

Large Load Demand Flexibility: What We Have Heard From Stakeholders

Key findings from the Large Load Demand Flexibility Working Group stakeholder survey responses

9/18/26

***Note:** this deck covers materials presented to stakeholders at session 1 of the Large Load Demand Flexibility Stakeholder Working Group. The materials have been updated to improve clarity for those who did not attend the working group*

Stakeholder Survey Context

Context behind the working group stakeholder survey, and what this deck covers



Context

- As per SB 371 / HB 284, Dominion Energy Virginia must file a **voluntary demand flexibility program(s) for large load customers** by January 15th, 2027.
- To inform the process, Dominion Energy Virginia stood up a **Large Load Demand Flexibility (LLDF) Stakeholder Working Group**.
- As part of the working group, Dominion solicited feedback on various parts of program design via a stakeholder survey.
- This deck **summarizes the findings** from stakeholder responses to the survey.

This deck:

- 1 Breaks down survey question topics and which stakeholders responded
- 2 Presents survey results on various elements of LLDF program design, such as incentives, penalties, capacity reduction credits (CRCs), locational value, and measurement and verification (M&V) approaches
- 3 Explores responses from large load customers, who are the target customer for the LLDF program(s) being developed
- 4 Outlines Dominion's proposed fundamental LLDF program tenets, combining areas of survey consensus with Dominion's operational realities

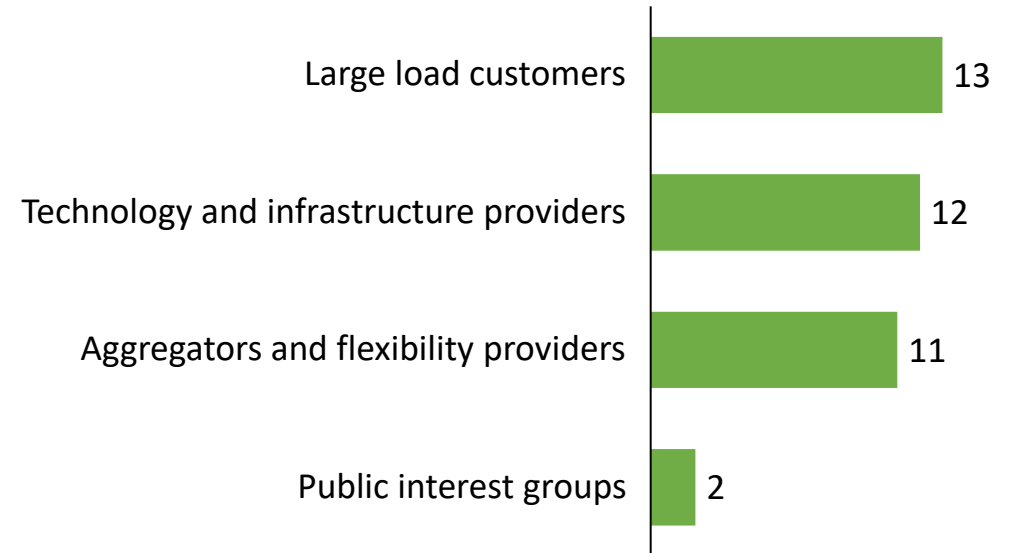
Survey Coverage and Respondents

Our survey asked stakeholders for their views on program design. 38 organizations responded

The survey solicited views on different elements of program design

- **Program structure:** How should the program LLDF (s) be structured?
- **Capacity Reduction Credits (CRC):** What should a CRC represent? How should it be valued? How can locational value be reflected?
- **Participation incentives:** What incentives would encourage participation? How do they differ for resolving capacity adequacy shortfalls vs locational constraints?
- **Non-participation penalties:** How should non-performance be addressed?
- **Measurement & verification (M&V):** How should a unit of demand flexibility be measured and verified for various technologies listed in SB 371 / HB 284?
- **Customer protections:** How should non-participating customers be protected from costs associated with the program(s)

