

Dominion Energy Virginia: Flexibility at the Grid Edge

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This case is a hypothetical strategy exercise based on public information. It does not describe an actual internal assignment or reveal a later filing, regulatory decision, or customer outcome.

The decision

In fall 2026, Virginia Electric and Power Company (Virginia Power), Dominion Energy's regulated Virginia utility, is preparing a voluntary Large Load Demand Flexibility (LLDF) program petition due to the Virginia State Corporation Commission (SCC) by January 15, 2027. The team developing the petition must decide how to convert a new state law and an early stakeholder process into an implementable program.

The law gives the utility room to propose a design, while directing the SCC to set the appropriate standard and measurement rules. Dominion has published preliminary program tenets, but has not filed a final proposal. Stakeholders disagree about how to compensate readiness and delivered reductions, how to measure performance, and whether local congestion and system-wide needs should use one program or separate tracks.

You are advising a hypothetical Virginia Power planning team. What should it put in its petition? Your design must state who can participate, what service they provide, where and when the utility can call on it, how performance is measured, who pays, and how the utility protects reliability and other customers.

A new statutory program

Virginia's 2026 law, effective July 1, requires each Phase I/II utility to petition for approval of a voluntary program by January 15, 2027. The SCC must issue a final order by November 30, 2027. A qualifying retail customer has contracted or measured demand of at least 25 MW and anticipated or measured average annual load factor of at least 75%, subject to a statutory exclusion for specified contracted defense facilities. This definition is not synonymous with data centers: some data centers may not qualify, and other customer types may.

The petition must analyze several ways customers could contribute, including geographic or spatial shifting, dynamic voltage or frequency scaling, storage, and participation without directly reducing their own use—for example, by securing verified reductions from other retail customers through capacity-reduction credits (CRCs). The SCC sets the demand-flexibility standard and measurement and verification (M&V) requirements. CRCs must be measured and verified standard units approved by the Commission.

The statute directs the program to reasonably maximize electric-system savings and improve reliability. It requires attention to peak periods where practicable, localized solutions, emissions and public-health impacts, and incentives that do not unreasonably shift program costs to other retail customers. Carbon-emitting generation resources may not participate. Accelerated interconnection may be considered only if reliability is not sacrificed. The law establishes the petition and regulatory process; it does not determine the eventual program design or the level of customer response.

The utility and its operating context

Dominion Energy, Inc. is the listed parent company. Virginia Power is its wholly owned electric utility subsidiary and the entity responsible for this Virginia program. “Dominion Energy Virginia” refers to the utility’s primary regulated electric operating segment/business, not a separate listed parent. Company filings report separate parent and utility statements. Do not treat parent-level results or proposed corporate transaction benefits as program resources.

Dominion’s September 2026 “Operational Realities” presentation describes local N-1 operating constraints, post-contingency local load relief warnings (PCLLRWs), and electrical proximity measures such as distribution factors (DFAX). The company argues that a customer’s usefulness for relieving a constraint depends on its electrical location, not simply its distance on a map. It distinguishes Dominion Zone transmission territory from the utility’s load-serving territory. The presentation is the utility’s operating account, not an independent review or a public map of eligible locations.

The presentation also cites more than 20 GW of new data-center capacity expected to connect by 2031, about 45 GW in a later batch, and roughly ten large-load requests a month. These are company forecasts and requests, not connected or consumed load, firm commitments, or available flexibility. Virginia Power’s 2025 resource plan separately reports a 2025 snapshot of connected campuses, firm-contract stages, and projects being studied. The measures differ by date and status; they should not be added together or treated as realized demand.

Dominion’s 2025 Form 10-K describes an approximately \$55 billion Virginia Power capital plan for 2026-2030, net of Stonepeak reimbursements. It covers generation, transmission, distribution, substations, and maintenance. It is a plan, not completed spending or a list of investments that flexibility could avoid. The utility’s 2025 resource plan also says data centers had been hesitant to join then-existing demand-response or interruptible programs and that the company had seen no response to then-current high-price signals. That is an earlier company observation about existing offers, not proof of how customers would respond to a new design.

Existing pilot, imperfect evidence

Virginia Power’s CAPFLEX pilot offers existing large loads in a constrained Loudoun County pocket additional capacity on a non-firm basis beyond their allocated firm load. The utility can call for curtailment when local conditions become constrained, including during a PCLLRW. Dominion says existing facilities were not designed for flexibility and that actual events may last longer than customers expect.

The utility’s presentation lists 2026 year-to-date curtailment of **507.82 hours, 29 events**, and an **18.14-hour average event duration**; it lists the longest event as 194.48 hours, from May 24 through June 1. The first three measures do not reconcile: 507.82 divided by 29 is about 17.51 hours per event, while 507.82 divided by 18.14 implies 28 events. The presentation does not specify the 2026 observation end date. It provides no site count, customer impact, baseline, cost, or independent evaluation. Preserve the three figures as separately reported; the source

does not tell you which, if any, should be corrected.

