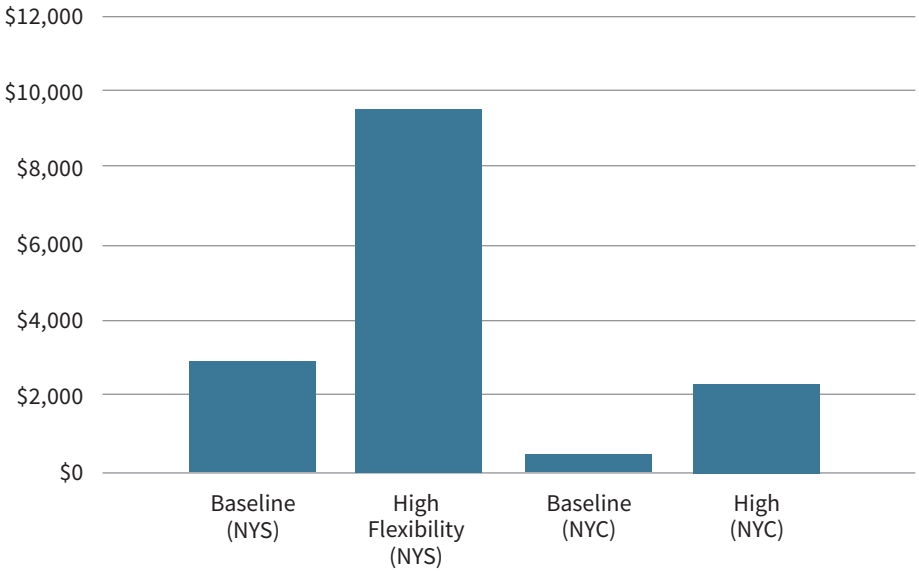
43 Downing et al. (2023, September). Pathways to Commercial Liftoff: Virtual Power Plants. *U.S. Department of Energy*. https://liftoff.energy.gov/wp-content/uploads/2023/09/20230911-Pathways-to-Commercial-Liftoff-Virtual-Power-Plants_update.pdf.

FIGURE 3: **New York State and New York City savings from using VPPs instead of battery storage capacity (2050 NPV in Millions $)**



Source: Stragen Consulting

FIGURE 4: **New York State and New York City savings from using VPPs instead of building new natural gas peaker plant capacity (2050 NPV in Millions $)**



Source: Stragen Consulting

Demand Management for Energy Justice

Demand management programs must support energy justice through procedural and distributive means, especially to reduce the need for harmful peaker plants. This section provides an overview of the energy justice issues a demand management program can address, how these programs can address these issues, and barriers to increasing the scale of such a program, particularly in environmental justice neighborhoods.

ENERGY JUSTICE ISSUES

Peaker plants are responsible for a sweeping variety of energy injustices at both the production and demand ends of the electrical grid. On the production side, as the PEAK Coalition has documented in its report *Dirty Energy, Big Money*, 750,000 New Yorkers live within a half mile of a peaker plant, and 78 percent of these are people of color or low-income.[44] These residents disproportionately endure the air pollutants from peaker plants that contribute up to 94 percent of the state's NOx emissions on high ozone days, despite providing as little as 36 percent of the gross electricity load.[45] *Dirty Energy, Big Money* also revealed that ratepayers shelled out at least $4.5 billion for these plants in capacity payments directly from their electricity bills from 2010 to 2019. However, despite their tremendous public health and financial costs, peaker plants cannot always prevent the negative demand-side consequences of an overburdened electrical grid: brownouts (grid voltage reductions that restrict available power) and blackouts (complete power outages).

Similar to the air pollution impacts from peaker plants, the impacts of blackouts and brownouts are unequal across New York City. The PEAK Coalition's analysis of ConEd's demand response requests from 2011–2023 provides insights into precisely which areas and communities are disproportionately forced to experience the demand-side failures of peaker plants through brownouts and blackouts (Figure 5, p. 20). Although the utility calls on all grid "networks" (electrical grid areas that map onto multiple or parts of neighborhoods) to reduce electricity demand, the Ridgewood, Richmond Hill, Crown Heights, and Fox Hills networks are called on most often to reduce electricity demand (Figure 6, p. 21).

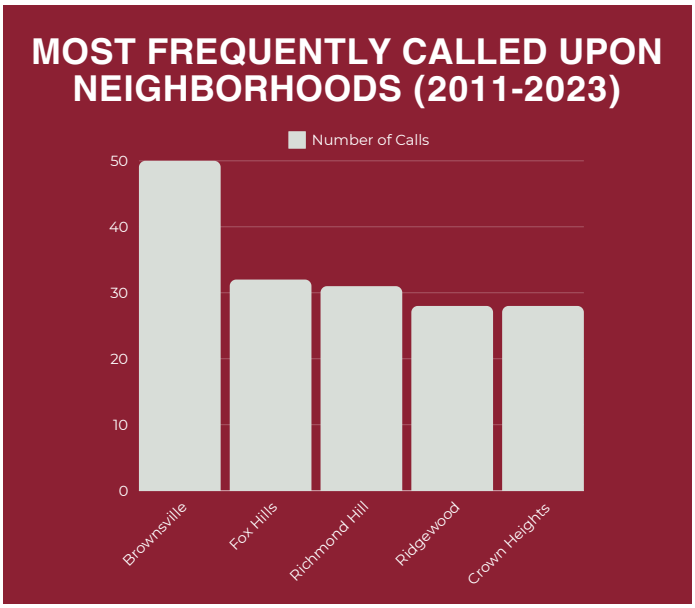
These networks are also those that have received the greatest number of demand response activations overall. Although these neighborhoods typically are not where peaker plants are sited, they are also communities that are majority working class and people of color and have the highest heat vulnerability index scores.[46] Previous research using calls to 311 about power outages in New York City similarly finds that there are "spatial clusters

44 PEAK Coalition. (2020, May). *Dirty Energy, Big Money.* Clean Energy Group. https://www.cleanegroup.org/wp-content/uploads/Dirty-Energy-Big-Money.pdf.

45 Strategen Consulting on behalf of the PEAK Coalition. (2021, March). The Fossil Fuel End Game: A Frontline Vision to Retire New York City's Peaker Plants by 2030. *PEAK Coalition*. https://www.cleanegroup.org/wp-content/uploads/Fossil-Fuel-End-Game.pdf.

46 PEAK Coalition. (2020, May). *Dirty Energy, Big Money.* Clean Energy Group. https://www.cleanegroup.org/wp-content/uploads/Dirty-Energy-Big-Money.pdf.

FIGURE 5: **Neighborhoods most frequently called upon to reduce demand (also known as a brownout)**



In the past 12 years, the following neighborhoods were only called once: Times Square, Sutton, Rockview, Washington Street, and City Hall.

NEIGHBORHOOD ANALYSIS:

HEAT VULNERABILITY INDEX*

Brownsville

5 out of 5. Higher surface temperatures during the daytime characterize neighborhood conditions that create the *highest risk* for heat-based illnesses and heat-related mortality.

Richmond Hill, Crown Heights, Fox Hills

4 out of 5. Less vegetation and green space, among other factors, created *increased risk* for heat-related mortality.

Ridgewood

2 out of 5. *Lower risk* for heat-related mortality due to lower daytime surface temperatures and more green space.

* https://ehp.niehs.nih.gov/doi/10.1289/ehp.1408178
8A Case-Only Study of Vulnerability to Heat Wave-Related Mortality in New York City (2000-2011)
HVI data for Fox Hills is taken from neighboring Clifton neighborhood due to insufficient available public data.

Source: The PEAK Coalition

of high call areas … in Census tracts with high energy burdens, lower-income households, and high percentages of people of color."[47] Meanwhile, grid networks with more tourists in wealthier, whiter, and more commercial areas like Times Square and Sutton (northeast Midtown) have only been called on to reduce electricity consumption once in the last 12 years, despite having lower heat vulnerability indices. For the ratepayers in New York City who pay 8.4 percent of their income toward energy utilities and experience increased air pollution and/or blackouts, the failure of expensive peaker plants is a deadly injustice.[48]

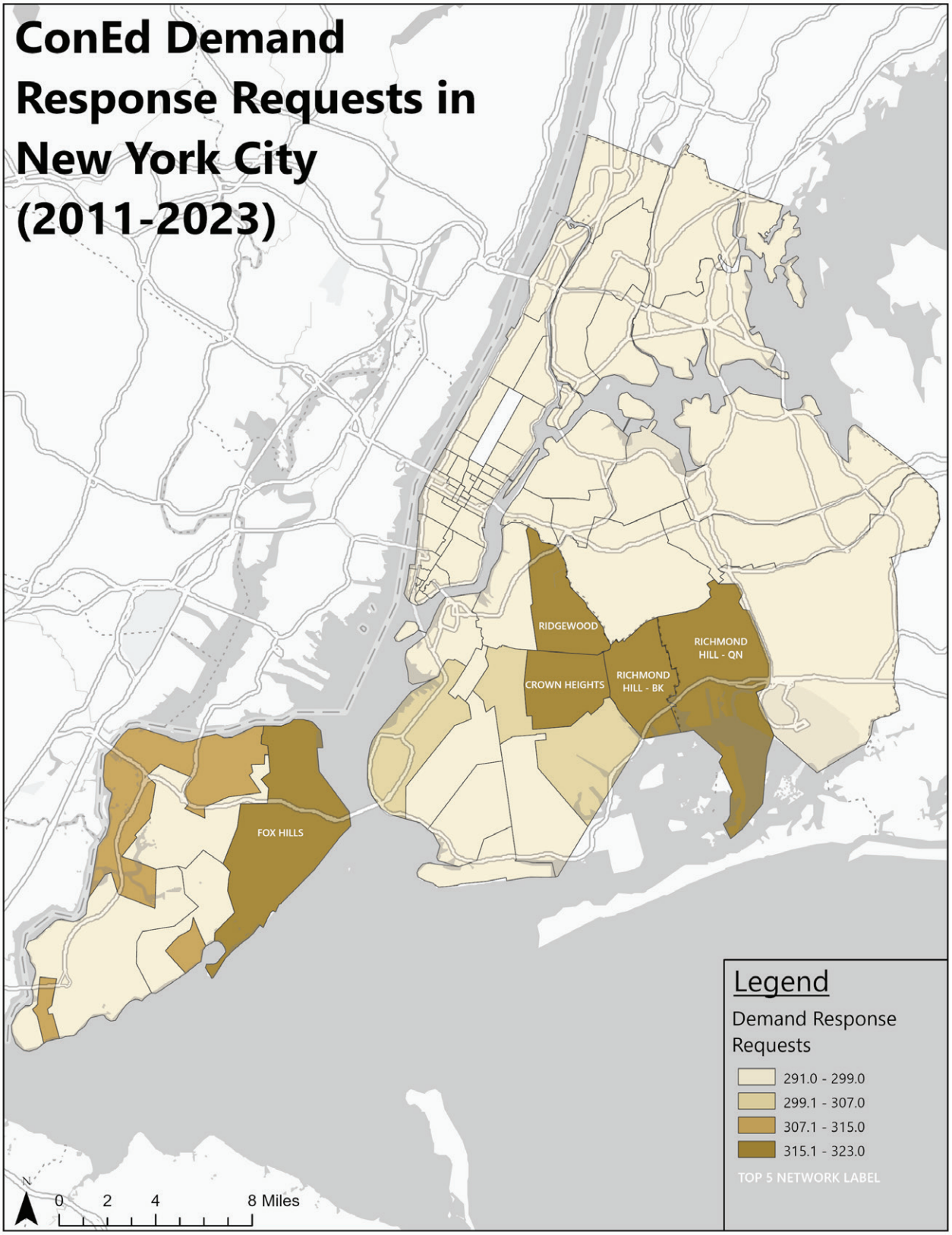
STRUCTURING DEMAND MANAGEMENT FOR ENERGY JUSTICE

