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VIRTUAL POWER PLANTS: ASSESSING EQUITY IN EMERGING STATE POLICIES & PROGRAMS

initiative for energy justice

Virtual Power Plants: Assessing Equity in Emerging State Policies & Programs

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As electricity costs and demand rise due to data centers, states and utilities are turning to Virtual Power Plants (VPPs) as a faster, cheaper alternative to building new gas infrastructure to meet growing energy demand. VPPs — networks of solar panels, batteries, smart thermostats, and electric vehicles that are coordinated to act as a single flexible resource — are moving from pilot projects to policy mandates and programs. VPPs use software and real-time data to coordinate millions of distributed devices across a network to respond dynamically to shifting weather conditions, peak demand events, and grid stress in ways that traditional power plants cannot. For utilities and grid operators willing to learn and implement these emerging tools, VPPs offer a path to meeting growing energy needs without the high costs and added pollution of new fossil fuel generation. At the same time, early program design decisions are determining whether VPPs extend clean energy benefits to those who need them most or replicate existing gaps in clean energy access.

A VPP is not a building or physical structure; it is a network. Rather than generating power from a single site, a VPP aggregates distributed energy resources (DERs), defined by federal regulators as small-scale power generation or storage technologies, including home batteries, rooftop solar paired with storage, smart thermostats, electric vehicles, heat pumps, and smart water heaters, across many locations and coordinates them digitally to respond to grid needs in real time. When demand spikes during a heat wave or winter storm, a VPP can dispatch stored energy from thousands of home batteries simultaneously, reduce load through smart thermostat adjustments, or shift EV charging to off-peak hours. Distributed energy resources are the building blocks, and VPPs are the coordination layer that makes them collectively useful to the grid. The following visual demonstrates how a VPP functions as a coordination layer by aggregating, optimizing, and predicting across the power grid to deliver flexible energy capacity to households, commercial, and industrial customers by tapping into DERs.

Distributed Energy Resources (DERs) are defined by federal regulators as small-scale power generation or storage technologies, including home batteries, rooftop solar paired with storage, smart thermostats, electric vehicles, heat pumps, and smart water heaters.

A virtual power plant pulls together DERs like solar, wind, battery storage, and smart thermostats to support the grid as one flexible resource.

VPP deployment continues to accelerate across the United States. In North America, VPP capacity grew from 33 GW to 37.5 GW in the first half of 2025, and a recent report by Smart Electric Power Alliance (SEPA) & NC Clean Energy Technology Center highlights the 35 states that advanced VPP and DER aggregation policies and the actions taken by legislators, regulators, and utilities to roll out VPPs in 2025. This 4.5 GW of capacity growth (enough power to approximately 3 million U.S. households, based on EIA's average household consumption) is due to the expansion of battery storage, EV charging, and smart thermostat deployment for VPPs. The DOE's 2025 Pathways to Commercial Liftoff report found that deploying 80–160 GW of VPPs (enough to serve 10–20% of peak load) could support projected load growth while reducing overall grid costs. The momentum of VPPs continues as additional states adopt programs/policies, and the Clean Energy States Alliance (CESA) currently tracks active battery-based programs in more than 20 states. The policy infrastructure is expanding, but deployment alone does not guarantee equitable access.

What the data reveals about the VPPs is that the equity provisions need to be improved for program design and delivery. Of the 48 programs in the tracker (CESA), 13 programs (less than 1/3) include explicit equity provisions like income-qualified adders, low-income carve-outs, or priority enrollment for disadvantaged communities. That gap matters because the communities with the most to gain from VPPs are often those who have been most excluded from clean energy. Low-income households carry disproportionately high energy burdens. Renters, who make up approximately 35% of U.S. households, face high barriers to entry to access traditional rooftop solar programs. Communities of color bear the legacy of redlining in the form of aging housing stock, higher utility costs, and longer outage recovery times. Rural communities face a combined home and transportation energy burden nearly 50% higher than urban households, which is compounded by aging infrastructure and frequent outages. VPPs don't automatically reach these populations, but when programs are intentionally designed, the potential is significant.

The following five state profiles examine a range of approaches and emerging policies with equity considerations and gaps remaining for VPPs.