CAPFLEX is an existing conditional service arrangement, not the new voluntary program. It raises design questions about locational value and event duration, but does not establish how many customers will enroll, the response available elsewhere, a reliable baseline, or the economics of a new program.

Stakeholders begin to shape the design

Dominion says its stakeholder process began with a July 29 kickoff and a September 10 working group meeting. A second meeting was scheduled for October 14, after this case's cutoff. In a September 18 deck, the company summarized a survey of 38 organizations: 13 large-load customers, 12 technology or infrastructure providers, 11 aggregators or flexibility providers, and two public-interest organizations.

The survey reports broad support for verified flexibility, locational relevance, and telemetry where available, but disagreement on key design questions: pay for availability, delivered performance, or both; use common or technology-specific M&V; create separate local and system programs or a single program with location-based credits; and how to set penalties and treatment of third-party resources. The deck cautions that response counts do not necessarily represent preference. The survey was self-selected; it is not a representative poll, an enrollment commitment, or an SCC finding.

Dominion's own preliminary tenets include dispatchable flexible capacity, defined event triggers, at least one locational program, current location signals, customer responsibility for flexibility and program costs, relevant aggregator participation, standardized program rules, separate treatment of local congestion and system adequacy, and telemetry M&V where a dispatchable technology has telemetry. These are Dominion's proposals for further design work—not the statute, a filed tariff, or a Commission-approved program.

What research can and cannot tell the team

Academic studies offer mechanisms to investigate, not a ready-made estimate of Virginia customer response.

- **Workload shifting:** Liu and coauthors model data-center scheduling using workload traces and utility peak-warning information. In one modeled configuration with local solar and diesel generation, they report up to 40% cost savings against two scheduling heuristics. This is not measured customer delivery, a general savings estimate, or dependable capacity. Results depend on workload, assumptions, warning accuracy, generation configuration, and the chosen comparator. The statutory program also excludes carbon-emitting generation resources.
- **Industrial price response:** A study of 20 large Houston industrial customers found limited but heterogeneous response to wholesale prices. The authors suggest other interruptibility commitments may constrain response. This is observational evidence from a different market and period, not an estimate for Virginia data centers.
- **Measurement:** A study of one Spanish university building shows that baseline adjustments and post-event recovery can materially affect measured demand response, with results that differ across examples. It does not validate a method for large loads or data centers.

- **Local versus system value:** A Dutch residential electric-vehicle feeder simulation shows that a price signal can shift energy without necessarily relieving a local peak; local congestion and system balancing can conflict. It is a model, not field evidence about a Virginia utility node.

One additional data-center study is available only as an abstract in the reviewed research package. Its reported result is provisional and should not drive the program design. Across the literature, no reviewed study measures Virginia Power customers' committed flexibility, verifies a large-load baseline, or establishes program costs or avoided infrastructure investment.

The choice

The petition team has several credible paths. It may combine elements, but it must explain how the pieces work together.

1. **Common framework with differentiated credits.** Apply standardized eligibility and verification, then distinguish local and system value through separate credits or location adders. This could simplify enrollment and program administration. It also risks using coarse signals to value resources with different operating limits or grid value.
2. **Separate system and local tracks.** Use distinct triggers, eligible locations, measurement rules, and payments for system peaks and constrained nodes. This could tie compensation more directly to the service needed. It would require transparent locational data, careful dispatch coordination, and more complex administration and M&V.
3. **Staged portfolio of participation routes.** Begin with demonstrations or limited enrollment across customer curtailment, workload shifting, storage, and qualifying third-party CRCs, then expand as measured performance and costs become clearer. This could build evidence before broad commitments. It may delay potential benefits, and each resource route introduces different attribution, reliability, cost, and verification questions.

Across these options, the team must decide whether to pay for availability, delivered reduction, or a defined combination; how to measure a counterfactual and recovery; how much notice and how many events to permit; who bears costs and nonperformance risk; and what evidence is required before a resource receives credit. A megawatt of nameplate capacity is not necessarily a megawatt of dependable, locationally useful reduction. Flexibility may complement grid investment, but the available evidence does not establish one-for-one substitution.

Assignment

Prepare a recommendation to the hypothetical Virginia Power petition team as of October 4, 2026. Specify:

- the participation routes and qualifying service;
- system and local event triggers, notice, duration, and frequency;
- eligibility and locational signals;
- availability and/or delivery compensation, testing, nonperformance, and recovery treatment;
- M&V and cost allocation, including protection of nonparticipating customers;
- reliability and emissions safeguards; and
- a short list of data or pilot gates that would change or expand the design.

State assumptions clearly. Separate statute, Dominion proposals, stakeholder opinions, company forecasts, pilot reports, and academic mechanisms. Identify what the team cannot know from the evidence. Do not assume that a proposed program has been filed or approved, or that customers have committed to participate.

Selected public sources

- [Virginia HB 284, 2026 Acts ch. 377 and Va. Code §56-596.7](#)
- [Dominion Large Load Demand Flexibility page](#)
- [Dominion stakeholder survey-results deck](#)
- [Dominion “Operational Realities” presentation](#)
- Integrated research literature review and evidence extraction (instructor/research material; distribute selectively)