A demand management program has the opportunity—and imperative—to be equitable, reduce energy injustices at the points of electricity production and consumption, and guarantee more affordable electricity to all ratepayers. An equitable demand management program should be structured to significantly reduce air pollution from peaker plants; prevent blackouts and brownouts; reduce the cost of electricity reliability, especially for LMI ratepayers; and fairly compensate program participants who have historically borne the burdens of peaker plants.

47 Marcotullio, Peter J., Olta Braçe, Kathryn Lane, Carolyn E. Olson, Jenna Tipaldo, Jennifer Ventrella, Liv Yoon, Kim Knowlton, Gowri Anand, and Tom Matte. (2023, December 1). Local Power Outages, Heat, and Community Characteristics in New York City. *Sustainable Cities and Society*. 99:104932. https://doi.org/10.1016/j.scs.2023.104932.

48 APPRISE Incorporated prepared on behalf of the New York State Energy Research and Development Authority: NYSERDA LMI Market Characterization Study. (2016). Special Topic Report – Household Energy Burden: *NYSERDA Low-to-Moderate-Income Market Characterization Study Special Topic Report –Household Energy Burden.* https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/LMI-Special-Topic-Rpt---Energy-Burden.pdf.

FIGURE 6. **New York City's most called-upon grid networks to reduce electricity demand**



Source: Created by Nebraska Hernandez. Basemap: NYC OpenData, New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

The Gowanus substation in Sunset Park is located next to the Gowanus generating station and the Joseph J. Seymour power plant in Brooklyn. PHOTO: SEBASTIAN BAEZ/UPROSE

An equitable demand management program can provide significant electrical capacity that should be used as near-term operations and long-term planning solutions to reduce the air pollution and blackouts/brownouts that occur during peak grid demand. Various case studies and examples of successfully and rapidly scaled demand management programs across the U.S., including with New York City's own municipal buildings and PEAK Coalition's estimates outlined in the previous chapter, provide ample evidence that an expanded program in the city could shift, shed, shape, or slash upwards of hundreds of megawatts of peak demand. This capacity should be deployed as a near-term operations solution to eliminate the short-term reliability needed to prevent blackouts or brownouts and reduce day-ahead peaker plant operations.

Ahead of quarterly forecasts that shape predicted peak electricity demand, a demand management program can strategically expand enrollment to better match the scale of the anticipated seasonal peak. On a day-ahead timeline, a robust demand management program can and should be the primary and priority resource deployed to address peak electricity demand before calling on expensive, polluting peaker plants. Only when the demand management program cannot meet peak demand completely and when other renewable energy or energy systems are insufficient should peaker plants be deployed as a resource of last resort. Rapid implementation of a demand management program can decrease the number/frequency of events when air pollutants are emitted, and the frequency with which blackouts/brownouts occur in working class communities of color.

As a longer-term planning solution, the capacity of a demand management program should be deployed to effectively meet identified medium- and long-term reliability gaps and ensure that peaker plants are not forced to stay online past their retirement deadlines, as seen in the extended permits for Gowanus and Narrows generating stations in Sunset Park. Instead of relying on peaker plants to meet reliability needs, a demand response program should be the priority resource to fill an identified medium- and long-term reliability gap, and if the program is insufficiently large, it can be ordered to expand via increased enrollment to meet that gap with years of lead time. A similar logic applies to proactively enable peakers to retire ahead of their mandatory or voluntary deadlines. In the long term, a demand management program can therefore prevent peaker plants from remaining on standby, where they emit air pollution during test events and cost ratepayers significant sums in capacity payments, even when no electricity is ultimately generated into the grid.

In addition to air pollution reduction benefits, an equitable demand management program can reduce how much ratepayers pay on electricity bills by both removing the extractive costs for retaining or operating peaker plants, as well as introducing regenerative benefits for demand management performance during program activations and standby. Although ratepayers may experience similar benefits by avoiding peaker plant costs, the regenerative benefits can be equitably structured based on which ratepayers are called on to reduce electricity and when payments are credited.

ConEd's electrical networks for demand management are classified as Tier 1 or Tier 2. Consistent with criteria from state utility regulations, Tier 2 networks are those with greater need to relieve electrical loads in "contingencies," and as such, are a higher priority for demand response.[49] Tier 2 networks are paid at a higher incentive rate than Tier 1 networks in the Distributed Load Relief Program, which puts out a demand management call with at least a two-hour notice if the next "contingency" results in electrical distribution equipment overload or an outage to more than 15,000 customers.[50] With the exception of Williamsburg, no communities with peaker power plants are classified as Tier 2 networks in 2024.[51] Accounting for bulk transmission capabilities, the state and ConEd should reclassify energy burdened and power plant communities into the Tier 2 priority networks.

In addition to air pollution reduction benefits, an equitable demand management program can reduce how much ratepayers pay on electricity bills.

Regulators and utilities should also reduce barriers for LMI households to participate in demand response programs. Currently, only certain customers can directly or indirectly participate in ConEd's demand management programs, and they are compensated in different ways. Customers who can provide more than 50 kW of load reduction to ConEd directly ("Direct Participants") receive an on-bill credit, which makes the benefits of a demand response immediate, simple, and less expensive. Conversely, smaller customers can only enroll in ConEd's existing demand response programs through a third-party aggregator and receive compensation through an electronic deposit or mailed check, which does not reduce electricity bills as immediately or simply as direct bill credits. These customers are generally not households, as only 10 of the 28 aggregators currently approved by ConEd accept small residential customers.[52]

A more transformative demand management program should include accessible enrollment for small commercial and residential customers, equitable marketing, and strong consumer protections. Information about compensation rates, average payments, and how to enroll should be easy to find, simple to understand, and available in languages other than English. Compensation should be streamlined with on-bill credits and be sufficiently meaningful for small commercial and residential customers to participate like large customers currently can. Moreover, although a demand response program should call on larger customers with accessory or

49 ConEd. (2024). *Commercial System Relief Program (21 Hour Notification Program): Event Call Windows for 2024*. https://www.coned.com/-/media/files/coned/documents/save-energy-money/rebates-incentives-tax-credits/smart-usage-rewards/networks-and-tiers.pdf. The ten Tier 2 networks are selected based on a three-year average of the ten networks with the worst Network Reliability Indices (NRIs). See New York State Public Service Commission, "CASE 17-E-0741 - Petition of Consolidated Edison Company of New York, Inc. for Approval of Changes to Commercial Demand Response Programs: ORDER APPROVING CHANGES TO COMMERCIAL DEMAND RESPONSE PROGRAMS WITH MODIFICATIONS."

50 Id.

51 ConEd. (2024). *Commercial System Relief Program (21 Hour Notification Program): Event Call Windows for 2024*. https://www.coned.com/-/media/files/coned/documents/save-energy-money/rebates-incentives-tax-credits/smart-usage-rewards/networks-and-tiers.pdf.

52 ConEd. (2024, March 18). *Smart Usage Rewards (Demand Response) Aggregator List.* https://bit.ly/3BfAEtl.

nonessential energy consumption to manage their electricity first, customers in certain networks who have greater necessity to manage their electricity use (due to past network unreliability) should be compensated at higher rates.

How a demand management program is marketed must account for the unequal adoption of DERs and electric appliances in low-income communities. For instance, a program can bundle existing DER and electrification incentives with default demand management program opt-in that enables small commercial and residential customers to benefit considerably from incentive payments. However, third-party aggregators and utilities themselves should have strong consumer protections and verification of vendors and additional incentives for LMI ratepayers to participate in demand response activations, as demonstrated by Massachusetts ConnectedSolutions program.[53] These practices must be communicated transparently and have streamlined ways for households to participate. There must be a careful balance between prioritizing demand management while ensuring that resources are not depleted in the event of a blackout or meeting minimum mobility, safety, and medical needs. Failure to do so runs the risk of alienating customers and discouraging new entrances into the programs.[54]

In addition to the direct benefits to marginalized communities that a demand management program can deliver, it is important to consider the indirect benefits that the widespread adoption of DERs and demand management mechanisms can provide, such as increased opportunities for skilled trades such as electricians, electrical contractors, and IT technicians. A grid managed with a higher number of DERs could generate significantly more family-sustaining, full-time careers than a grid reliant on utility-scale assets alone.[55] Worker training and apprenticeship programs, particularly if they are developed in partnership with existing certification programs through organizations like the International Brotherhood of Electrical Workers (IBEW) and the National

Battery storage installation that is paired with rooftop solar at the Marcus Garvey Apartments affordable housing complex in Brooklyn. Developing DERs serving affordable housing complexes is one way to reduce barriers to demand response participation.
PHOTO: ENEL X.