We received 38 responses from a variety of stakeholders



Survey Results Summary

Diverse engagement yielded areas of broad alignment and areas to iron out

Areas of broad stakeholder consensus¹

 **CRC:** Should represent verified demand flexibility *capability*, not nameplate capacity

 **Most desired incentives:**

1. Accelerated interconnection
2. Reduced tariff costs/obligations
3. PJM IRAS² shielding/offset

 **Eligibility:** Should be technology-agnostic...
...Except for non-dispatchable forms and GETS³

 **M&V:** Telemetry wherever possible
Robust baseline comparison where not

 **Locational value:** For local congestion, flexibility must be electrically proximate to be effective

Areas of stakeholder misalignment

 **CRC:** Could value availability of flexible capacity, delivered performance, or both
Dominion view: Open to both, program dependent

 **Penalties:** Range of views on level of severity
Dominion view: Program dependent

 **System vs Locational:** Separate programs, or locational adder applied to base system credit
Dominion view: Separate programs

¹ Majority views among stakeholders, though not necessarily universal or the current position of the Company; ² Interim Resource Adequacy Service; ³ Grid Enhancing Technologies

Views on Incentives and Penalties

Incentives: In the round, plus focus on system peak vs local congestion relief

Penalties: Types of penalty, penalty severity, areas of alignment and misalignment

What incentives did stakeholders want to see?

Accelerated interconnection is number 1 incentive, though increased demand charges and IRAS requirement offsets featured heavily

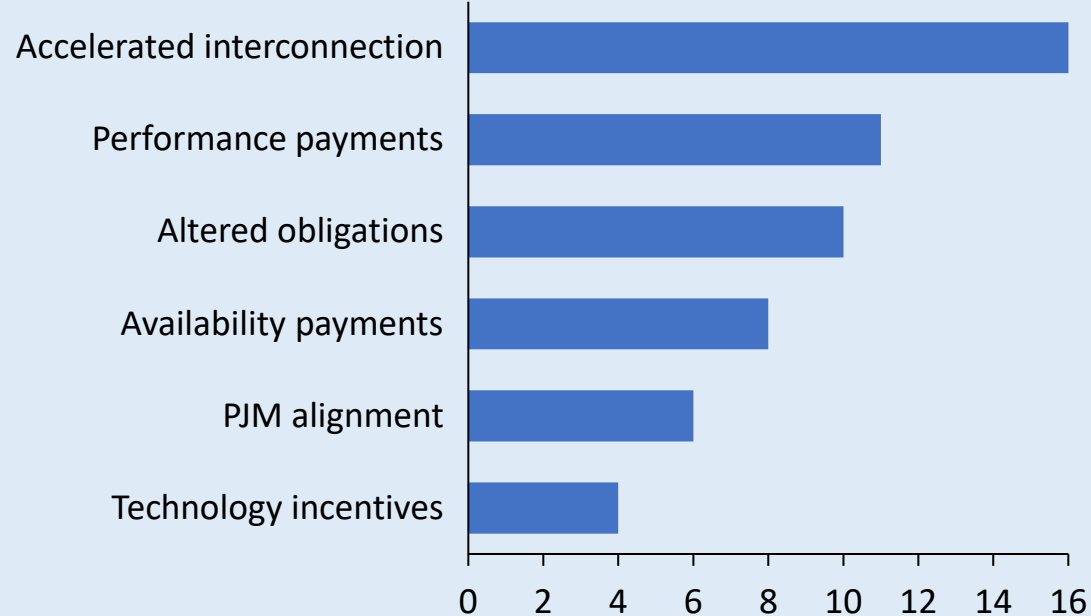
- Mentioned more frequently*
- 
- 1 Accelerated Interconnection:** Consistently identified as the most compelling participation incentive over traditional payment structures.
 - 2 Customer Costs & Obligation Relief:** Stakeholders recommended altering cost allocations, customer obligations and demand charges in return for performance.
 - 3 PJM IRAS Shielding:** Many stakeholders flagged the value of large loads being shielded from IRAS curtailment obligations by enabling flexible capacity enrolled in this program to count as BYONC
 - 4 Flexibility Compensation:** Stakeholders supported compensating customers for flexibility through readiness payments or compensation tied to delivered performance. However, many large load customers did not value this as highly