FIVE STATE SNAPSHOTS

Louisiana (New Orleans) — Community Power

At a Glance

Program/Policy	**Neighborhood Power Plan** • $30M over three years - 100% from Entergy settlement, zero ratepayer cost • Solar + battery storage installations for 1,500 homes and 250 community institutions
Status	24 Community Lighthouse sites financed and installed, February 2026
Policy/Regulatory Action	New Orleans City Council - unanimous vote, December 2025
Equity	• $28M in upfront incentives for installing solar + battery systems • 40% of residential incentives are reserved for low-to-moderate income (LMI) households • Performance payments for households and institutions that dispatch power to support the grid
Community Design	• Community-organized and community-designed – advocacy and proposal • Goal: every resident within a 15-minute walk of a resilience hub aka community lighthouse
Priority Population(s)	• Communities of color and LMI households hit hardest by Hurricane Ida

In 2021, Hurricane Ida's aftermath exposed a familiar pattern across the Gulf South: New Orleans' lowest-income neighborhoods and communities of color endured the longest and deadliest outages. When Entergy proposed new gas infrastructure for rebuilding efforts, community groups organized to challenge the continued fossil fuel investment that pollutes their neighborhoods. In response, Together New Orleans and the Alliance for Affordable Energy built the Community Lighthouse Project to prioritize solar and battery installations at churches and community centers and drafted the Neighborhood Power Plan as the centerpiece of a broader people's energy transition.

Entergy opposed it, but the community prevailed. In December 2025, the New Orleans City Council voted unanimously to approve the $30 million program, funded entirely from Entergy settlement dollars with zero cost to ratepayers. The Neighborhood Power Plan is the largest per-capita city VPP program in the U.S. and is designed and shaped by community advocacy.

The Community Lighthouse Project is a network of resilience hubs (solar and battery installations at churches, community centers, and trusted neighborhood facilities) designed to keep critical spaces powered during outages and serve as gathering points when the surrounding grid goes down. The design goal — a resilience hub (aka community lighthouse) within a 15-minute walk for every resident — reflects the program's focus on building resilience for the most vulnerable first and providing grid services second. Installations of solar-paired battery systems at 1,500 homes and 150–250 community institutions are rolling out across the city in 2026. As of February 2026, 24 Community Lighthouse sites had been financed and installed, and participants receive incentives and performance payments when their batteries dispatch power to support the grid during emergencies. The New Orleans model is notable both for its scale and for being designed and driven by the community it serves.

Illinois — Affordability as a Mandate

At a Glance

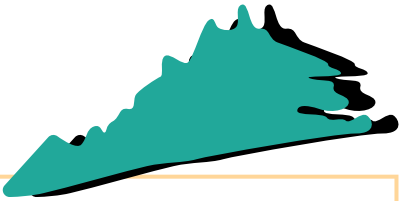
Program/Policy	Clean and Reliable Grid Affordability Act (CRGA / SB 25) • Projected savings $13.4B over 20 years • 3 GW energy storage by 2030
Status	Program under development
Policy/Regulatory Action	Legislation signed by Gov. Pritzker, Jan 2026 (effective June 2026)
Eligible DERs	Smart thermostats, solar panels, small batteries, and electric vehicles
Equity	• 80% of income-qualified budgets to whole-home weatherization • Requires utilities to meet 25% minimum spending target on energy efficiency programs for LMI households
Community Design	Equity provisions codified in statute
Priority Population(s)	• LMI households

In 2025, electricity bills sharply increased in Illinois due to surging capacity market prices. In response, Governor Pritzker signed the Clean and Reliable Grid Affordability Act (CRGA), which requires ComEd and Ameren to develop programs to incentivize households and businesses to deploy solar, batteries, smart thermostats, and EVs in support of the grid during peak hours. The CRGA provisions have equity built directly into the statute; therefore, equity considerations are not left to utility decision-making. The provisions require electric utilities to spend a minimum of 25% of their total efficiency program budgets on income-qualified households. The law codifies that 80 percent of income-qualified program budgets for gas utilities must go toward comprehensive, no-cost whole-home weatherization, ensuring that low-income households don't just receive a device, but a meaningfully more efficient and comfortable home.