53 Olinsky-Paul, Todd. (2021, August 5). Energy Storage Policy Best Practices from New England: Ten Lessons from Six States. *Clean Energy Group/Clean Energy States Alliance*. https://www.cesa.org/resource-library/resource/energy-storage-policy-best-practices-from-new-england.

54 St. John, Jeff. (2024, September 11). Here's a blueprint for building virtual power plants in every state. Canary Media. https://www.canarymedia.com/articles/virtual-power-plants/heres-a-blueprint-for-building-virtual-power-plants-in-every-state.

55 Downing et al. (2023, September). Pathways to Commercial Liftoff: Virtual Power Plants. *U.S. Department of Energy*. https://liftoff.energy.gov/wp-content/uploads/2023/09/20230911-Pathways-to-Commercial-Liftoff-Virtual-Power-Plants_update.pdf.

Electrical Contractors Association (NECA), can create valuable pathways for community members to actively participate in and benefit from a clean energy transition. Existing programs such as NYSERDA's On-the-Job Training Program, which provides partial wage reimbursement to energy service providers to hire and provide on-the-job training for full-time new workers, can be leveraged to develop robust workforce development pipelines and ensure there is an adequate workforce to manage a more distributed and highly managed grid.

In addition to the direct benefits to marginalized communities that a demand management program can deliver, it is important to consider the indirect benefits that the widespread adoption of DERs and demand management mechanisms can provide, such as increased opportunities for skilled trades such as electricians, electrical contractors, and IT technicians.

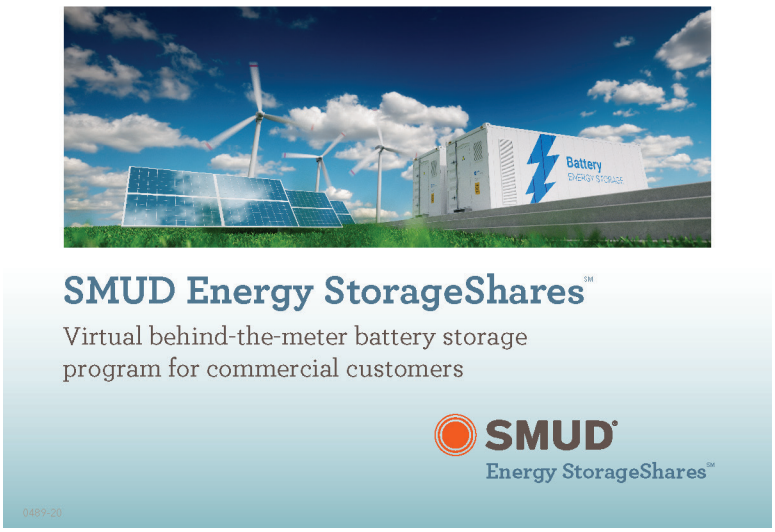
BARRIERS TO DEMAND MANAGEMENT FOR ENERGY JUSTICE

Perhaps the two largest barriers to scaling up demand management in an equitable way are the lagging adoption of DERs by low-income and people of color households and issues of transparency and trust with utilities. Demand response and VPPs can be tools to address these barriers. Demand response program incentives—particularly those with equity-focused provisions such as adders for income-eligible participants or commercial entities serving disadvantaged communities, up-front payment incentives for income-eligible participants, or carve outs for income-eligible participants—can improve economic outcomes for DER projects in LMI communities, which typically face greater obstacles to obtaining financing due to perceived risk.[56] Programs should offer substantial upfront and performance-based incentives to maximize the value-add of demand response to DER project financing in marginalized communities. It is also important to allow both owned and leased DER systems to participate in demand response programs, as many LMI customers may need to take advantage of leasing programs to afford access to battery storage systems or similarly expensive energy infrastructure.

While implementing equity-focused provisions into demand response program design can help address some of the barriers to DER deployment, additional structural barriers, such as low homeownership rates, can also be addressed. For example, supporting community-scale or community-owned battery storage projects can allow households to access demand reduction savings without directly owning a battery storage system. The Sacramento Municipal Utility District (SMUD)'s Energy StorageShares program, the first virtual storage program in the U.S., allows commercial customers to make an upfront payment to SMUD for program participation in exchange for a monthly on-bill credit for 10 years, reflecting the savings an onsite battery would have provided through demand reduction.[57] While Energy StorageShares targets commercial customers, a similar design should be utilized in New York to provide benefits for residential customers who cannot support onsite battery storage.

56 Olinsky-Paul, Todd. (2021, August). Energy Storage Policy Best Practices from New England: Ten Lessons from Six States. *Clean Energy States Alliance*. https://www.cleanegroup.org/wp-content/uploads/Energy-Storage-Best-Practices-from-New-England.pdf.

57 Costello, Maria Blais. (2020, July). *2020 State Leadership in Clean Energy Awards: Case Studies of Award-Winning Programs that Are Accelerating the Clean Energy Transition*. Clean Energy States Alliance. https://www.cesa.org/wp-content/uploads/2020SLICE.pdf.



SOURCE: SACRAMENTO MUNICIPAL UTILITY DISTRICT

Low-income communities and communities of color have long been treated as "sacrifice zones"[58] for building polluting fossil fuel assets in the name of maintaining grid reliability. From on-the-ground organizing experiences of organizations like UPROSE and The Point CDC, this legacy of harm means that many customers are unlikely to trust utilities like ConEd. Allocating funding to support the work of trusted community organizations that can engage and educate residents on how to access incentives or programs to support DER installation or energy efficiency upgrades, as well as how to enroll in demand management programs and receive benefits (if auto-enrollment in such programs is not available), is an important step in ensuring equitable outcomes. Access to support from a trusted community partner can also reduce obstacles to customer enrollment in available programs, such as lack of internet access or language barriers.

Demand response and VPPs can be tools to address these barriers. Demand response program incentives—particularly those with equity-focused provisions such as adders for income-eligible participants or commercial entities serving disadvantaged communities, up-front payment incentives for income-eligible participants, or carve outs for income-eligible participants—can improve economic outcomes for DER projects in LMI communities, which typically face greater obstacles to obtaining financing due to perceived risk.

The biggest impact demand management can have in environmental justice communities is the accelerated retirement of polluting fossil-fuel peaker plants without bulk electric transmission upgrades. However, these reductions and subsequent benefits can only be realized if utilities and grid operators such as NYSIO model and value demand management accurately and equitably in the context of CLCPA's zero-emissions by 2040 and environmental justice mandates. Traditional, archaic resource adequacy planning has tended to favor fossil fuel assets, but as more renewable generation comes online to meet the goals set by the CLCPA, the ability to quickly shift demand will become even more important for maintaining grid reliability, particularly in capacity constrained areas. Nationwide, coincident peak demand is expected to rise by approximately 60 GW, from 740 GW to 800 GW of demand, by 2030. With the continued retirement of fossil fuel assets (including those in New York), at least 200 GW of that demand will need to be met by new resources.[59] Demand-side management programs will play a vital role in addressing some of this peak demand while saving billions of dollars in grid costs.

58 Scott, Dayna Nadine and Adrian A. Smith. (2017). *Sacrifice Zones' in the Green Energy Economy: Toward an Environmental Justice Framework*. 62:3 McGill LJ 861. https://doi.org/10.7202/1042776ar.

59 Downing et al.

Regulatory Landscape and Legal Reform

BASELINE: UTILITIES HAVE THE WRONG INCENTIVE

Despite the economic, environmental, and equity-driven benefits of demand management, New York State's current regulatory scheme provides investor-owned utilities with no incentive to invest in demand management infrastructure more broadly. In fact, utilities have an incentive to do just the opposite: make capital investments in fossil fuel infrastructure and traditional "poles and wires" solutions, pass on the costs to the ratepayer, and earn a hefty profit. This can be attributed to the makeup of monopolistic utility ownership and the current limits of utility regulation.

The utility industry is often called a "natural monopoly" because competition between utility companies would result in "duplication of expensive infrastructure and higher costs for customers."[60] Utilities fall into one of three major categories: cooperatives (co-ops), publicly owned utilities (POUs), and investor-owned utilities (IOUs).[61] Co-ops are not-for-profit, member-owned utilities; and POUs are utilities run by federal, state, or municipal entities.[62] Investor-owned utilities, which are large electric distributors beholden to their shareholders, serve about 72 percent of U.S. electricity customers.[63]

As of 2023, "[n]early two-thirds of Americans receive their electricity from for-profit corporations granted a monopoly over electricity distribution."[64] The objective for IOUs is simple: to increase shareholder value.[65] IOUs thus have to answer to their shareholders, while ratepayers—the households and businesses that pay for utility services—have no voice in how such a utility is operated.[66] Promises for cost efficiency, innovation, and expertise are difficult to measure in light of the reality of higher prices, lack of competition to innovate, and lack of local accountability.[67] Without a direct voice, ratepayers are supposedly protected by the regulation and oversight of a public utility commission, which in New York State is administered through the Public Service Commission (PSC).[68]

60 Nagra, Ruhan, Jeanne Bergman, Jasmine Graham. *Regulatory Theater: How Investor-Owned Utilities and Captured Oversight Agencies Perpetuate Environmental Racism*, 25 CUNY L. Rev. 355, 357 (2022). https://academicworks.cuny.edu/clr/vol25/iss2/6/.

61 U.S. Energy Information Administration. (2023, October). *Annual Electric Power Industry Report*. https://www.eia.gov/electricity/data/eia861.

62 Id.

63 Id.

64 Farrell, John. (2023, August 30). How Private Monopolies Fuel Climate Disaster and Public Corruption. *The American Prospect*. https://prospect.org/environment/2023-08-30-private-monopolies-fuel-climate-disaster-public-corruption.

