Large Load Demand Flexibility: Stakeholder Working Group Session #2

10/14/26

Note: Program-related content reflects latest thinking as of 10/14, not final program designs that will be filed

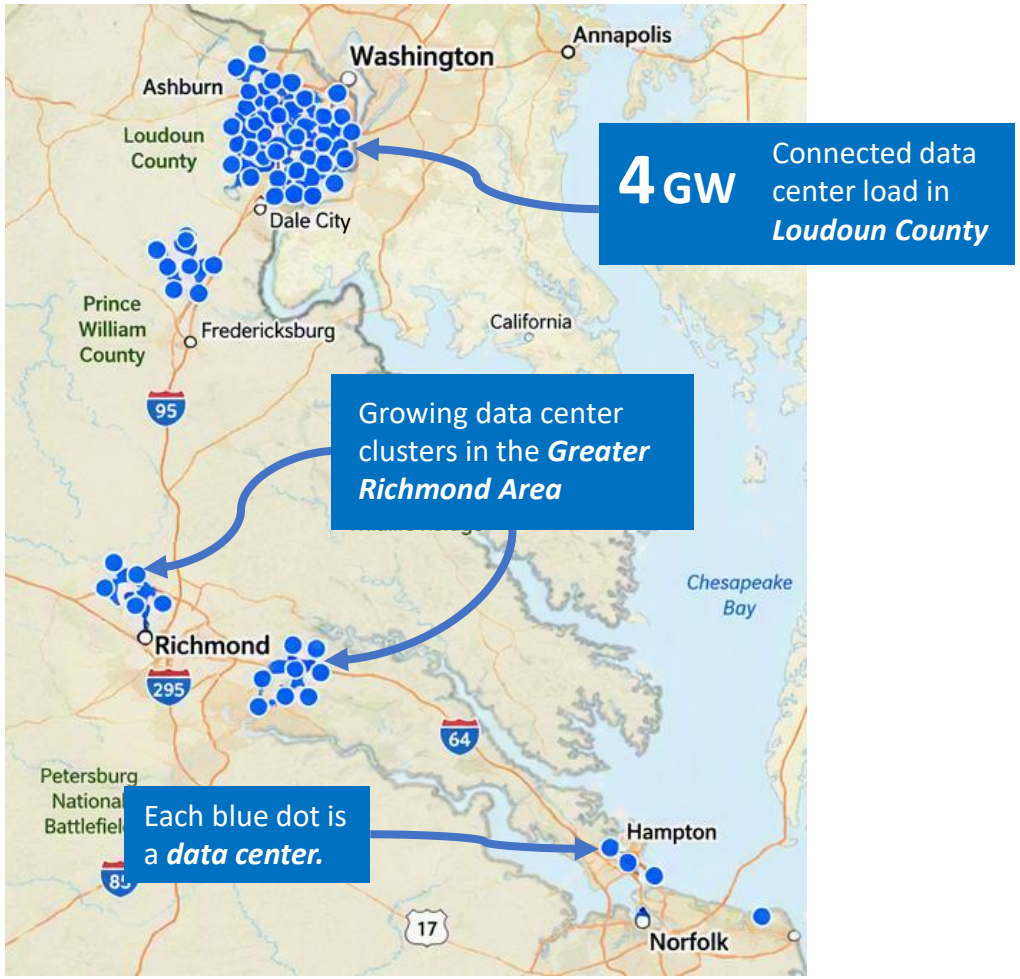
Recap: What we're seeing in the DEV Zone

Building a shared understanding of how DEV has accommodated and will continue to accommodate significant large load growth

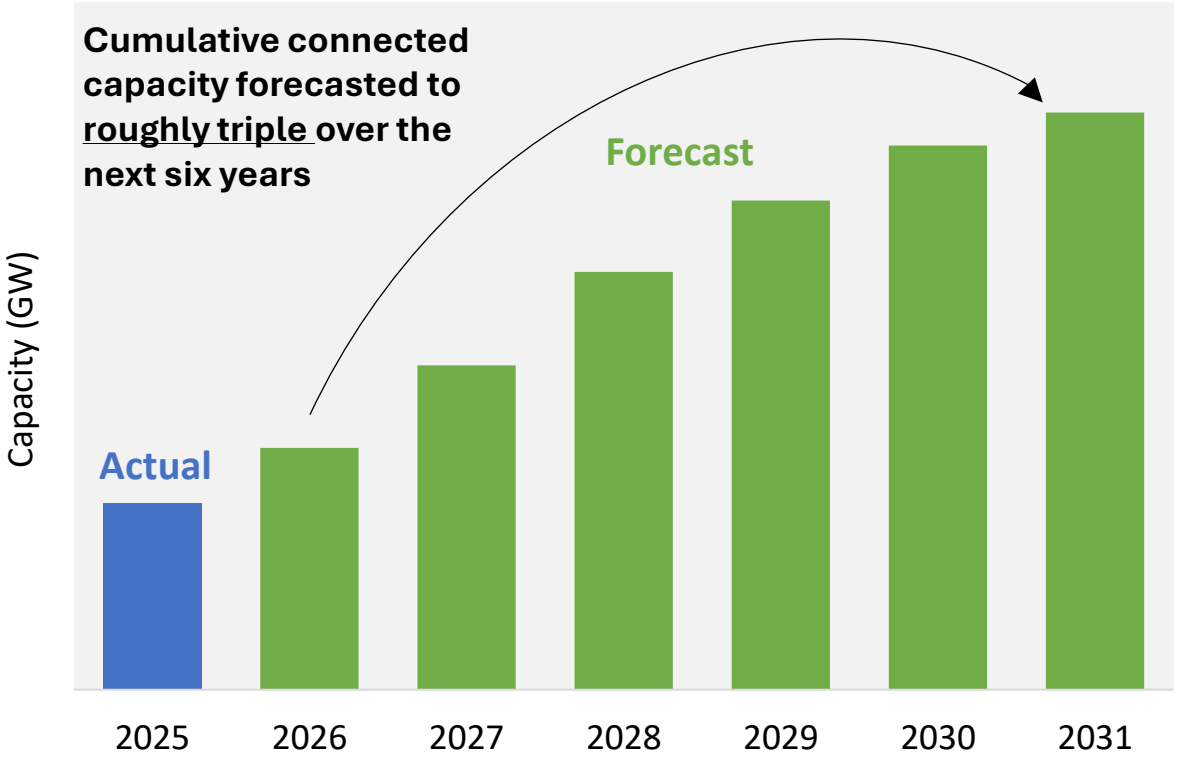
We have connected unmatched data center capacity

…and are *already in the process* of connecting significant additional capacity

Today: DEV-managed large load clusters – one of the most concentrated data center markets in the world



Future: DEV is connecting 20+ GW of new large loads within the LSE by 2031. Post-2031, a further ~45 GW is batched for future connection dates



DEV is managing this unparalleled large load concentration while maintaining reliability

DEV operates its system to *N-1 conditions*

This means the power grid can keep running safely if any one single component fails

What is N-1?

N-1 ← Sudden loss of one piece of equipment

All equipment needed to run the system normally

Goal: Prevent a single breakdown from causing cascading blackouts or loss of power to customers

Operations: DEV is required by NERC to maintain grid reliability and stability. Dominion must act if maintaining N-1 is at jeopardy

Planning: If power flow models show a failure would overload other lines, planners **add new infrastructure** before a real emergency happens

What conditions *may* threaten N-1?

Scenario	Type
Generation trip	Real time operational event
Fault (e.g., weather-driven)	Real time operational event
Maintenance and line upgrades	Planning Event
Added load growth (New large loads)	Planning Event

How does DEV maintain N-1?

- **Corrective actions:** First try line switching and generation redispatch in the event of an N-1 contingency.
- **PCLLRW[1]:** If a PCLLRW is declared and the next contingency happens, DEV will take immediate load-shedding action.

[1] Post Contingency Local Load Relief Warning

What if corrective actions are not sufficient?

Post-contingency warnings and subsequent actions come into play to maintain N-1

Dominion uses 'PCLLRWs' as an indicator of grid stress prior to a point of failure, at which point the post contingency happens

PCLLRW = Post Contingency Local Load Relief Warning

Origin: PJM issues a PCLLRW as an emergency procedure to indicate a localized threat to DEV's[1] system

Localized: Addresses N-1 stress on *specific transmission facilities or areas*, not necessarily a system-wide shortage

Preventative: Alerts operators that *immediate action will be needed* to prevent system being compromised. Importantly, it signals that **standard operational actions are not available to alleviate a post-contingency emergency**

(i.e. line switching and generation redispatch are not available to deploy should the contingency occur)

Action-oriented: PCLLRW provides a load shed plan should a contingency occur.