The CRGA also sets a 3 GW grid-scale battery storage procurement target by 2030, with the Illinois Power Agency projecting $13.4 billion in savings over 20 years. It also establishes a new Storage for All program to extend battery storage benefits to income-eligible households, nonprofits, and public facilities. CRGA takes effect June 2026, with utilities required to file Scheduled Dispatch VPP program proposals by then to launch programs. For low-income households, Illinois represents a policy model with equity embedded in design, although implementation will determine how fully the benefits are realized by households.

Virginia — Bipartisan Mandate

At a Glance



Program/Policy	Community Energy Act (HB 2346 / SB 1100) • 600 MW (450 MW Dominion + 150 MW APCo)
Status	VPP proposal filed December 2025, program under development
Policy/Regulatory Action	Legislation signed by Gov. Youngkin, May 2025 Gov. Spanberger (took office in January 2026) signed additional bills addressing affordability and demand flexibility (HB284/SB371, HB2/SB72, HB3/SB5), April 2026
Eligible DERs	Solar and battery storage, smart thermostats, water heaters, heat pumps, and electric vehicles
Equity	• LMI upfront incentives referenced in the legislation but details TBD
Community Design	• Community and advocate coalition supported passage • State Corporation Commission (SCC) filing process ongoing
Priority Population(s)	• LMI households

Virginia's Community Energy Act, signed by Governor Youngkin, mandates the largest utility-required VPP pilot in the country at the time of passage. The policy's primary driver is grid constraint, as PJM capacity prices in Dominion's service area surged from roughly $29/MW-day in 2024–25 to nearly $270/MW-day in 2025–26. This price surge (~10x) is driven significantly by AI and data center electricity demand in northern Virginia. Dominion filed its VPP proposal with the State Corporation Commission (SCC) in December 2025, and the program is under development.

The equity provisions in the Community Energy Act are less explicitly defined than in Illinois, but the SCC review and approval process represents a key opportunity for advocacy. The political context has also shifted under Governor Spanberger, who took office in January 2026 and ran on an affordability campaign. Since then, she has signed several affordability initiatives, including legislation to reduce heating and energy costs for low-income Virginians and establish a statewide weatherization task force. The Governor also signed legislation directing Dominion Energy and Appalachian Power to create demand flexibility programs, with the goal of avoiding costly new infrastructure by better managing existing grid capacity. Virginia represents an early example of how grid reliability concerns can open the door to broader clean energy policy with the expansion of policies being favored by Governor Spanberger for energy efficiency, solar, DERs, and affordability.

New Jersey — Community Solar Integration and Renter Access

At a Glance

Program/Policy	Triennium 2 (T2) + Garden State Energy Storage Program (GSESP) + Executive Order 2 • $3.75B energy efficiency & demand response budget • 2,000 MW energy storage target by 2030 • Additional 3,000 MW community solar
Status	Program under development
Policy/Regulatory Action	NJBPU approved T2, Oct 2024; Gov. Sherrill signed Executive Order 2 to develop VPPs, Jan 2026; GSESP Tier 1 awards, March 2026
Eligible DERs	To be determined
Equity	• 30% low-income benefits adder • No-cost efficiency upgrades for income-qualified customers • 25% bill credit discount for LMI households • 51% of community solar capacity reserved for LMI subscribers
Community Design	To be determined
Priority Population(s)	To be determined

In New Jersey, the New Jersey Board of Public Utilities (NJBPU) Triennium 2 framework allocates $3.75 billion across seven utilities through mid-2027, with smart thermostat and building controls programs explicitly designed as the foundation for VPP development, not as standalone efficiency measures. When Governor Sherrill took office in January 2026, she signed Executive Order 2 directing NJBPU to accelerate VPP development alongside solar and storage expansion. In February 2026, NJBPU issued a request for information to electric utilities, asking them to identify grid hosting constraints and how new DER interconnections can be accelerated as a first step to setting up utility VPP programs.