65 Nagra, Ruhan, Jeanne Bergman, Jasmine Graham. (2022). *Regulatory Theater: How Investor-Owned Utilities and Captured Oversight Agencies Perpetuate Environmental Racism*, 25 CUNY L. Rev. 355, 358.

66 Id. at 358

67 Stein, Z. (2024, September 24). *Investor-Owned Utilities (IOUs)*. Carbon Collective. https://bit.ly/4gwA22r.

68 Nagra et al. at 358.

The PSC's primary instrument of regulation and oversight of utilities is the rate case. A rate case refers to the "formal process used to determine the amounts to charge customers for electricity, natural gas, private water and steam service provided by utilities."[69] New York law declares that the continued provision of these services is "necessary for the preservation of the health and general welfare,"[70] and the PSC is charged with ensuring that utilities meet the standards of "safe and adequate service" as well as "just and reasonable charges" in their provision of these necessities.[71] The PSC has a responsibility that is primarily "economic in nature" but the scope of their regulatory impact extends far beyond rates, because through a rate case the Commission also oversees "processes for resource planning, procurement, and management," the setting of clean energy targets, budgeting, determining sources of funding, as well as developing utility incentives for energy efficiency.[72] The PSC's rate-setting has a broad impact that heavily influences utilities' clean energy transition—or lack thereof; however, the PSC's process fails to incorporate this broad set of concerns.

In fulfilling its primary economic responsibility of setting rates, the PSC is required to reach a "just and reasonable result," but is not bound to consider specific factors.[73] Under the PSC's current structure for rate setting, IOUs are allowed to turn a profit from capital expenses, such as a new substation, but not for operating expenses, such as a program which rewards utility customers for using energy efficient technology or participating in demand response programs.[74] Shareholder demands incentivize IOUs to continually request a rate increase for more capital expenses rather than making operational changes in order to meet service needs. Even if an IOU can meet customers' energy needs with minimal capital expenditure, such as a demand management program in which customers would be rewarded for using less electricity during times of peak demand, the IOU is incentivized to do the opposite and build more expensive energy infrastructure. This comes at a huge and unnecessary cost to the environment and at the ratepayer's expense.[75]

Under the PSC's current structure for rate setting, IOUs are allowed to turn a profit from capital expenses, such as a new substation, but not for operating expenses, such as a program which rewards utility customers for using energy efficient technology or participating in demand response programs.

The PSC has departed from this inefficient and harmful structure before and should continue to do so. In ConEd's 2013 rate case, the agency "ordered ConEd to look at non-traditional investments as ways to manage demand growth" and allowed ConEd to turn a profit on these non-traditional investments, which included the Brooklyn-Queens Demand Management Program (BQDM).[76] BQDM replaced ConEd's initial rate case request of a new

69 New York State Department of Public Service. (2024). *Pending and Recent Electric Rate Cases*. https://dps.ny.gov/pending-and-recent-electric-rate-cases.

70 N.Y. Pub. Serv. Law § 30 (McKinney). https://casetext.com/statute/consolidated-laws-of-new-york/chapter-public-service/article-2-residential-gas-electric-and-steam-utility-service/section-30-residential-gas-electric-and-steam-service-policy.

71 N.Y. Pub. Serv. Law § 65 (McKinney). https://casetext.com/statute/consolidated-laws-of-new-york/chapter-public-service/article-4-provisions-relating-to-gas-and-electric-corporations-regulation-of-price-of-gas-and-electricity/section-65-b-service-to-persons-applying-for-or-receiving-public-assistance-supplemental-security-income-benefits-or-additional-state-payments.

72 Nagra et. al.

73 General Motors Corp. v. Public Service Co¡mmission of State of N.Y. (3 Dept. 1983) 95 A.D.2d 876, 463 N.Y.S.2d 886, appeal denied 60 N.Y.2d 557, 469 N.Y.S. 2d 1025, 457 N.E.2d 808. https://case-law.vlex.com/vid/general-motors-corp-v-885441645.

74 Nagra et al. at 362.

75 Id. at 363.

76 Walton, Robert. (2019, February 6). Despite failures, ConEd targets more energy savings from non-wires pioneer BQDM. Utility *Dive*. https://www.utilitydive.com/news/despite-failures-coned-targets-more-energy-savings-from-non-wires-pioneer/547725.

The CLCPA mandates GHG emissions reductions from peaker plants like the Vernon Blvd. peaker in Queens. PHOTO: COSTA CONSTANTINIDES, OFFICE OF NYC COUNCIL MEMBER

substation. The program was able to meet rising demand at a reduced cost and has been called a success "[b]y almost any measure."[77] When the PSC used its latitude to reward—and require—non-capital expenditures to meet demand growth, it worked. This atypical rate case demonstrates just how backward the typical incentives are when it comes to IOUs and provides a blueprint for how rate cases can yield better results for the environment and the ratepayer. Most importantly, it shows there is nothing holding back the PSC from thinking, planning, and regulating New York's landmark climate and environmental laws, detailed below, *require* the agency to do so.

Starting in 2019, New York State ushered in a new era of climate leadership and governance with the passage of the CLCPA. This law mandates significant GHG emission reduction by 2030, and CLCPA Section 7(2) requires state agencies and other state entities to make decisions which are consistent with those GHG emission limits.[78] The CLCPA creates further protections for Disadvantaged Communities, prohibiting state agencies and other entities from disproportionately burdening these communities in their decision making, and mandates a 100% zero emissions electricity sector by 2040. Since 2021, New Yorkers have had fundamental environmental rights enshrined in the state constitution via the Environmental Rights Amendment (ERA), which guarantees each person a right to "clean air, clean water, and a healthful environment."[79] Like all other state agencies, the PSC

77 Id.

78 CLCPA §7(2) states: "In considering and issuing permits, licenses, and other administrative approvals and decisions, including but not limited to the execution of grants, loans, and contracts, all state agencies, offices, authorities, and divisions shall consider whether such decisions are consistent with or will interfere with the attainment of the statewide greenhouse gas emissions limits established in article 75 of the environmental conservation law."

79 New York State Constitution. Art. 1, §19. https://dos.ny.gov/system/files/documents/2024/09/constitution-january-1-2024.pdf.

is bound by these legal and constitutional requirements in its decision-making, including but not limited to the rate case process. The New York State Department of Environmental Conservation (DEC) has already demonstrated that the CLCPA gives them the authority to deny permits to facilities that constitute significant new GHG emission sources, and a court upheld that analysis, but there is limited precedent as to what the CLCPA requires in other decision-making.[80] The ERA likewise has been found to be a substantive, self-executing right, which requires no enabling legislation in order to be actionable, and which expands upon existing rights.[81]

The PSC has yet to demonstrate a strong commitment to its mandate under the CLCPA. In a July 2024 report, the agency acknowledged that the state is unlikely to reach its renewable electricity targets and suggested that the timeline be delayed by at least three years.[82] The PSC is embracing its alleged authority to move the target, all the while its individual actions, and lack thereof, are inconsistent with the law. The Commission has the sole responsibility to "establish a program to achieve the zero-emissions target," yet as of June 2024 the Commission had not proposed a single rule to help meet that target.[83] In August of 2024, the Commission finally commenced a "Proactive Grid Planning Proceeding" to support electrification and grid infrastructure needs "in pursuit of the Climate Act goals."[84]

The PSC must act innovatively to meet the moment and comply with upcoming CLCPA mandates. This includes altering the way the agency regulates utilities. Simply allowing utilities to expand traditional infrastructure and invest in more fossil fuels increases GHG emissions and is thus inconsistent with the law. It cannot continue. While the PSC has the vital and challenging role of ensuring adequate gas and electric service, that does not mean that each decision made in the name of reliability will be justified under the law. Forcing utilities to invest in demand management programs such as demand response and VPPs is clearly consistent with the CLCPA because of its proven potential to reduce GHG emissions, yet it is severely underutilized in New York. As the PSC looks toward solutions to ensure reliable service without running afoul of the law or sacrificing climate vulnerable communities, the agency ought to compel New York's utilities to invest in demand management.

PUBLIC INTERVENTIONS TO ADVOCATE FOR CHANGE

Rate Cases

The primary way for the public to influence the PSC, and thus influence the utilities that the PSC regulates, is through intervening in a rate case. Public intervention in a rate case—from individual households to large environmental nonprofits—provides one avenue for changing the planning and behavior of utilities. Yet this avenue is often inaccessible and limiting.

80 Ibid.

81 Id.

82 French, Marie J. (2024, July 2). New York Likely to Miss 70 Percent Renewable Target. *Politico*. https://www.politico.com/news/2024/07/02/new-york-likely-to-miss-70-percent-renewable-target-00166258.

83 *New York State Pub. Serv. Commission v. FERC, 104 F.4th 886 (D.C. Cir. 2024).* https://ferc.gov/media/new-york-state-public-service-commission-v-ferc-0.

84 New York State Department of Public Service. (2024, August 15). *Commission Announces New Proactive Grid Planning Proceeding to Prepare New York's Electric Grid for Building and Vehicle Electrification*. https://dps.ny.gov/news/commission-announces-new-proactive-grid-planning-proceeding-prepare-new-yorks-electric-grid.

What is a Rate Case?