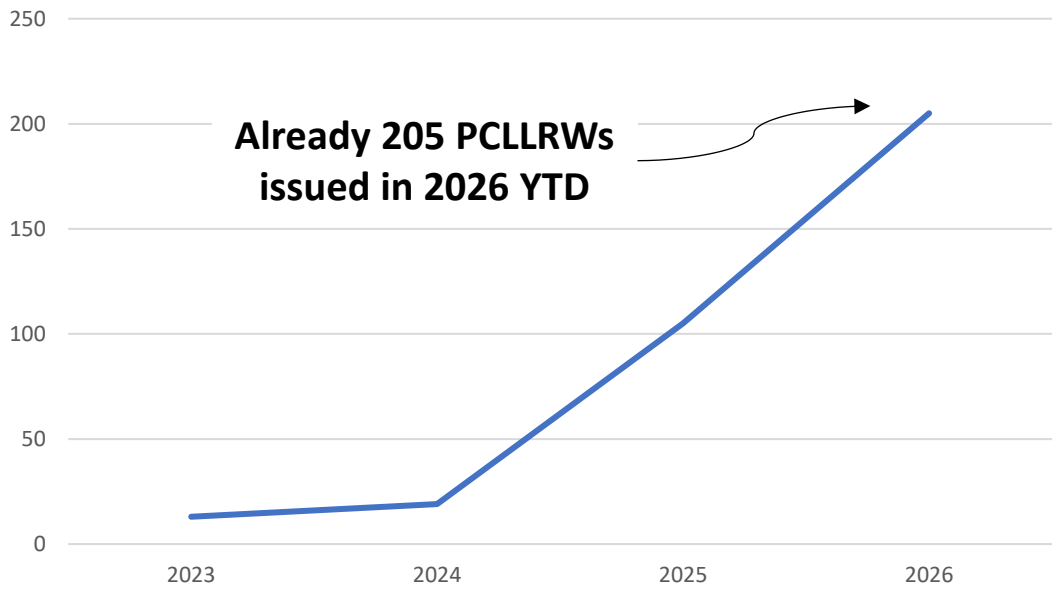
[1] Or any other Transmission Owner

PCLLRWs are now more frequent and lasting longer

This is increasing DEV's operational strain

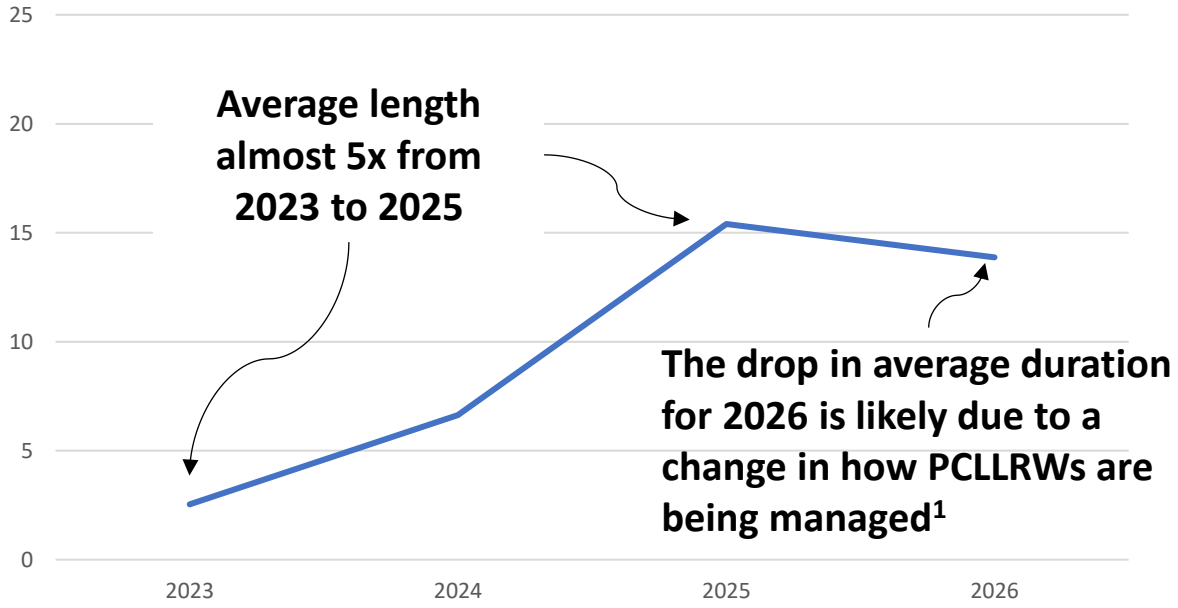
PCLLRWs are occurring more often

Number of PCLLRWs issued for DEV Zone / year



An average PCLLRW length is trending longer

Avg. length of PCLLRW issued for DEV Zone / year (hours)



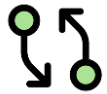
[1] Instead of leaving PCLLRWs active throughout the week, they are more frequently ended and reissued daily as needed, resulting in shorter individual durations and hence a lower average

PCLLRWs demand a localized response

Electrically proximal resources to provide local congestion relief in response to a PCLLRW

Electrically proximal points on the grid that share nearly identical electrical characteristics because they are:

1) **Physically close enough**, or
2) **Physically distant but connected with low resistance**



Two points could be physically close but **not** be electrically proximal because they are on different circuits



Resources are **highly impacted** by changes in grid conditions at an electrically proximal point.



Equally, electrically proximate resources play an outsized role in relieving local grid stress.

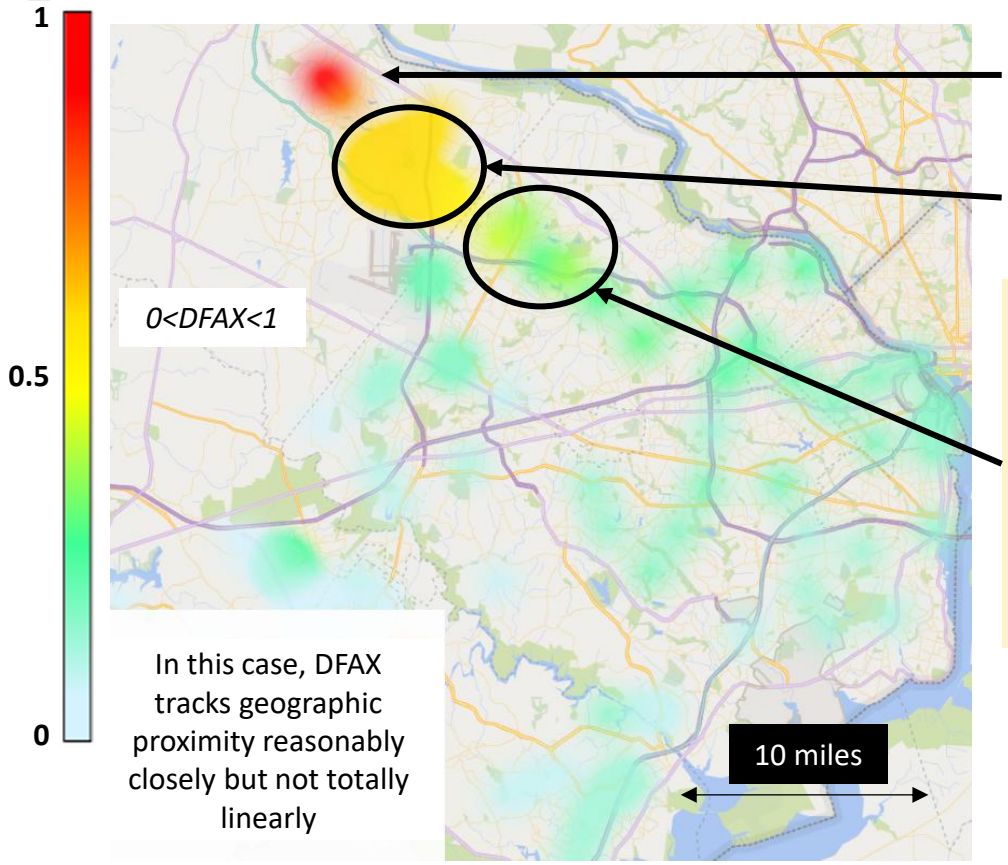
DEV can evaluate electrical proximity using DFAX



Dominion uses DFAX to measure electrical proximity

Distribution Factor (DFAX) estimates how a change in power flow at one location impacts the power flow at another.