What makes New Jersey distinct is the equity provisions across the energy efficiency and battery storage programs. A 30 percent low-income benefits adder applies across programs. The community solar program's 3,000 MW expansion (approved in March 2026) reserves 51% of capacity for LMI subscribers with a guaranteed minimum 25% bill credit discount. Income-qualified customers receive no-cost home energy upgrades through T2. The community solar-to-VPP integration is one of the few policy designs that creates a pathway for renters to participate in clean energy programs without requiring roof ownership. New Jersey's equity groundwork is already in place across T2, GSESP, and community solar. Whether that access carries through into formal VPP program design will depend on how utilities respond to the NJBPU's 2026 RFI and the equity requirements that are embedded.

Colorado — Legislative Mandate, Utility Execution

At a Glance

Program/Policy	**Aggregator VPP Program (AVPP) under SB 24-218** • 125 MW target by 2031 ◦ Growing 25 MW/year starting 2026 • $78.5M five-year budget
Status	VPP approved by PUC 2025, Aggregator enrollment underway 2026
Eligible DERs	Batteries, smart thermostats, water heaters, heat pumps, EV chargers
Policy/Regulatory Action	Legislation signed by Gov. Polis, May 2024 → PUC approved Xcel VPP application, Jan 2025
Equity	• No explicit provisions – SB24-218 requires Xcel to map DER hosting capacity for DACs in distribution system planning
Community Design	• No explicit provisions
Priority Population(s)	• No explicit provisions

Colorado's SB 24-218, signed by Governor Polis in May 2024, required Xcel Energy to file a VPP application with the Colorado Public Utilities Commission (PUC) by February 2025 with a performance-based compensation tariff. After that, Xcel filed its Aggregator VPP Program (AVPP) in January 2025, the proceeding was consolidated with Xcel's Distribution System Plan, and the PUC approved a widely supported settlement in 2025. The AVPP is structured as an open-access, third-party aggregator model so that any qualifying aggregator can enroll customer DERs and receive performance-based payments. The program is expected to grow 25 MW per year toward a 125 MW target by 2031, with the program launch in 2026. Prior to the AVPP, Xcel Energy has operated the Renewable Battery Connect program in Colorado since 2023. That program dispatches customer-owned batteries directly and has enrolled nearly 2,000 batteries and 15 MW of managed capacity as of January 2026. The growth of VPPs continues in Colorado with the AVPP.

The AVPP does not have any explicit equity provisions, however, SB 24-218 does require Xcel to map DER hosting capacity for disproportionately impacted communities in its distribution system planning and to engage those communities in that process. The AVPP tariff also includes a $65/kW adder for DERs on constrained feeders. Constrained feeders are sections of the local distribution grid that are operating near capacity and most commonly located in older, lower-income neighborhoods where the grid infrastructure hasn't been upgraded or lacks investments. Notably, the Renewable Battery Connect Program does include explicit equity provisions in which income-qualified and disproportionately impacted community customers receive $800/kW toward battery equipment costs. For the AVPP in Colorado, there is a pathway to build an equitable program by integrating intentional outreach and design to reach the most impacted and vulnerable households, as demonstrated in other existing battery programs.

MOVING FORWARD

These five states are a snapshot of states progressing VPP policies and programs, but the momentum is national. The Clean Energy States Alliance's 2026 database reflects a growing number of utilities and regulators formalizing programs that were in pilot or pre-application stages just two years ago. The central design questions of who gets access, how performance payments are structured, and whether aggregators can serve low-income customers at scale will determine whether VPPs deliver broadly shared benefits or concentrate gains among early adopters. The New Orleans and Illinois models offer strategies for integrating equity into program design. The snapshots also reveal where equity can still be considered in delivery and implementation through regulatory processes, program design, and community advocacy for states like Virginia, New Jersey, Colorado, and other states adopting VPPs. For communities that bear the highest energy costs and experience the greatest grid vulnerability, VPPs represent real potential. Unlike traditional grid infrastructure, VPPs can be deployed faster, at lower cost, and directly inside the neighborhoods that need them most by turning household devices into community assets that generate income, reduce bills, and keep the lights on when the grid fails. Whether the potential of VPPs is realized depends on who is at the table when programs and policies are designed and whether equity is integrated or an afterthought.