A rate case is a formal proceeding through which the Department of Public Service, the "staff arm" of the PSC, determines the amount that utilities may charge for electricity, natural gas, private water and steam service.[85] Rate cases begin when a utility submits a filing to demonstrate the need to increase rates, and the filing must include the following:

- **Estimates of expenses**
- **Depreciation costs**
- **Taxes**
- **A return on investor-provided capital**
- **Recognition of utility plant additions and capital expenditures[86]**

Rate cases also allow for intervenors to become parties in the proceeding, and typical intervenors include "industrial, commercial and other large-scale users of electricity; public interest groups; representatives of residential, low-income and elderly customers; local municipal officials; and dedicated advocacy groups."[87] To intervene, prospective parties need to submit a "Party Status Request Form."[88]

Rate cases are overseen by an administrative law judge, and the New York State Department of Public Service (DPS) also creates its own team to scrutinize the utilities' proposal, which often includes "lawyers, accountants, engineers, economists, financial analysts and consumer service specialists."[89] DPS is charged with both analyzing the utility's filing and representing "the public interest."[90] The state Division of Consumer Protection's Utility Intervention Unit (UIU) also participates in rate cases to "represent the interests of New York consumers."[91] However, the UIU is charged with representing the interests of both residents and businesses—both of whom are electricity consumers—even though these groups may desire vastly different outcomes.[92] Despite the public interest being represented by multiple parties, utilities apply for rate hikes "in a constant cycle, and regulators almost always approve them in some modified form."[93] And even though outside parties can intervene, the current PSC commissioner himself has said that "[w]hile any party can participate, the path to meaningful engagement is fraught with obstacles that perplex the uninitiated and often test the patience of seasoned participants," and "parties and individuals who have long participated . . . possess an undeniable advantage over newcomers."[94]

Intervenors are full parties to a rate case and have the right to discovery, cross examination, presenting expert witnesses, and other aspects of adjudication. Parties can read filings by the utility company, DPS, and other parties, and have access to any discovery responses, in addition to filing their own briefs during evidentiary processes in support or opposing the joint proposal.[95] Parties do not have to participate in all of these matters,

85 Department of Public Service.

86 Id.

87 Id.

88 The Party Status Request Form can be found here: New York State Department of Public Service. *Service List and Party Status Request forms*. https://dps.ny.gov/service-list-and-party-status-request-forms (last visited May 16, 2024).

89 New York State Department of Public Service. *Major Rate Case Process Overview*. https://dps.ny.gov/major-rate-case-process-overview (last visited May 16, 2024).

90 Id.

91 New York State Department of State. *Utility Intervention Unit*. https://dos.ny.gov/utility-intervention-unit-1 (last visited May 16, 2024).

92 Nagra et al.

93 Kinniburgh, Colin. (2032, August 7). Why Your Energy Bills are Going up. *New York Focus*. https://nysfocus.com/2023/08/07/energy-bill-rate-hikes-psc-coned.

94 Id.

95 Rate Cases 101. (2023, July 27). *Public Utility Law Project of New York*. https://utilityproject.org/rate-cases-101.

and the level of participation may vary based on resources, knowledge, or interest.[96] The initial filing for a rate case "forms the basis of all future testimony and negotiations in the case," thus giving the utility enormous power in framing the proceeding.[97] The active participation of many parties, who can share perspectives to counter the utility's claims and emphasize the burden borne by ratepayers, can be powerful.[98]

Intervenor parties often face limitations due to a lack of resources, which can have a limited impact on the result. While utilities hire lawyers to make their case for cost increases, advocate intervenors are not paid for being party to a rate case, unlike other select proceedings such as Article X. Sixteen other states have laws that authorize intervenor funding, including six "active, effective programs" in California, Wisconsin, Idaho, Michigan, Minnesota, and Oregon.[99] New York's intervenor funding bill, first introduced in 2009, would compensate intervenors who are advocates of customers (including small businesses) "for fees, expert witnesses, and other reasonable costs."[100] The bill failed to pass the legislature year after year, and when it finally passed in 2022, it was vetoed by Governor Kathy Hochul.[101] The lack of intervenor funding presents a major barrier to meaningful involvement and accountability of utility rates to the general public.

Clean Energy Proceedings

Since the passage of the CLCPA, the PSC has also held Clean Energy Proceedings. These proceedings are part of the process by which the PSC seeks to meet its statutory mandates, which require the agency to establish a program in which 70 percent of the electricity load is supplied by renewable energy in 2030 and in which there are zero emissions associated with electrical demand by 2040.[102]

The proceedings are broken down into numerous areas with their own dockets and opportunities for public comment, including but not limited to the Clean Energy Standard and the Value of Distributed Energy Resources (VDER). The VDER case, which "addresses the mechanism to compensate energy generated by distributed energy resources such as solar photovoltaic, energy storage, combined heat and power, anaerobic digesters, wind turbines and small hydro and fuel cells," has the potential to greatly increase incentives for resources that could participate in VPPs. While the updated docket shows that many public comments have been submitted and 97 parties are registered in the proceeding,[103] the process, scope, and timeline of the proceeding are not readily accessible to the public.

96 Id.

97 Negra et al.

98 Public Utility Law Project. (2024). *Public Utility Law Project of New York*. https://utilityproject.org/.

99 Nagra et al.

100 Berkley, Richard, and Alicia Landis. "Viewpoint: A chance to give consumers a voice in utility rate cases." *Times Union.* March 21, 2022. https://www.timesunion.com/opinion/article/Viewpoint-A-chance-to-give-consumers-a-voice-in-17015577.php

101 Id.

102 New York State Public Service Law Section 66-p. (2023, May 12). *Establishment of a renewable energy program*. Public Service (PBS) Chapter 48, Article 4. https://www.nysenate.gov/legislation/laws/PBS/66-P.

103 New York State Department of Public Service. (2015 – 2024). *Petition. In the Matter of the Value of Distributed Energy Resources*. Matter Master: 15-02703/15-E-0751. https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-E-0751.

LEGISLATIVE REFORM AND RESTRUCTURING

Under the Public Service Law, the PSC possesses "the very broadest of powers to regulate rates, service classifications and regulations of a corporation which sells electricity to the public."[104] Courts have found that the agency is authorized to consider the economic impact of utility rates upon different classifications of ratepayers,[105] to subsidize one classification of ratepayer by another,[106] and to require energy service contracts to guarantee customers savings or provide at least 30 percent renewable energy.[107] While the PSC has the broad authority to set rates and regulate utilities in a manner that prioritizes environmental and economic justice, it also has enormous discretion in exercising its authority and most often fails to prioritize these issues. Legislative reform to the Public Service Law could explicitly require that the PSC prioritize utility investments that do not require new fossil fuel infrastructure or require a showing that utilities have maximized opportunities to shave off peak demand through operational changes—such as demand response, VPPs, and energy efficiency programs—before allowing profit-raising capital expenditure on fossil fuel infrastructure. Legislative reform could also change the incentive structure, even making it possible for utilities to yield higher profits from investments that do not increase greenhouse gas emissions.

Legislative reform to the Public Service Law could explicitly require that the PSC prioritize utility investments that do not require new fossil fuel infrastructure or require a showing that utilities have maximized opportunities to shave off peak demand through operational changes—such as demand response, VPPs, and energy efficiency programs—before allowing profit-raising capital expenditure on fossil fuel infrastructure.

During ConEd's last rate case, in which the utility sought and received approval for significant rate increases, many legislators spoke out against the huge price hike and called for a public hearing to provide constituents with the chance to weigh in on the proposed rate hike.[108] The PSC held public hearings and still approved an electricity rate increase of 12 percent over three years.[109] While it is promising for legislators to take on the role of ratepayer advocate, recent history shows a need to amend the Public Service Law to structurally alter the process, and that is something only the legislature can and must do.

Most VPP programs in other states have grown out of utility proposals or regulatory mandates.[100] Yet in some states, including Colorado and Maryland, the legislatures enacted laws that require VPP programs.[111] The Colorado law specifically singles out "an investor-owned electric utility that services 500,000 customers or

104 *Campo Corp. v. Feinberg* (3 Dept. 1952) 279 A.D. 302, 110 N.Y.S.2d 250. https://casetext.com/case/matter-of-campo-corp-v-feinberg.

105 Multiple Intervenors v. Public Service Com'n of State of New York, 2002, 194 Misc.2d 85, 750 N.Y.S.2d 480. https://www.casemine.com/judgement/us/5c3d77d9342cca0a388cea1d/amp.

106 Id.

107 *Order on Rehearing, Reconsideration, and Providing Clarification*. Effective September 18, 2020. Retail Energy Supply Ass'n v. Public Service Com'n of State (3 Dept. 2017) 152 A.D.3d 1133, 59 N.Y.S.3d 590.

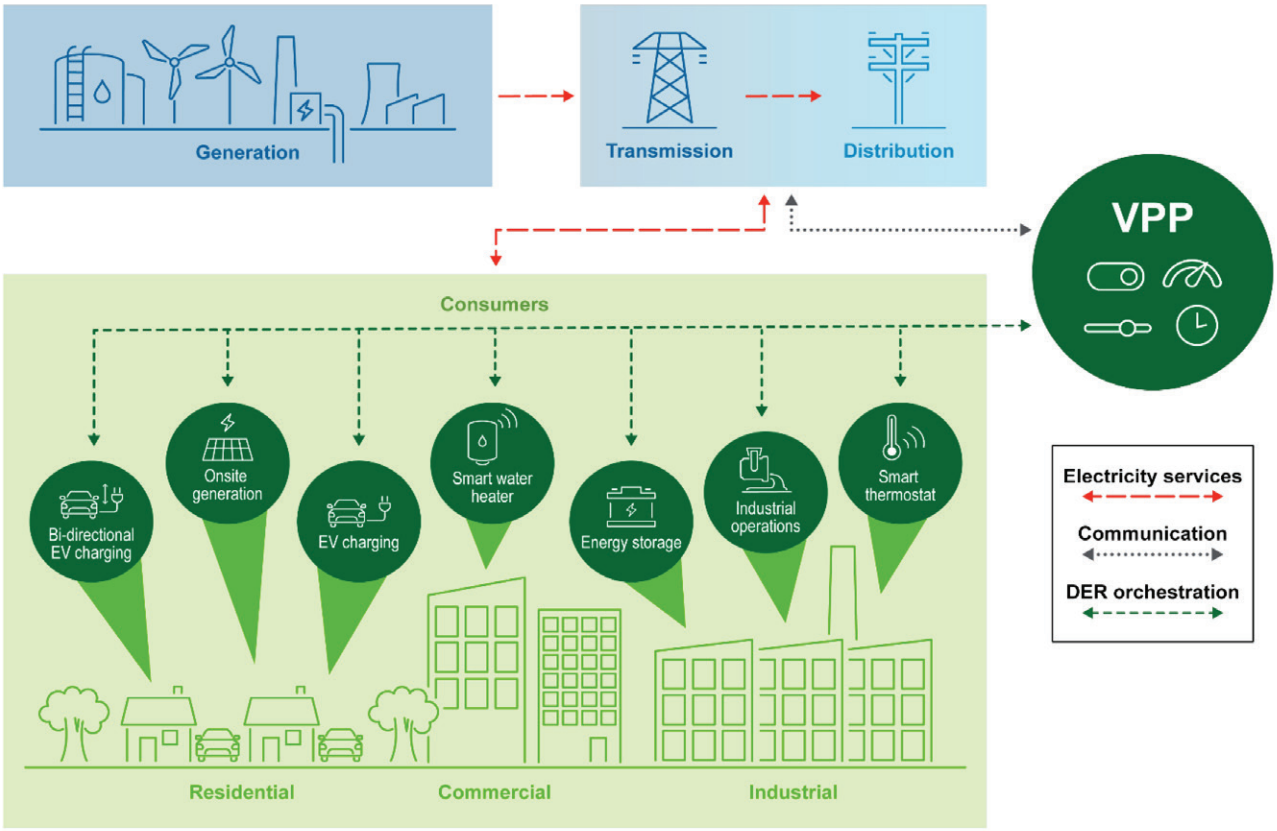
108 The New York State Senator Michael Gianaris. (2022, September 26). *Senate Deputy Leader Gianaris, Assembly Member Mamdani Lead Over 50 Legislators Demanding PSC Hold an Additional Hearing Before Con Edison Raises Customer Rates* [Press Release]. https://www.nysenate.gov/newsroom/press-releases/2022/michael-gianaris/senate-deputy-leader-gianaris-assembly-member-0.