Example DFAX map for a node in Northern Virginia



In this case, DFAX tracks geographic proximity reasonably closely but not totally linearly

This is the location of the constrained node itself

Electrically proximate lines have a relatively higher DFAX

- In this example, the DFAX falls to less than 0.5 a short geographic distance from the constrained node
- This is not always the case. DFAX falls quickly here due to the localized nature of power flows in a high-power dense area like Loudoun County.
- Under different system conditions, such as outages, DFAX could remain significant even at locations that are geographically further from the constrained node.

If a PCLLRW is issued for this constrained node, flexible capacity with DFAX closer to 1 will have a much greater impact on transmission congestion than less electrically proximate resources

Recap: Fundamental LLDF Program Tenets

We discussed a set of program tenets for the LLDF programs that DEV files in January

DEV's proposed program tenets (1/2)

These have shaped development of the three LLDF programs we will take you through today

Eligibility: Technology eligibility should be limited to dispatchable, flexible capacity. This includes capacity off-site from the large load that may be managed by third party aggregators on behalf of large loads.

Program parameters: DEV will lay out event triggers for the LLDF program(s) and accompanying event parameters, where practical.

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 where permitted.

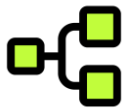
Costs: Large load customers should bear costs associated with program participation and wider program management, including costs for flexible capacity development, required upgrades, and program administration.

DEV's proposed program tenets (2/2)

These have shaped development of the three LLDF programs we will take you through today



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



Capacity Reduction Credits (CRCs): For programs incorporating a CRC, DEV will design CRCs to reward local congestion relief separately to system-wide capacity adequacy relief.



M&V: Delivered flexibility from any dispatchable technology should be measured and verified leveraging the most precise standards available (e.g. device telemetry).



Clean: Only non-carbon emitting flexible capacity will be eligible to participate in any LLDF program(s).



PJM: Where relevant, the design and operation of LLDF program(s) will be coordinated with PJM, and act as complement to PJM initiatives.



Accelerated interconnection: At least one program will offer accelerated interconnection to large loads as an incentive in return for increased flexibility.

Introducing our three proposed LLDF program concepts

We propose **three** different program concepts

Note: Program designs are not finalized and subject to further development

Our *three* proposed LLDF program concepts

The program concepts cover a mix of incentives and use cases

Program concept	① Connect & Flex (C&F)	② Local Demand Flexibility (LDF)	③ System Capacity Reduction Credits (CRCs)
What	Accelerated interconnection for large loads in return for capacity being fully curtailable	Large load builds or sponsors flexible resources for alleviating local transmission congestion. Incentives differ for C&F sites and existing firm large loads	Large load receives CRCs for *new* non-emitting flexible resources they fund across Dominion's LSE. CRCs used for future BYONC or flexibility requirements, and/or *potential* queue acceleration.
Stakeholder desire met	Offers accelerated interconnection	Aggregators and tech providers can partner with large loads to expand flexible resources, in this case for local congestion	• *May* offer *potential* queue acceleration • Aggregators and tech providers can partner with large loads to expand system-wide flexible resources

Let's dive into each program concept

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect & Flex

WHAT	**Accelerated interconnection for fully curtailable non-firm load**
WHY	**Meets customer requests for accelerated interconnection that aligns with DEV's operational realities**
WHO	**Customers currently in the study queue**
FLEX FROM	**The large load itself**

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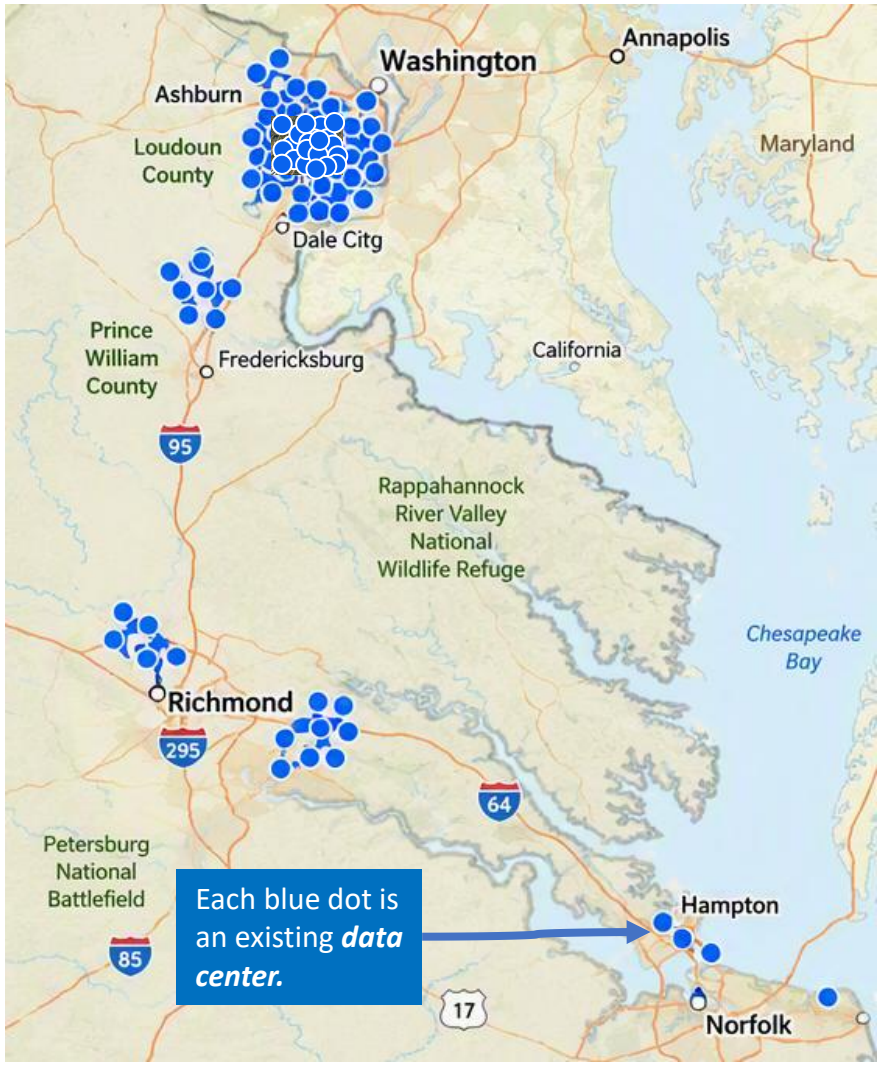
Let's bring Connect & Flex to life with an illustrative example

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Let's zoom into Data Center Alley…



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#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Let's zoom into Data Center Alley…



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#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

A new data center in the queue will be sited here once built…

If built fully firm:

- **300 MW capacity request**
- **2031+ connection date**

Illustrative Diagram



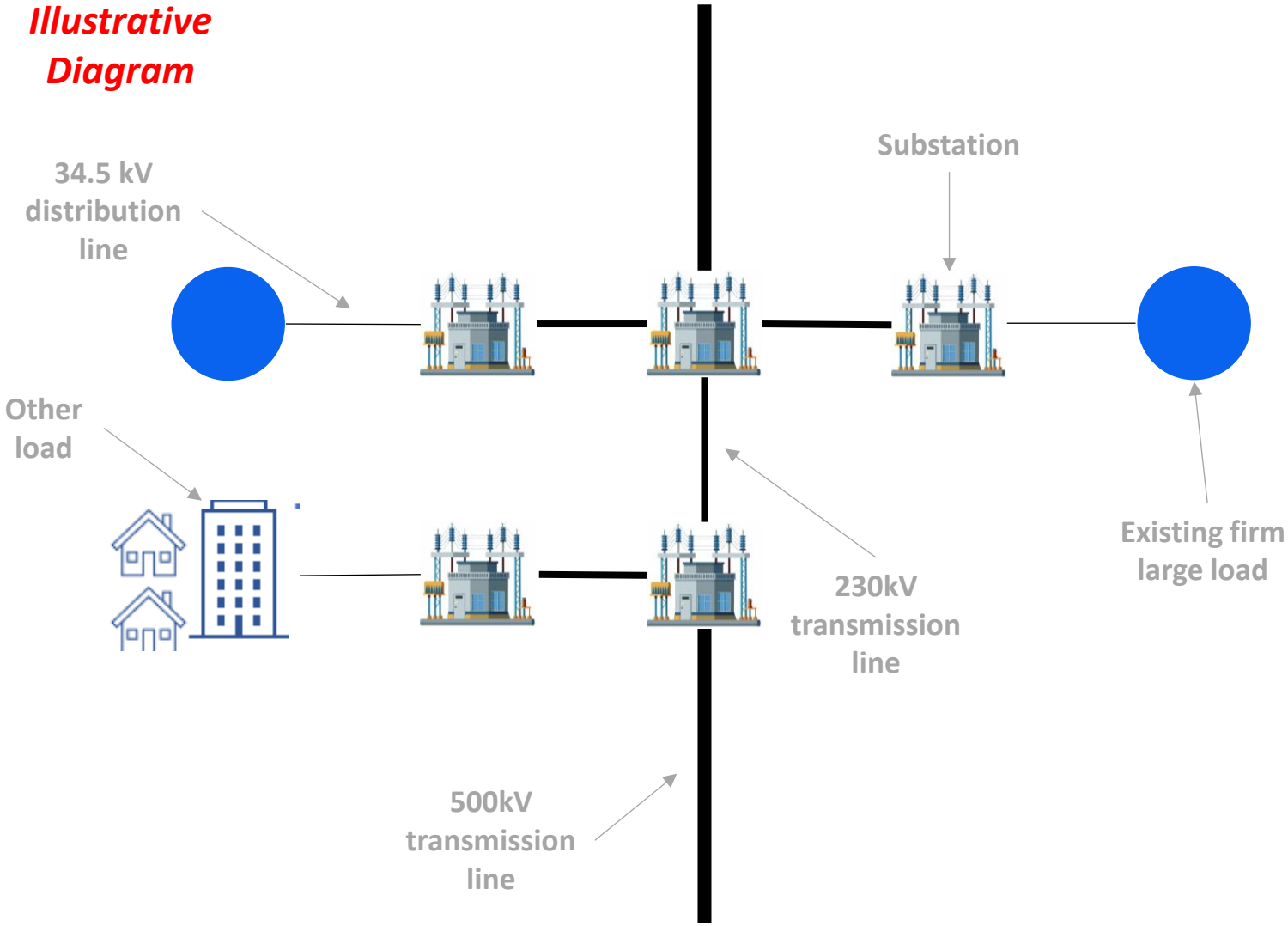
Let's look at an *illustrative* electrical system view…