Incentives for system peak vs local congestion relief

Local incentives often framed as layering on top of system peak incentives

System Peak

Incentive type by mention

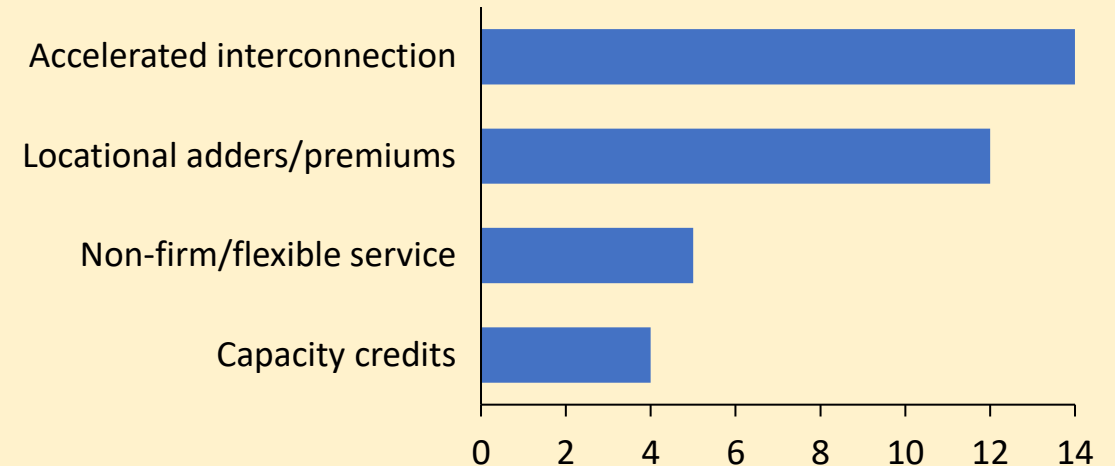


- Essentially the same list as for overall incentives



Local Congestion Relief

Incentive type by mention



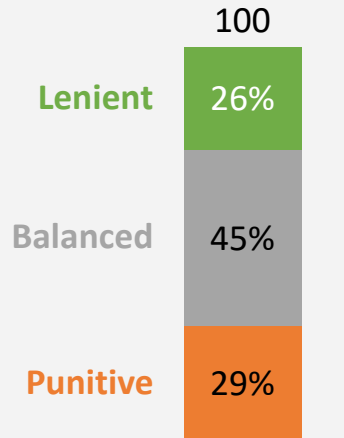
- **Locational premiums** featured prominently
- Many called for **some type of accelerated interconnection** enabled by local congestion relief
- Compensation tied to **avoided/deferred transmission and distribution upgrades**, or unlocked headroom

How should non-performance be addressed?

Stakeholders on average favor balanced, performance-based accountability

Sentiment is balanced

Proportion of Responses re Non-Performance Enforcement



- **Lenient:** limited penalties. Emphasize corrective action
- **Balanced / Neutral:** proportional, performance-based consequences that escalate over time;
- **Punitive:** severe penalties

Various penalties proposed

Severity	Consequence Type
High	Program Suspension / Removal
	Loss of benefits / Capacity Allocation
Medium	Financial penalty
	CRC Reduction / Forfeiture
	Reduced future accreditation
Low	Reduced / Forfeited Payment
	Contractual Resolution
	Corrective Action / Cure Period

1-4 mentions

5-8 mentions

9-12 mentions

High-level alignment, nuanced delivery views



Areas of Alignment

- Performance shortfalls should have consequences which should be **proportional to shortfall impact(s)**
- **Persistent non-performance** warrants **stronger action**
- Program design should preserve participation incentives



Areas of Misalignment

- **Severity of penalties** (see table)
- **Who bears performance risk** (customer vs. aggregator)
- **Timing of enforcement** (immediate penalties vs. corrective action)
- Whether enforcement should vary by **resource type**

Views on Capacity Reduction Credits (CRCs)

- 1) What a CRC should represent
- 2) How CRC should be valued
- 3) How locational value can be reflected by CRCs?