109 Maldonado, Samantha. (2023, February 23). Rate Hike in Pipeline for Con Ed Customers. *The City Report, Inc*. https://www.thecity.nyc/2023/02/23/rate-hike-con-edison.

110 St. John, Jeff.

111 Id.

FIGURE 7. **How a Virtual Power Plant Works**



Source: U.S. Department of Energy, "Pathways to Commercial Liftoff: Virtual Power Plants" at https://liftoff.energy.gov/wp-content/uploads/2023/10/LIFTOFF_DOE_VVP_10062023_v4.pdf.

more in the state,"[112] which has been identified as Xcel Energy.[113] It requires, among other things, that the utility "create and file with the commission an application to implement a virtual power plant program" by January 1, 2025.[114]

In Maryland, the legislature took a different approach and directed the state's Public Service Commission to adopt regulations to expedite processes for "interconnecting bidirectional electric vehicle systems to the grid," as well as to direct IOUs to create pilot programs to compensate owners of DERs.[115] One of these laws directly aims at an IOU, while the other forces the regulatory power to take certain steps. Both laws alter the landscape in their jurisdictions by understanding and addressing a key issue: IOUs have no incentive to create these programs unless they are forced to by the state. These laws may be some of the first to mandate VPPs in such clear terms, but they are unlikely to be the last. Canary Media reported that Solar United Neighbors collaborated with a clean energy law firm and "leading battery installers" to create model legislation and a model tariff on the topic.[116]

112 Colorado General Assembly. (2024). *Modernize Energy Distribution Systems*. (SB24-218). State of Colorado. https://leg.colorado.gov/bills/sb24-218.

113 Martucci, Brian. (2024, May 24). *Colorado law requires Xcel VPP program by February with performance-based tariff. Utility Dive*. https://www.utilitydive.com/news/xcel-energy-colorado-law-vpp-virtual-power-plant-der-distributon-system-grid-interconnection/717429/.

114 Colorado General Assembly.

115 Maryland General Assembly. (2024). *Electricity—Tariffs, Distributed Energy Resources, and Electric Distribution System Support Services (Distributed Renewable Integration and Vehicle Electrification (DRIVE) Act).* (House Bill 1256). Maryland Department of Legislative Services. https://mgaleg.maryland.gov/2024RS/fnotes/bil_0006/hb1256.pdf.

116 St. John, Jeff.

Towards a Just Future with Energy Demand

In September 2024, New York State kicked off a new State Energy Plan process. The Plan has received few updates since 2015 and now aims to lay out a comprehensive strategy towards zero-emissions electricity by 2040 and incorporate objectives and strategies laid out in the CLCPA implementation process to date. As the process unfolds in the next few months, it is imperative that a new understanding of energy regulation and demand management become part of the broad vision for the future of New York state's energy sector. Demand management is an all-hands-on-deck exercise, and every member of the State Energy Planning Board, from leaders of state departments to elected official appointees, must seriously incorporate demand management programs into their decision-making processes.

Stakeholders in energy governance must continue to work and ensure that demand management programs are achieving their potential in New York. Low-income residents and people of color—who suffer disproportionate ill effects of air pollution

Low-income residents and people of color—who suffer disproportionate ill effects of air pollution and the highest heat vulnerability index scores—must be prioritized in any demand management programs.

UPROSE staff at the Climate Justice Lives Here! Festival, Brooklyn, NY, September 2024. The festival celebrates the pivotal role of frontline communities in advancing climate justice. PHOTO: UPROSE

and the highest heat vulnerability index scores—must be prioritized in any demand management programs. A well implemented demand management program could achieve four key objectives:

1. Reduced greenhouse gas and co-pollutant emissions through reduced fossil fuel power plant operations and accelerated retirement. This is especially critical in the short term to reduce the possibility for any unnecessary extensions to the continued operation of existing fossil fuel generation facilities.
2. Increased reliability and resilience of New York's grid. The chances of blackouts and brownouts can be reduced or eliminated to the best extent possible, including during times of natural disaster when some fossil fuel power plants may become unavailable.
3. Community investments and participation in benefits such as workforce retention and creation associated with demand response and vitual power plant development, particularly in areas impacted by historic or ongoing power plant emissions, as well as increased consciousness of energy use issues and best practices. This will require new, smarter ways of thinking and incorporating rising talent, technology, and innovations into critical infrastructure.
4. Increased energy affordability and price stability because of compensation for demand management, time-of-use rates, shifts in energy demand, reduction of overall demand, or increases in energy supply.

New York States's energy governance structures must think proactively and shift rapidly to address historical environmental burdens, build community resiliency, fully implement the Climate Act, and combat the climate crisis. As the PEAK Coalition has illustrated in this report, demand management can play a critical role in rapidly addressing New York's skyrocketing demand for electricity and needs to be treated as a vital tool to meet decarbonization goals. Adhering to outdated norms regarding energy supply and demand will only serve to delay necessary action and maintain polluting fossil-fuel infrastructure longer than necessary. The PEAK Coalition hopes this report will inspire lawmakers, regulators, and state agencies to think beyond traditional energy planning and consider the urgent necessity for demand management programs that benefit disadvantaged communities, the existing barriers that can be overcome, and how might New York take steps toward better implementing and scaling demand management systems.

APPENDIX A

Demand Response Data and Equity Explainer

EXAMINING EQUITY IN DEMAND RESPONSE DATA

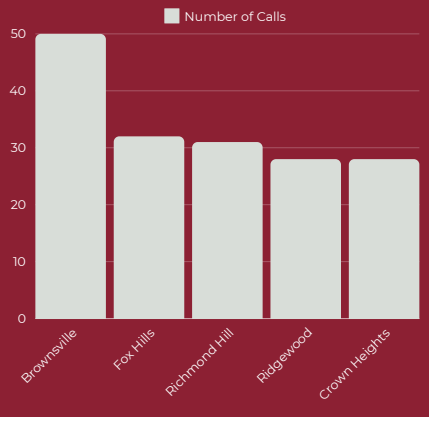
We took a look at New York City's peaker plant data to illuminate weather, neighborhood, and demographic patterns in the city's ongoing demand response programs.

OBSERVATIONS

Of the 655 calls from 2011 to 2023, 36% reached all NYC neighborhoods. The majority of demand response calls, however, were neighborhood-specific- calling on one region in particular to pitch in and help reduce the city's electricity demand.

Demand response calls were most frequent during the hottest summer days. In July and September of 2023, as highs reached the nineties for days on end, all New Yorkers were called upon on to decrease electricity expenditure.

MOST FREQUENTLY CALLED UPON NEIGHBORHOODS (2011-2023)



In the past 12 years, the following neighborhoods were only called once: Times Square, Sutton, Rockview, Washington Street, and City Hall.

KEY TERMS & FREQUENTLY ASKED QUESTIONS

Demand Response Calls: A phone alert from an energy corporation asking consumers to lower energy expenditure in order to reduce strain on the electricity grid and prevent blackouts.

Disadvantaged Communities (DACs): "Communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socio-economic criteria, or comprise high-concentrations of low- and moderate-income households." ECL § 75-0101(5)

Who makes the calls? Utilities & Grid Operators: Consolidated Edison (ConEd) and NYISO

Heat Vulnerability Index: "A metric of neighborhoods whose residents are more at risk for dying during and immediately following extreme heat. The factors included in the HVI are surface temperature, green space, access to home air conditioning, and the percentage of residents who are low-income or non-Latinx Black." NYC Mayor's Office of Climate & Environmental Justice

NEIGHBORHOOD ANALYSIS:

HEAT VULNERABILITY INDEX*

Brownsville

5 out of 5. Higher surface temperatures during the daytime characterize neighborhood conditions that create the *highest risk* for heat-based illnesses and heat-related mortality.

Richmond Hill, Crown Heights, Fox Hills

4 out of 5. Less vegetation and green space, among other factors, created *increased risk* for heat-related mortality.

Ridgewood

2 out of 5. *Lower risk* for heat-related mortality due to lower daytime surface temperatures and more green space.

*https://ehp.niehs.nih.gov/doi/10.1289/ehp.1408178 8A Case-Only Study of Vulnerability to Heat Wave-Related Mortality in New York City (2000-2011)
HVI data for Fox Hills is taken from neighboring Clifton neighborhood due to insufficient available public data.

SIGNIFICANCE

2023 broke demand response program records with the highest number of calls for New Yorkers to reduce energy expenditure. Residential neighborhoods carry the brunt of this burden. The five most frequently called upon neighborhoods in demand response programs across the city lie in the outer boroughs, and all five communities intersect with state identified DACs.