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Illustrative Diagram



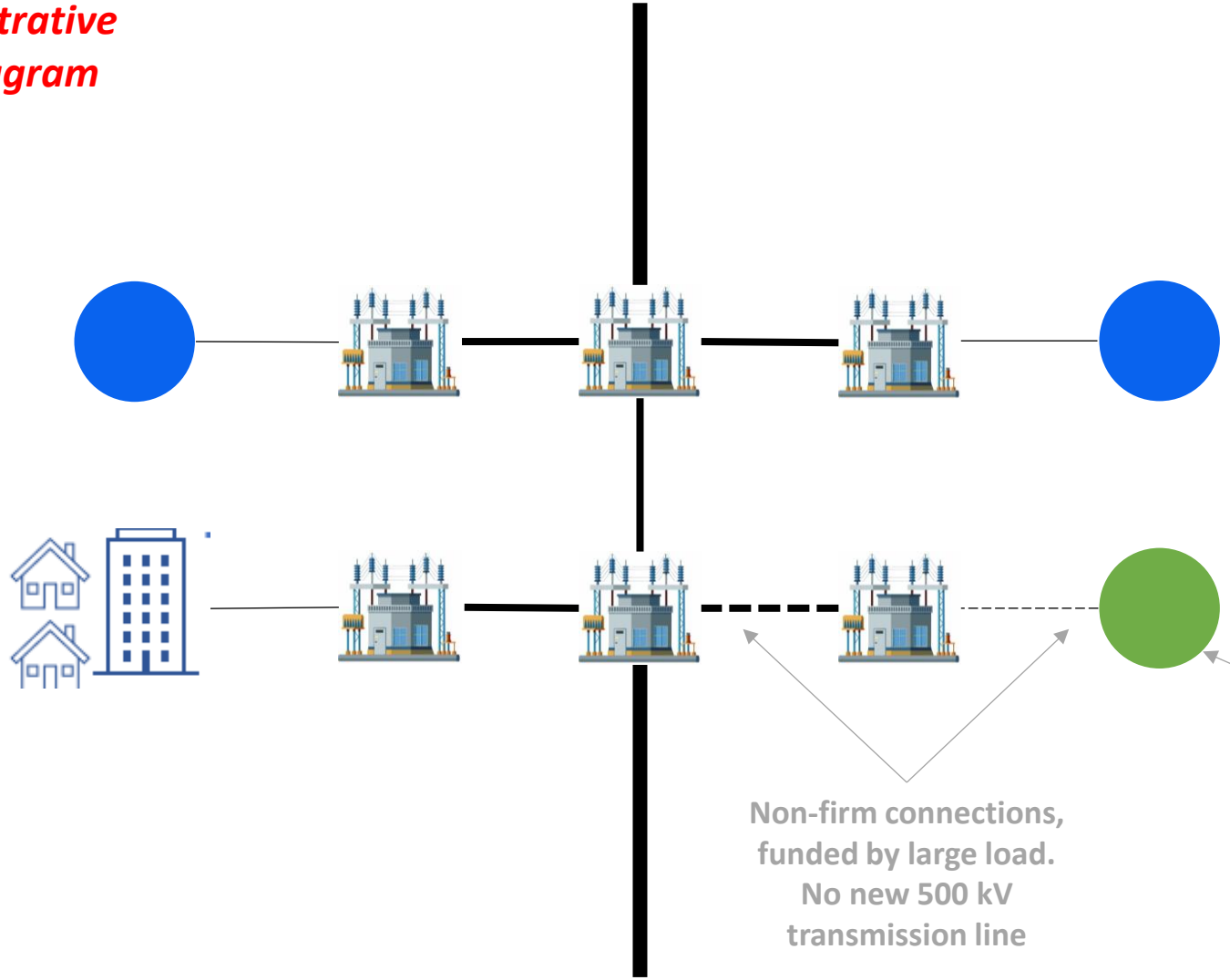
Today, all connections are fully firm

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Illustrative Diagram



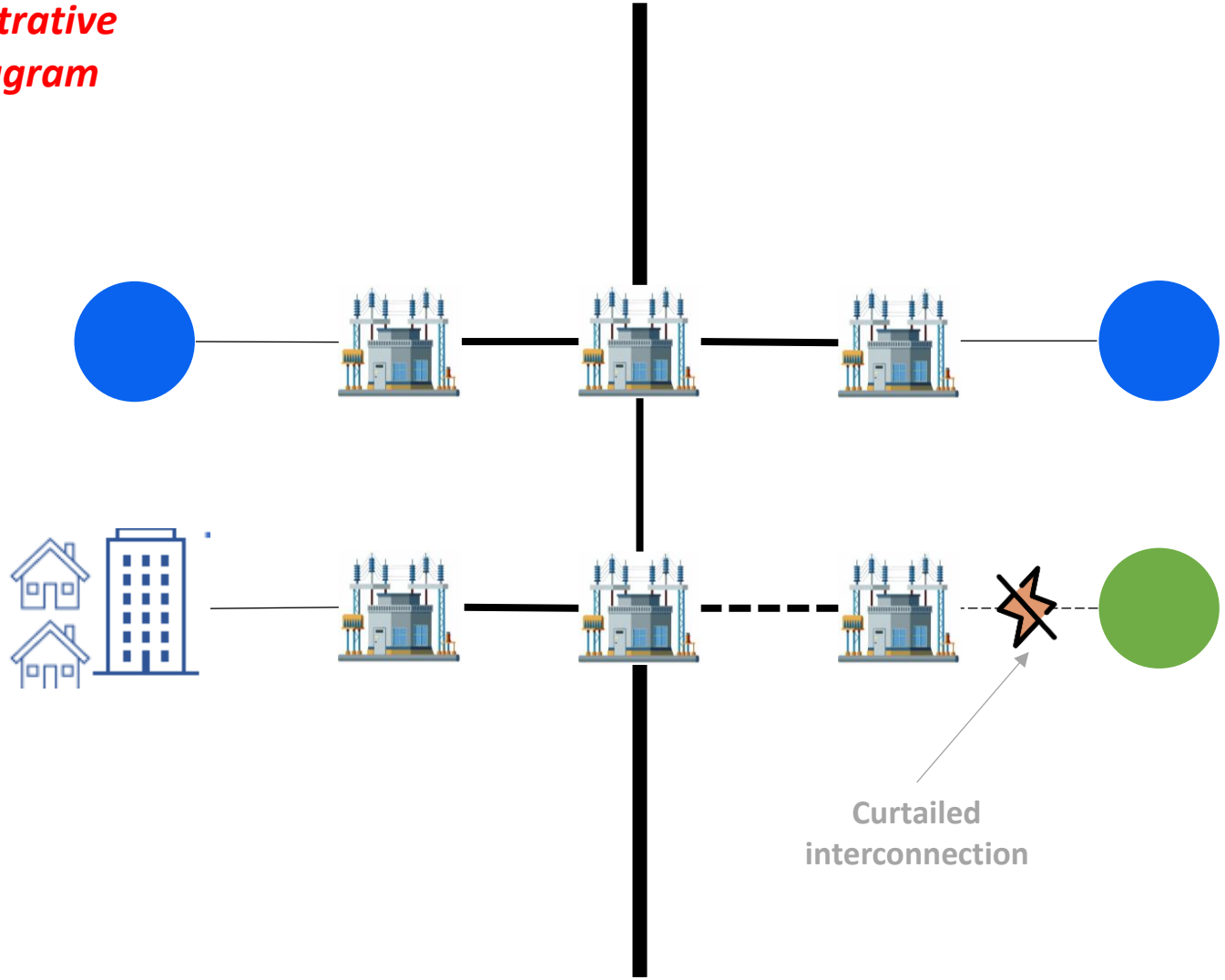
Through Connect & Flex (C&F), the data center connects <u>part of its capacity</u> sooner than 2031 on a non-firm basis…

Note: This reflects program concepts as of 10/14. They are *<u>not</u>* finalized designs and are subject to further development

#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Illustrative Diagram



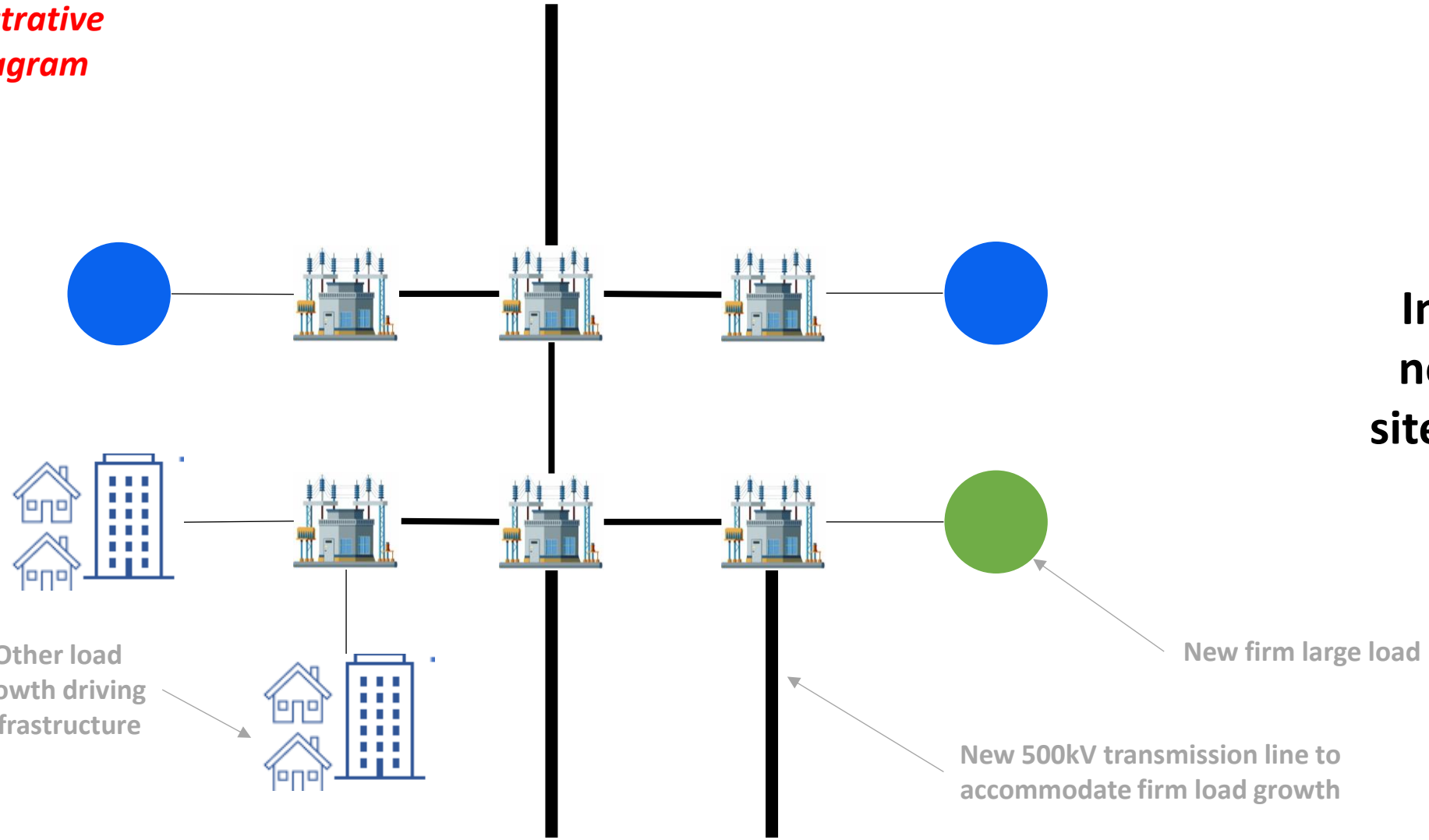
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#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

Illustrative Diagram



In 2031+, the new 300 MW site can connect fully firm

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect & Flex

Accelerated interconnection for fully curtailable non-firm load

What could this look like at macro scale?



Illustrative Diagram

At macro scale, a load pocket could at times have incremental headroom to accommodate multiple non-firm C&F large loads

→

C&F therefore makes use of that periodic headroom to accommodate non-firm load

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect and Flex

Alignment with overall LLDF program tenets, subject to further development (1/2)

Accelerated interconnection: This program offers accelerated interconnection to large loads in return for being fully non-firm

Eligibility: The flexibility enrolled in this program comes in the form of non-firm large load. *Dispatchable, flexible* capacity is covered in programs #2 and #3. Large loads in the study queue are eligible

Standard program(s): Tariff terms will be standardized for any C&F site

Program parameters: The trigger for a C&F site to ramp down will be structured to ensure grid reliability and security. The curtailment sequence dictates whether a C&F site is called to ramp down. There will be MW caps for individual sites and load pockets.

Locational value: A site's DFAX relative to the constrained element feeds into its position in the curtailment sequence.

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#1: Connect and Flex

Alignment with overall LLDF program tenets, subject to further development (2/2)



Transparent data: We intend to provide look-backs and look-forwards for specific load pockets to provide an indicative idea of how often a C&F site in the load pocket could expect to ramp down, and to shape load pocket C&F capacity caps.



Costs: Large loads bear program administration costs and infrastructure costs associated with the non-firm interconnection.



M&V: Sites must integrate to provide DEV real-time visibility to ensure program compliance. Non-compliance with a curtailment request will result in service disconnection.



Clean: C&F sites can use any permitted technology to cover periods of grid connection ramp down. However, only non-carbon emitting flexible capacity will be eligible to help sites improve their position in the curtailment sequence per the LDF program.



Capacity Credits: Not relevant for this program.