What should a CRC represent?

Three core ideas. One key area of misalignment

1

CRC is verified demand flexibility *capability*

- **Verified, accredited** flexibility
- Dependable, dispatchable capacity
- Not simply installed equipment or nameplate capacity
- Emphasis on M&V, reliability, dispatchability

2

CRC values avoided infrastructure needs

- MW/kW reductions should deliver avoided infrastructure needs e.g.,
 - Generating capacity
 - Transmission/ distribution upgrades
- The latter links closely to locational value

3

Separate system and local value streams

Reflects that value of flexibility differs when resolving system peaks vs local congestion

- Via separate CRCs for local congestion vs system peak, OR
- Via locational adder/multiplier applied to a base system peak reduction CRC

Misalignment: Available capacity vs delivered reduction



CRC should represent an accredited amount of dependable capacity

- Flexible capacity should be rewarded for being *available*
- This can be tailored by how reliable the flexible resource is deemed to be at providing flexibility when called for



CRC should represent demonstrated, delivered load reduction

- Flexible capacity should be rewarded for *performing* when required
- The CRC would be credited post-event, once flexibility is measured and verified

More advocates



What rating factors should feed into CRC valuation?

Resource factors and event parameters featured prominently

Type	Value Factor	Higher CRC value when	Mentions
Resource factors	 Resource reliability (e.g., by technology type)	More reliable	
	 Resource availability for events (e.g., by technology type)	More readily available	
	 Verification confidence (e.g., granularity, availability of telemetry)	More confidence in M&V	
	 Dispatchability/ response time	Quicker response	
Event parameters	 Duration of demand reduction	Longer events	
	 Timing, coincidence with need, operational event triggers	Depends on trigger	
	 Magnitude of verified demand reduction required/delivered	More MW	
	 Event frequency/ annual hours	More frequent events	
	 Notice provided pre-event	Shorter notice	
Impact metrics	 Avoided/ deferred transmission/ distribution upgrades (for local congestion)	More upgrades avoided/ deferred	
	 Electrical proximity of resource to constraint (for local congestion)	More proximal	
	 Avoided/ deferred new generation (for system peak)	More generation avoided/ deferred	
	 Additional headroom unlocked by demand reduction	More headroom unlocked	

Darker shading = mentioned more frequently

How is locational value captured within CRCs?

Locational adder/multiplier/scaler was the most common idea

Two core ideas for capturing locational value

- 1 **Locational adder or scaler** above a **base CRC** for system-wide peak load reduction
- 2 **Separate CRC structures for system peak vs local congestion**, reflecting different use cases and event triggers

Dominion is leaning towards this, given how different system vs locational triggers are

Either way, derive locational value from severity of congestion in affected load pocket and/or scale of deferred or avoided T&D upgrades

Mechanics of Locational Value



Eligibility (*broad alignment*):

- Only electrically proximate/effective resources rewarded
- Per-feeder and per-bank caps to prevent over-concentration



Pricing/Valuation Approach (*conflicting options¹*):

1. Use congestion pricing component of LMP
2. Cap by value of deferred grid investment
3. Determine via power flow studies per constraint
4. Single \$/MW value across whole Dom LSE



Transparent and Evolving Values (*broad alignment*):

- Publish data showing congested areas. Update regularly to provide visibility into evolving needs
- Locational values should evolve as conditions change: E.g., decrease as a pocket becomes less constrained.
 - However, to **provide a stable investment signal**, values could be **locked in for an individual large load customer** at program enrollment for a fixed term

¹ Ideas are not mutually exclusive

Views on Measurement & Verification

How should a unit of demand flexibility be measured and verified relative to (i) system-level benefits, and (ii) local transmission relief for the following technologies:

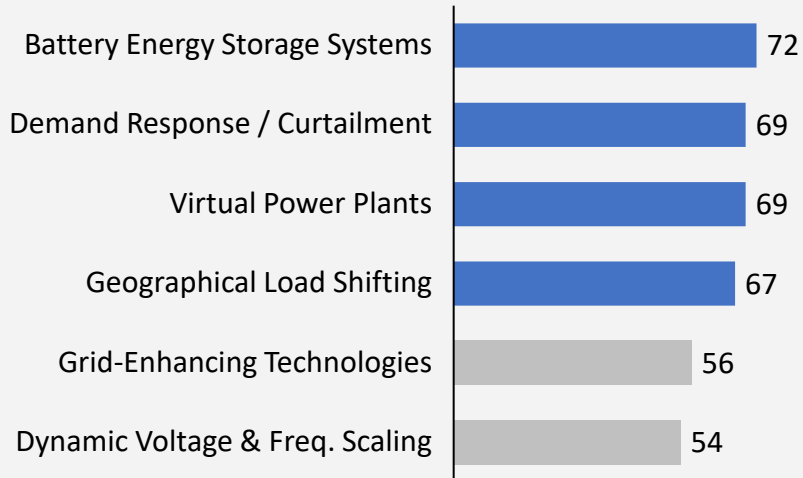
(1) Geographical Load Shifting, (2) Dynamic Voltage & Frequency Scaling, (3) Battery Energy Storage Systems, (4) Demand Response / Curtailment, (5) Virtual Power Plants, (6) Grid-Enhancing Technologies

What could M&V look like for the program(s)

M&V should reflect delivered performance and grid impact

Focus on explicit flexibility technologies

% of stakeholders who responded to the M&V question devoted to each technology



- **Higher participation:** More directly relevant to stakeholder-controlled demand flexibility
- **Lower participation:** More utility-led and specialized
- Caveat: Response **participation** ≠ **preference**. Response rate is best read as an indicator of relevance and familiarity to stakeholders

Telemetry favored wherever available to provide robust M&V

Technology	Most advocated M&V approaches by technology				
	Meter Data	Telemetry	Baseline Comparison	Portfolio Aggregation	Engineering/ Modeling
Battery Energy Storage	✓	✓			
Demand Response/ Curtailment	✓		✓		
Virtual Power Plants		✓		✓	
Geographical Load Shifting	✓		✓		
Dynamic Voltage & Frequency Scaling		✓	✓		
Grid-Enhancing Technologies					✓

There were several areas of misalignment on M&V

Stakeholder differences center on how these principles should be operationalized



Common standard vs tech-specific M&V

Technology-neutral verified MW of flexibility at the point of large load interconnection

Vs

Technology-specific M&V pathways, accounting for nuances per technology



Layered or separate M&V for locational vs system

Layer locational M&V elements on top of base system-wide approach

Vs

Separate approach for locational flexibility, noting that resources must be electrically proximate to provide value



Approach to demand response verification

Use a counterfactual baseline to assess whether resources have reduced their demand

Vs

Assessing against a firm-service level



VPP verification depth

Measure and verify each asset within the VPP portfolio

Vs

Measure and verify on a portfolio basis, using standardized sampling and metering approaches



Whether LLDF program(s) should include GETs

GETs are a separate transmission capability managed by Dominion, so should not be part of the program

Vs

Large loads should be allowed to fund GETs if it creates headroom for them

Focus: Large Load Customer Responses

Large load customers are the target customer for the voluntary LLDF program(s) that Dominion is developing. Their responses warrant particular focus

What We Heard From large load customers [1/2]

There was broad¹ alignment across several principles and ideas



System Peak vs Local Constraints

Separate CRCs for rewarding system peak vs local constraint flexibility

Link locational CRC value/rewards to constraint severity

Be transparent about locational needs through cyclically updated data



Program Eligibility

Programs should be **technology neutral**: curtailment, on-site, off-site resources all valid

But non-dispatchable less appropriate for this program

Annual tests should test ability to respond as well as events themselves



Curtailment Feasibility

Non-firm capacity MW potential is **site-specific and limited**

Ability to curtail is different for **campus** and **co-located** data center operators