Crucially, the most frequently called upon neighborhoods display disproportionately high rates of heat vulnerability, lack of access to green spaces, and, for some, lower socioeconomic standing. This highlights structural inequities surrounding the urban built environment and its correlation to high energy use.

In accordance rising temperatures, the CLCPA greenhouse gas emissions reduction mandates require increased electrification, and the energy grid sees increased demand year after year. Demand-side management continues to serve as an important tool to prevent blackouts and brownouts, but the state must not let residents of DACs bear the brunt of this burden.

As new renewable energy infrastructure is outpaced by additional strain on the energy grid, demand response becomes an increasingly viable and necessary intervention. DACs do not serve to fill in the gaps for powerful utilities and government entities. Additional clarity is necessary on the internal policies dictating demand response calls, but the disparate impact on DACs is clear.

Ultimately, demand response is an effective and necessary way to combat energy inefficiency at the city and state level. However, it is crucial that stakeholders are intentional with equitably implementing the program — only then can we mitigate energy overconsumption and its effects on vulnerable communities.

Written by Makenzie Hymes & Esther Lau

INCOME LEVEL

The NYC city-wide median household income in 2022 was $77,550, and the poverty rate was 18.3%. Unless otherwise mentioned, all following statistics are from 2022.

Brownsville

Median household income: **$36,790** (-53% of city-wide)
Poverty rate: **39.1%**

Crown Heights

Median household income: **$81,600** (+5% of city-wide)
Poverty rate: **20.2%**

Richmond Hill

Median household income (2020): **$69,560** (-10% of 2022 city-wide)
Poverty rate (2020): **13%**

Fox Hills

Median household income: **$64,539** (-17% of city-wide)
Poverty rate (2021): **25.5%**

Ridgewood

Median household income: **$89,440** (+15% of city-wide)
Poverty rate: **11.3%**

CHARACTERISTICS

Brownsville

Brooklyn. Predominantly Black residential neighborhood; high concentration of public housing.

Crown Heights

Brooklyn. Diverse residential neighborhood with a sizeable, yet shrinking Black population. Some commercial areas.

Richmond Hill

Queens. Diverse neighborhood with significant Hispanic and Asian population; multi-generational households.

Ridgewood

Queens. Diverse residential neighborhood with some commercial areas; bordering Bushwick.

Fox Hills

Staten Island. Diverse neighborhood by Rosebank and nearby Clifton neighborhoods.

Income, socioeconomic, and racial & ethnic makeup data are approximations from the following sources:

- Brownsville: NYC Health Community Health Profiles: Brownsville
- Crown Heights: NYC Furman Center Neighborhood Profiles: Crown Heights/Prospect Heights
- Richmond Hill: NYC Small Businesses Services & Queens Economic Development Corporation: "Richmond-Hill Queens Commercial District Needs Assessment" + cityneighborhoods.nyc "Richmond Hill Queens"
- Fox Hills: Staten Island Explorer "Exploring Rosebank: Staten Island's Thriving Neighborhood" + NYC Environment and Health Data Portal: Tompkinsville-Stapleton-Clifton-Fox Hills
- Ridgewood: NYC Furman Center Neighborhood Profiles: Ridgewood/Maspeth

APPENDIX B

Potential of Demand Management in New York City

The following is a previously unpublished analysis of the potential impact of implementing demand management programs in New York City, prepared by Stratagen Consulting for the PEAK Coalition.

POTENTIAL OF DEMAND MANAGEMENT IN NEW YORK CITY

Demand management is the capability of reducing customers' load during times of system constraint, thus reducing the need for power generation and delivery capacity in the system and its associated costs. Today, many forms of demand management are available, from well stablished tools like time-of-use rates and demand response programs (generally focused on large customers) to nascent solutions like virtual power plant (VPP) platforms to aggregate and control distributed loads and generation. Improved planning and operation of the distribution system is also a way of managing load through markets and regulations. Furthermore, as end uses continue to electrify and appliances become "smarter," the capacity and capabilities of demand management solutions will increase rapidly.

To harness such potential, technological and regulatory innovations are needed. Virtual power plant (VPP) platforms are an example of a technology that allows the coordinated use of distributed appliances through smart meters and controls. Beyond distributed energy resource (DER) aggregation, VPPs aggregate the flexibility of small loads to provide demand management at the system level. On the regulatory side, the creation of a distribution system operator (DSO), an entity focused on the planning and management of the distribution system, could also leverage distributed loads to create flexibility in the system. In this sense, flexibility is the capability of moving energy demand in time to reduce system peaks and avoid related costs, a capability that is especially useful as electrification rapidly increases the demand for power from the distribution network.

New York City is one of such places, it concentrates a third of the power demand in NY State. In 2023 NYC had a peak demand of 10,360 MW during summer and 7,130 MW in winter. In its 2024 forecast, the NY Independent System Operator (NYISO) forecasted that by 2050 the peak power demand in the city will increase by 20% in summer and 100% in winter (45% and 170% respectively in High Demand Scenario), even after considering high contributions of energy efficiency. Most of this power demand is expected to come from rapidly electrifying sectors, specifically electric vehicles and building heat. Together, these sectors are expected to add 1,650 to 2,370 MW to the city's summer peak demand, and 8,450-11,920 MW to the winter peak demand by 2050.

Hence, the potential of demand management in NYC is a result of the capability of the system (technological and regulatory) to harness these growing resources to create flexibility from the customers' load. A 2024 study of the potential for load flexibility in Maine by Brattle proposed two scenarios of demand management capabilities. The base scenario assumes that 67% of the EV demand can be managed by delaying charging for up to 8 hours, and that 10% of heating demand can also be controlled for one hour. Its high flexibility scenario assumes that 100% of EVs and 50% of heaters could be managed during 24 and 2 hours, respectively. Applying these demand management assumptions, combined with the expected levels of electrification in NY City by 2050, specifically on electric vehicles and heating, results in a flexibility potential of 596 to 1,752 MW during summer (4,148 to 28,363 MWh), and 1,407 to 6,695 MW during winter (6,037 to 45,774 MWh).

Using this approach, Figure B1 shows the flexibility potential derived from the electrification of transportation and building sectors for NY State and NY City.

TABLE B1: **Flexibility potential from electrifying loads in New York City and New York State**

SUMMER								
Flexible Load Potential in New York State (Summer)								
Year	**New York State (Baseline)**				**New York State (High Flexibility)**			
2024	105	MW	843	MWh	169	MW	4,056	MWh
2030	794	MW	6,352	MWh	1,391	MW	33,384	MWh
2040	2,807	MW	22,453	MWh	5,622	MW	134,928	MWh
2050	3,753	MW	30,021	MWh	8,357	MW	200,568	MWh

WINTER								
Flexible Load Potential in New York State (Winter)								
Year	**New York State (Baseline)**				**New York State (High Flexibility)**			
2024	195	MW	1,563	MWh	313	MW	7,512	MWh
2030	1,233	MW	9,867	MWh	2,161	MW	51,864	MWh
2040	3,889	MW	31,109	MWh	7,788	MW	186,912	MWh
2050	4,933	MW	39,467	MWh	10,984	MW	263,616	MWh

SUMMER								
Flexible Load Potential in New York City (Summer)								
Year	**New York City (Baseline)**				**New York City (High Flexibility)**			
2024	15	MW	123	MWh	25	MW	600	MWh
2030	105	MW	843	MWh	185	MW	4,440	MWh
2040	376	MW	3,008	MWh	753	MW	18,072	MWh
2050	507	MW	4,059	MWh	1,130	MW	27,120	MWh

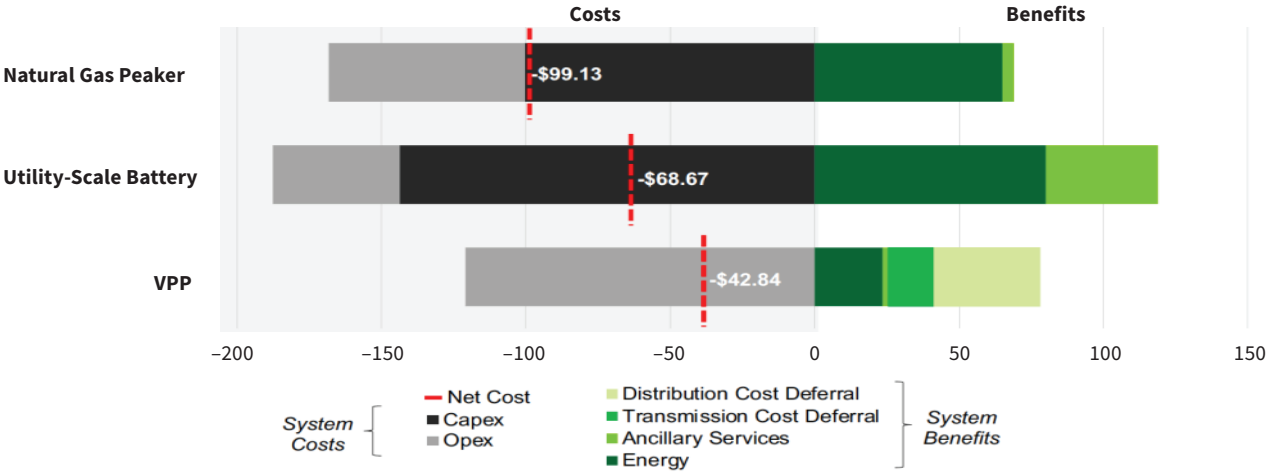
WINTER								
Flexible Load Potential in New Yortk City (Winter)								
Year	**New York City (Baseline)**				**New York City (High Flexibility)**			
2024	28	MW	224	MWh	45	MW	1,080	MWh
2030	160	MW	1,280	MWh	280	MW	6,720	MWh
2040	511	MW	4,091	MWh	1,024	MW	24,576	MWh
2050	661	MW	5,291	MWh	1,472	MW	35,328	MWh

Source: Strategen Consulting

In September 2023, the U.S. Department of Energy (DOE), published its report *Pathways to Commercial Liftoff: Virtual Power Plants.* The report describes the many costs and benefits of VPPs as a solution to alleviate future capacity needs and shows that they are the most affordable source of capacity after all costs and monetizable benefits are considered (net cost).