PJM: Dominion will coordinate with PJM as necessary

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility (LDF)

Dominion Energy

Guidehouse

WHAT

Using non-emitting flexible resources built or sponsored by large loads to alleviate local transmission congestion

WHY

- **Gives DEV additional tools to operate the grid more reliably**
- **Gives aggregators and tech providers a route to partner with large loads to expand flexible resources and DERs**
- **Gives C&F large loads a route to move further down the curtailment sequence for a specific event**
- **Gives large loads the opportunity to build community goodwill by subsidizing commercial and residential devices**

WHO

Any large load > 25 MW, load factor > 75%

FLEX FROM

- **On-site dispatchable flexible resources at existing firm large loads**
- **Off-site dispatchable flexible resources sponsored by existing firm and C&F large loads**

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development



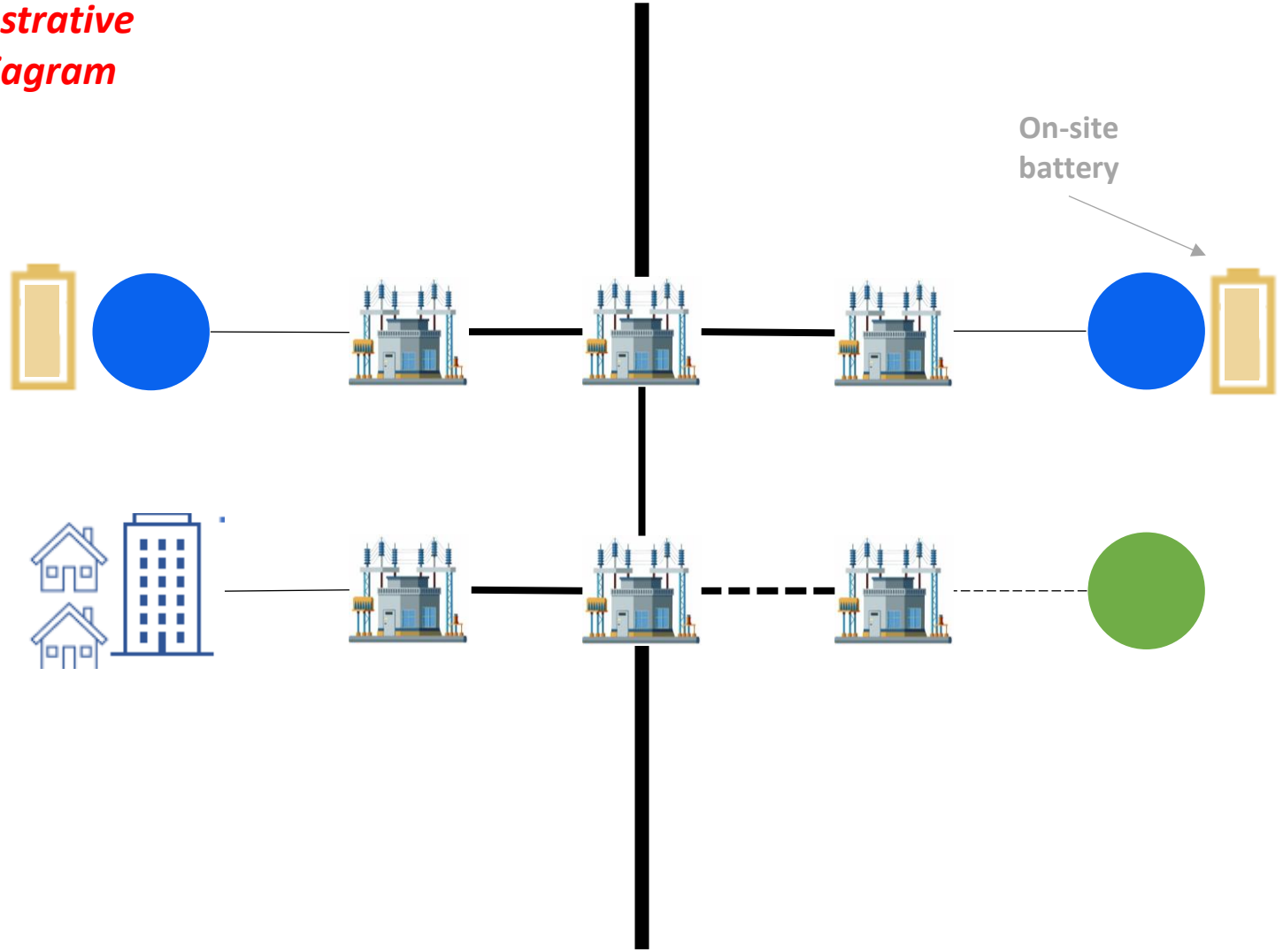
Let's bring LDF to life with an illustrative example

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility

Large load sponsored non-emitting flexible resources to alleviate local transmission congestion

Illustrative Diagram



Existing firm sites can enroll non-emitting flexible capacity into the LDF program, *including on-site resources*

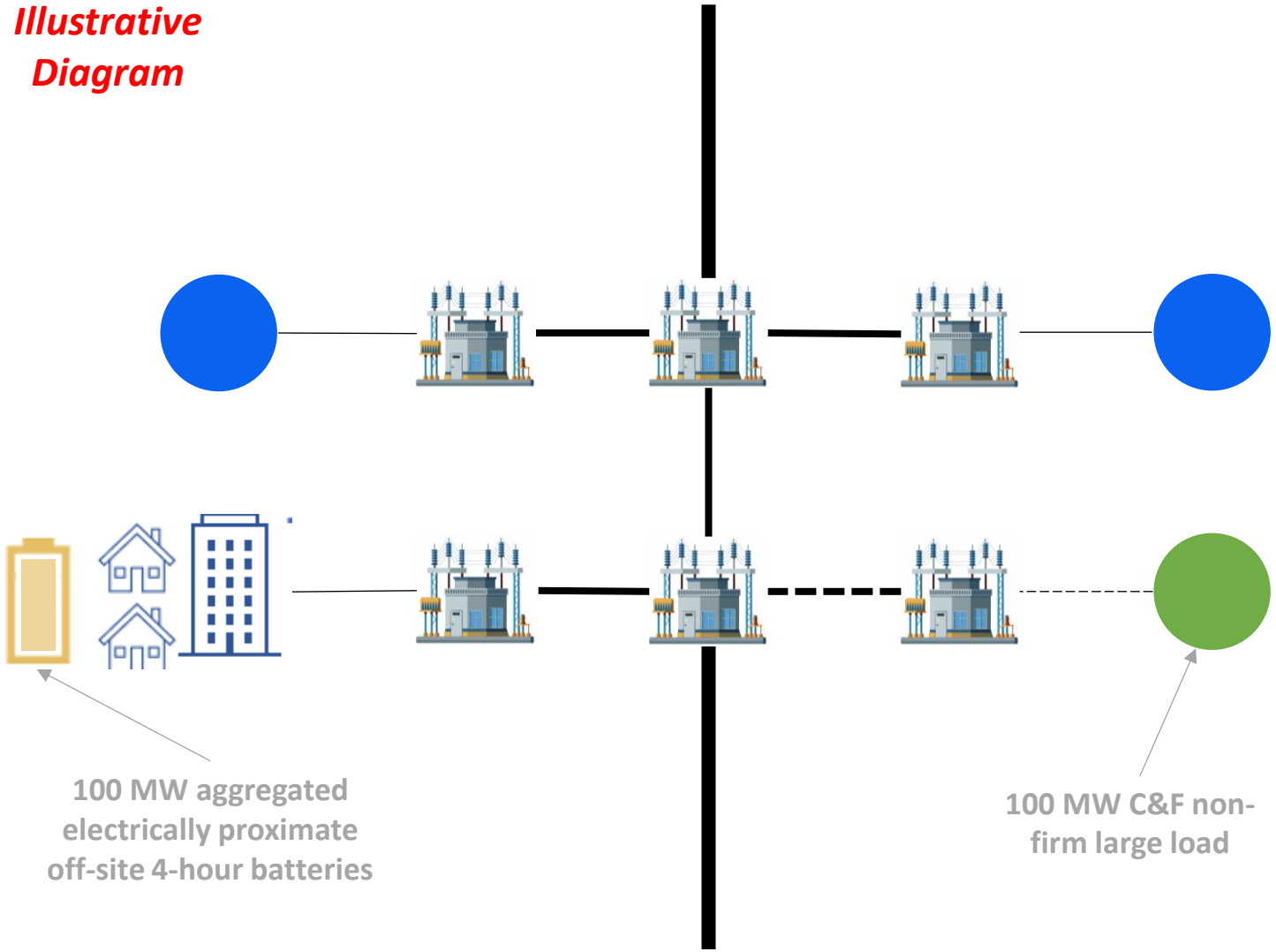
If built by the existing firm site, the site is paid for their use in LDF events