Utilizing **third-party flexible resources** to avoid curtailment should be valid option



Program Parameters

Important to, wherever possible, **pre-define factors** like:

- Event frequency
- Event length
- Event notice
- Event qualifier(s)



Valuing Flexibility Provided

CRCs should value **availability** of flexible capacity as well as **delivery** – provides predictable income

Value lower system/infrastructure costs provided by local flexibility e.g., deferred upgrades, unlocked headroom

¹ Though not unanimous

What We Heard From large load customers [2/2]

Core incentive is accelerated interconnections. Views on penalties differed

Participation Incentives¹

-  **Accelerated interconnection** in return for being curtailable and/or providing on/off-site flexibility
-  **Reduced demand charges** in return for (a portion of load) being non-firm
-  **Offset PJM IRAS requirements** to BYONC to prevent being first in line for curtailment during system peak events, in return for bringing flexible capacity for this program
-  **Financial rewards** for making flexible capacity available and delivering flexibility when needed (through CRCs)
-  **Increased capacity access** in return for freeing up headroom by bringing on/off-site flexible capacity

Penalties for Non-Participation

-  **Only penalize for non-compliance** when flexibility/curtailment events fall within pre-defined parameters
-  **Repeated non-delivery** should result in downgraded participation or, for serial offenders, expulsion
-  **Penalties should be commensurate with system impact** of non-delivery

Approach to Costs

-  **Large loads** should bear costs for flexible capacity or network upgrades (if required) to shield other customers from them. Increased revenues from speed to power could offset any program costs.

¹ In order of response mentions, from most to least

Large Load Customers: Response Breakdown

Respondents' views on incentives, CRCs, and program parameters

	Respondent ¹	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13
Incentives (Non-CRC)	Speed to power													
	Reduced demand charges													
	Offset IRAS requirements													
Incentives (CRCs)	\$/CRCs for performance													
	\$/CRCs for availability													
	Value avoided deferred T/D													
	Value add. headroom													
Program Parameters	Tech-agnostic program?													
	Non-dispatchable eligible?													
	Punitive vs lenient penalty													

KEY Key incentive Referenced Yes No Lenient Balanced Punitive

¹ Fully anonymized. Note blank cells in this table do not necessarily mean that the incentive is not important to the respondent, rather they did not mention it or engage with the relevant question(s)

Topic 3: Fundamental Program Tenets

Based on:

- Your survey responses
- SB 371/ HB 284 language
- Dominion's operational realities

Dominion's proposed program tenets (1/2)

These will shape continued development of Dominion's LLDF program(s) ahead of Working Group session #2



Eligibility: Technology eligibility should be limited to dispatchable, flexible capacity.



Program parameters: Dominion will clearly lay out event triggers for the LLDF program(s).



Locational value: At least one program will focus on locational value of flexible capacity to help relieve localized congestion.



Transparent data: Where program design depends on accurate, up-to-date locational signals, Dominion will communicate these.



Costs: Large load customers should bear costs associated with program participation and wider program management, including costs for flexible capacity development, required upgrades, and program administration.

Dominion's proposed program tenets (2/2)

These will shape continued development of Dominion's LLDF program(s) ahead of Working Group session #2



Aggregators: Third party aggregators will be eligible to participate in programs alongside large load customers, where relevant.



Standard program(s): LLDF program(s) will be standardized.



Capacity Credits: Where incorporated into LLDF program(s), Dominion will design CRCs to reward local congestion relief separately to system-wide capacity adequacy relief.



M&V: Delivered flexibility from any dispatchable technology with built-in telemetry should be measured and verified on the basis of that telemetry.

Appendix: Recap of System vs Locational Flex

Demand flexibility can provide both system-wide and local congestion benefits



System Peak

Demand response from **any part of Dominion LSE** can help support generation capacity adequacy



Localized Transmission Availability

Only demand flexibility from **electrically proximate resources** can help address local transmission congestion