As shown in Figure B1, benefits of flexible loads represented by the VPP option include the deferral of investments on the transmission and distribution systems, as energy does not need to be transported when load flexibility is triggered to meet demand. In New York, for example, distribution system upgrade costs required for transportation electrification are estimated to be $1.4 billion if EV charging is managed, but up to $26.8 billion if not (NPV).[117] Other benefits not included in the net cost calculation are those of improved reliability and reliance, avoided emissions, and customer empowerment.

FIGURE B1. **Net cost to a utility in the U.S. of procuring peaking capacity (2022 $/kW-yr)**



Note: Net cost to a utility of procuring 400 MW of peaking capacity are shown in $/kW-yr in 2022 dollars. In the chart, the deferred T&D costs are represented as benefits of the VPP. Benefits of emissions reduction and resilience are not shown; when included, VPP net cost is lower, though actual emissions impact will vary by local grid mix. VPP in analysis consists of smart thermostats, smart water heating, home managed EV charging, and BTM battery demand response. Utility studied is assumed to have 50% renewable generation mix, with resource adequacy needs in summer and winter. DER penetration assumptions and VPP participation rates reflect national averages and utility experience. 8760 hours were considered and resources must be able to operate in 63 peak hours (when top 400 MW are needed) spanning 7 months, for 7 consecutive hours at a time. Costs exclude enabling grid software and hardware such as sensors and metering that would also contribute non-VPP services such as reducing reliance on meter readers, enabling timevarying rates, and data collection for energy use analytics. For detail on enabling grid software and hardware, see appendix Source: The Brattle Group, Real Reliability: The Value of Virtual Power (2023). Source: U.S. Department of Energy

Figure B1 also shows that meeting capacity needs always comes at a net cost. While the cost of supplying capacity through VPPs is $42,840 per MW-year, doing it using batteries is $68,670/MW-yr, while using gas peaker plants is $99,130 per MW each year. Considering the numbers for potential flexibility from electrifying loads in Figure B-1, the value of harnessing demand side management in NYC is in between $253 and $1,080 million (NPV for 2024-2050 period) when compared to the next best alternative for capacity, utility-level batteries, and in the range of $552 to $2,353 million when compared to a gas peaker alternative (Table B2).

TABLE B2: **Savings from using VPP for capacity instead of alternatives (2050 NPV in Millions $)**

VPP vs Battery Energy System (utility level)				VPP vs Natural Gas Peaker Plant			
NYS		NYC		NYS		NYC	
Baseline	High	Baseline	High	Baseline	High	Baseline	High
$1,359	$4,388	$253	$1,080	$2,961	$9,562	$552	$2,353

Source: Strategen Consulting

117 NYSERDA, 2022. Transportation Electrification Distribution System Impact Study. Report Number 22-13.

TAKEAWAYS FROM THE ANALYSIS OF POTENTIAL OF DEMAND MANAGEMENT IN NEW YORK CITY

1. NYC is unique from a power supply perspective. The city concentrates 42 percent of the State's population and one-third of its electricity demand. Its dense location limits the deployment of generating and transmission capacity, causing a growing need for local peaking capacity currently covered by gas-burning peaker plants.
2. Beyond gas peakers, demand management solutions can be used to cover the city's power needs while creating economic benefits to local NYC communities.
3. Demand management solutions include diverse energy technologies located at the customers premises (such batteries, solar panels, controllable devices, smart meters, etc.), that create flexibility on the use of energy by each customer.
4. The flexible capabilities of these technologies can be aggregated and used at the system level through enabling technologies, markets, and frameworks, such as virtual power plant technologies, distributed system operator frameworks, and wholesale markets open for DER aggregations.
5. As electrification and DER technologies take off, demand side management (DSM) solutions will continue to provide growing flexibility value to the system. These have the greatest potential to provide flexibility:
   a. Electric vehicles
   b. BTM batteries and paired solar
   c. Smart thermostats and water heaters
6. DSM and DER provide flexibility to the system by reducing local energy demand during peak times, thus reducing the investments needed to provide resource adequacy, transmission, and distribution capacity.
7. Additional benefits include better RE integration and reduced pollution, improved resiliency and reliability, and a redistribution of energy payments benefitting consumers and communities.
8. DOE expects that by 2030, demand that can be cost-effectively managed will grow to 22.5% of peak. This cost-effective management is assumed through demand response and time varying rates.
9. DOE finds potential savings in US are 13 billion dollars per year (8.8 generation, 1.3 transmission, 1.4 distribution, 0.9 avoided energy, 0.4 avoided ancillary costs)

ABOUT THE PEAK COALITION MEMBERS

CLEAN ENERGY GROUP (CEG) is a national nonprofit working to provide innovative technical, economic, and policy solutions to enable communities to participate equitably in the clean energy transition and help ensure affordable, reliable clean energy for all. CEG is a leading advocate for energy storage, renewable generation, demand response, and other clean alternatives to replace fossil fuel power plants, working in collaboration with the communities impacted by toxic power plant emissions to raise awareness of disproportionate harms and accelerate community-led transitions. For the past decade, CEG has been facilitating solar and battery storage development in historically marginalized communities, supporting more than 300 solar and storage projects in a hundred communities across the country and advancing equitable state storage and renewable policies and programs. www.cleanegroup.org

NEW YORK LAWYERS FOR THE PUBLIC INTEREST (NYLPI) is a nonprofit civil rights law firm committed to advancing equality and civil rights through community lawyering and partnerships with the private bar. NYLPI has used its legal and policy expertise in tandem with organizing and community partnerships for over two decades to address disproportionate environmental burdens in New York City's low-income communities of color. NYLPI represented UPROSE in a challenge to the development and siting of new peaker plants in the early 2000s, and in 2010 and 2011 worked closely with NYC-EJA to revise New York law to help protect low-income communities and communities of color from being disproportionately burdened by the impacts of new power generating facilities. Since 2016, NYLPI has supported community renewable energy project developments in environmental justice communities and has advocated for equity in state and local energy policy. www.nylpi.org

The **NEW YORK CITY ENVIRONMENTAL JUSTICE ALLIANCE (NYC-EJA)** is a nonprofit citywide network linking grassroots organizations from low-income communities of color in their struggle for environmental justice. NYC-EJA integrates groundbreaking research, robust campaigns, and technical assistance for its members and allies. In this capacity, NYC-EJA is immersed in energy related advocacy and planning, providing support to the local struggles of its members who are advocating for the displacement of polluting infrastructure from their communities while concurrently developing renewable energy opportunities that optimize local health and economic benefits. NYC-EJA is committed to advancing energy resilience and just transitions in the energy sector through leadership in power building efforts at both City and State levels, and engagement in existing initiatives such as New York's Reforming the Energy Vision and New York City's 80x50 and PlaNYC goals. In June 2019, NYC-EJA as a leader in the NY Renews coalition pushed New York State to pass ambitious and historic legislation to drastically cut its greenhouse gas emissions economy-wide by 2050, including a zero emissions target for the electricity sector. www.nyc-eja.org

THE POINT CDC is dedicated to youth development and the cultural and economic revitalization of the Hunts Point Peninsula of the South Bronx. After Superstorm Sandy, THE POINT mobilized elected officials, businesses, labor groups, and local residents to inform the creation of the Hunts Point Lifelines Plan focused on building climate resilience. This input led Lifelines to receive a $20 million Rebuild by Design award from HUD and $25 million from the City towards the development of renewable, resilient energy systems and stormwater management infrastructure in Hunts Point. Additionally, THE POINT is currently in the pre-development stage for what will be one of the largest community solar projects in New York State with support from New York State Energy Research Development Authority (NYSERDA). www.thepoint.org

UPROSE, founded in 1966, is Brooklyn's oldest Latino community-based organization located in Sunset Park. UPROSE is an intergenerational, multi-racial, WOC-led community organization working at the intersection of racial justice and climate change through community organizing, education, indigenous and youth leadership development, and cultural/artistic expression. In the aftermath of Superstorm Sandy, UPROSE has established the Sunset Park Climate Justice Center, focused on engaging community residents and businesses to generate grassroots led climate adaptation and community resiliency planning. For a quarter century, UPROSE has been engaged in advocacy around the siting and deployment of polluting power plants and the development of alter-natives. UPROSE is currently developing New York City's first community owned solar project. UPROSE is a Steering Committee member of New York Renews—a statewide coalition of over 200 organizations that help pass the Climate Leadership and Community Protection Act in 2019, and the national Climate Justice Alliance—a coalition of over 70 urban and rural frontline organizations across the nation building a Just Transition. www.uprose.org

DEMANDING A BETTER GRID

HOW DEMAND MANAGEMENT CAN ACCELERATE THE PHASE-OUT OF NEW YORK CITY'S PEAKER POWER PLANTS

The PEAK Coalition—UPROSE, THE POINT CDC, New York City Environmental Justice Alliance (NYC-EJA), New York Lawyers for the Public Interest (NYLPI), and Clean Energy Group (CEG)—has come together to end the long-standing pollution burden from power plants on the city's most climate-vulnerable people. This Coalition will lead the first comprehensive effort in the US to reduce the negative and racially disproportionate health impacts of a city's peaker plants by replacing them with renewable energy and storage solutions. Our collaboration brings technical, legal, public health, and planning expertise to support organizing and advocacy led by communities harmed by peaker plant emissions. Together with communities, we are advocating for a system of localized renewable energy generation and battery storage to replace peaker plants, reduce greenhouse gas (GHG) emissions, lower energy bills and make the electricity system more resilient in the face of increased storms and climate impacts.

More information about the PEAK Coalition can be found here:
www.peakcoalition.org

Clean Energy Group

NEW YORK CITY ENVIRONMENTAL JUSTICE ALLIANCE N·Y·C E·J·A 19 91

NYLPI
JUSTICE THROUGH COMMUNITY POWER

THE POINT CDC
WHERE COMMUNITY AND CREATIVITY CONNECT

UPROSE

PHOTO: SEBASTIAN BAEZ/UPROSE