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility

Non-emitting flexible resources to alleviate local transmission congestion

Illustrative Diagram



Both existing large loads and C&F customers can contract bilaterally with aggregators to sponsor off-site resources

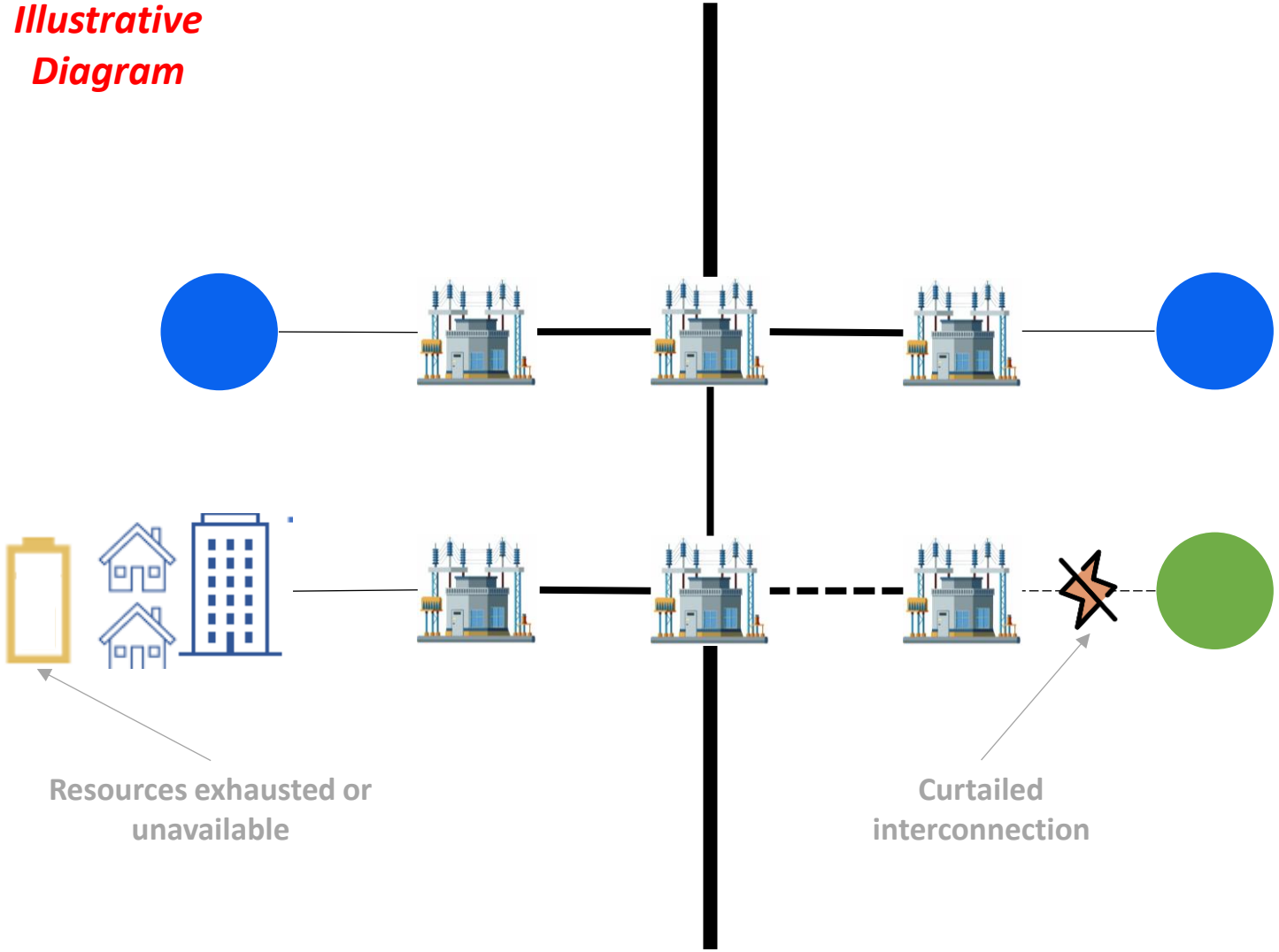
Here, the C&F site sponsors the building of 100 MW of off-site batteries and enrolls them into the LDF program. These will be called before the C&F site is curtailed

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility

Non-emitting flexible resources to alleviate local transmission congestion

Illustrative Diagram



If resources are exhausted or unavailable, then the C&F site may have to curtail, subject to its position in the curtailment sequence

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility

Large load sponsored non-emitting flexible resources to alleviate local transmission congestion

Eligibility

Any flexible capacity enrolled in LDF must be:

- **Non-carbon emitting** → generators not allowed
- **Dispatchable** → to be responsive during events
- **Electrically proximate** → DFAX must be high to be effective at relieving the constrained pocket
- **Visible to DEV's SOC[1]** → so it can be called for dispatch in relevant constraint events

Costs

The resources must be paid for by the sponsoring large load, either:

- **Directly** for on-site flexible capacity
- **Indirectly** for off-site flexible capacity, via bilateral agreements with aggregators

Benefits

The benefits for providing flexibility with flexible capacity in the LDF program depend on the type of large load:

- *Non-firm C&F large load*:
  - **Improved placement in the curtailment sequence** using recent historical flexibility performance
- *Existing firm large load:*
  - **Monetary compensation**

[1] System Operating Center

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#2: Local Demand Flexibility

Alignment with overall LLDF program tenets, subject to further development (1/2)



Locational value: This program focuses on local transmission congestion. Resources enrolled in this program must be electrically proximal to the load pocket in which the large load funding the resource is sited.



Eligibility: Any large load > 25 MW, > 75% load factor can participate. Only non-carbon emitting, dispatchable, flexible capacity is eligible for the program. The capacity can be on- or off-site



Clean: LDF resources must be non-carbon emitting



Program parameters: The trigger for LDF resources will be structured to ensure grid reliability and security. LDF resources will be activated before any C&F curtailment is required



Costs: Large loads bear the cost of program administration, and costs associated with the LDF resources they directly build or sponsor through an agreement with an aggregator



Standard program(s): LDF terms and conditions will be codified in a tariff

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#2: Local Demand Flexibility

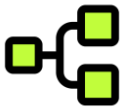
Alignment with overall LLDF program tenets, subject to further development (2/2)



Transparent data: We intend to provide look-backs and look-forwards for specific load pockets to provide an indicative idea of where LDF resources are most valuable.



M&V: Delivered flexibility from any dispatchable technology should be measured and verified leveraging the most precise standards available (e.g. device telemetry).



Capacity Credits: This program does not have a capacity credit, though the performance of a C&F site's LDF resources is tracked and factors into its position in the curtailment sequence



PJM: We will coordinate as needed with PJM



Accelerated interconnection: Not relevant for this program

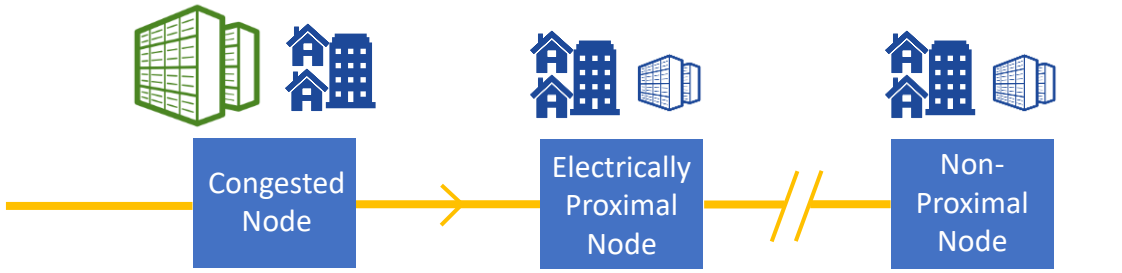
Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

Recap: Locational vs System Flexibility

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

Localized Transmission Availability

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



Demand flexibility **may help to relieve congestion**

Demand flexibility **may not help to relieve congestion**

Programs #1 and #2 focused on local transmission congestion

System Peak

Demand flexibility from **any part of Dominion's LSE** can help support generation capacity adequacy

Program #3 focuses on maximizing system savings

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#3: System Capacity Reduction Credits (CRCs)



WHAT

Large loads fund *new* demand flexibility resources in DEV's service area. These resources are used to create accredited CRCs for addressing future Federal or State flexibility requirements, and/or *potentially* queue acceleration



WHY

Accredited CRCs can:

- **CRCs can address future flexibility requirements or *potentially* offer queue acceleration**
- **Enable direct partnerships between aggregators and large loads to expand flexible resources and build community goodwill by subsidizing devices**
- **Facilitate resources to reduce system peaks, maximizing system savings for all retail customers**



WHO

Any large load > 25 MW, load factor > 75%



FLEX FROM

- **Large load new on-site flexibility resources**
- **Large load new sponsored off-site flexible resources (e.g., partnership with aggregator)**

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#3: System Capacity Reduction Credits

The use case(s) for the CRCs will be driven by future policy and regulatory decisions, which remain uncertain

Meeting future Federal or State requirements

- In future, there may be Federal or State-level BYONC or flexibility requirements for large loads

CRC-accredited new flexibility could help large loads meet these requirements

Potential queue acceleration

- SCC has expressed interest[1] in a 'fast-track' large load queue **based on load flexibility commitments**
- Evaluating potential to accelerate new large loads by **directly funding new flexible capacity**

Credited new flexibility *may* accelerate a large load in the batch study process

[1] In its interim order on Dominion's large load queue proposals

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#3: System Capacity Reduction Credits

A large load flexible resources framework to maximize system savings

What would the process look like?

1. ***Large Loads*** **fund new on-site or off-site flexible capacity in Dominion's LSE**
2. ***Dominion*** **accredits the rated[1] capacity with a CRC and manages a registry**
3. **The CRC is assigned to the *large load* that funded the capacity**
4. ***Dominion*** **dispatches the accredited capacity to support reliability, reduce peak load, and maximize system savings**

[1] Rated by various factors to account for its ability to respond to system peak events

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#3: System Capacity Reduction Credits

Alignment with overall LLDF program tenets, subject to further development (1/2)



Capacity Credits: The CRC is designed to reward system-wide capacity adequacy and demand flexibility resources



Eligibility: Only non-emitting, dispatchable, flexible capacity is eligible for a CRC. The capacity can be on- or off-site



Program parameters: CRC has multiple potential use cases. DEV will leverage the resources to maximize system savings and put downward pressures on costs for all customers.



Accelerated interconnection: Evaluating whether CRCs *may* offer queue acceleration for participating large loads



PJM: To the extent CRCs are utilized for PJM initiatives, the design and operation of the program will be coordinated with PJM to satisfy program requirements

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

#3: System Capacity Reduction Credits

Alignment with overall LLDF program tenets, subject to further development (2/2)



M&V: M&V standards may vary depending on the intended utilization of the CRC. Where telemetry is available, it will be used for M&V



Standard program(s): CRC definition will be standardized. No unique terms or conditions between Dominion and large load customers



Costs: Large loads bear any incremental costs associated with program administration or infrastructure.



Locational value: Flexible resources must be sited in DEV's Retail Electric Service Area.



Clean: Only non-carbon emitting flexible capacity will be eligible to receive CRC accreditation



Transparent data: Not applicable for this program

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

Recap: Our three proposed LLDF programs

The programs cover a mix of incentives and use cases

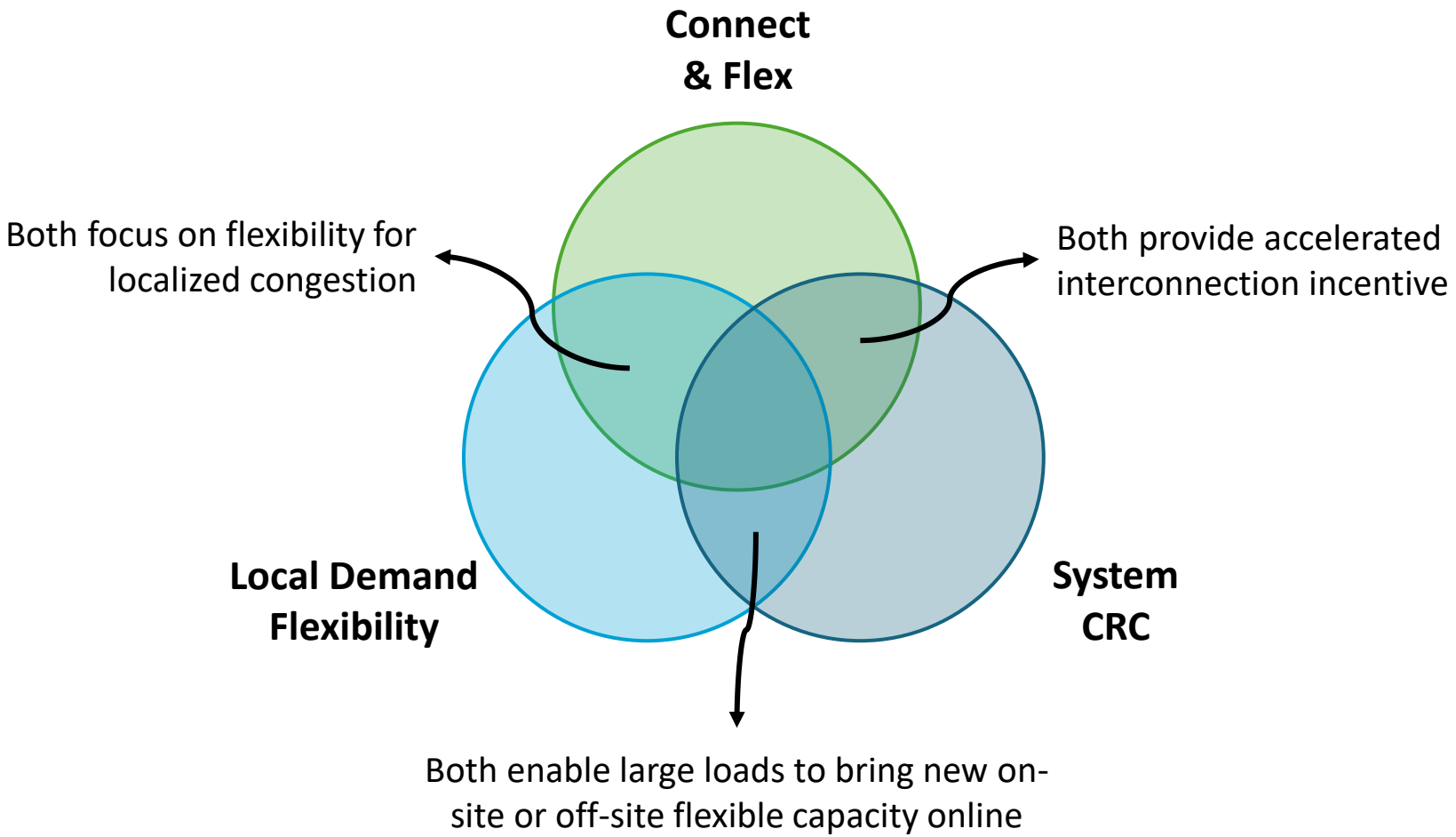
Program	① Connect & Flex (C&F)	② Local Demand Flexibility (LDF)	③ System Capacity Reduction Credits (CRCs)
What	Accelerated interconnection for non-firm fully curtailable large load capacity	Large load sponsored flexible resources for alleviating local transmission congestion	Large load receives CRCs for *new* flexible resources they fund across Dominion's LSE.
Incentive	Proportion of a site's requested capacity energizes earlier	LDF performance impacts curtailment order for sponsoring C&F sites, earns financial rewards for participating firm sites	CRCs address future flexibility requirements and *may* enable queue acceleration for participating large loads
Eligibility	Any large loads in study queue, subject to caps by load pocket and site	Large loads >25 MW, >75% load factor can participate and contract directly with aggregators & tech providers	Large loads >25 MW, >75% load factor can participate and contract directly with aggregators & technology providers
Legislative mandate met[1]	'Incentives may include… accelerated interconnection… provided [they] do not sacrifice reliability'	'Consider the extent to which localized solutions may help'	'Reasonably maximize electric grid savings and improve reliability' Consider 'capacity reduction credits' 'Reduce total system peak demand'

[1] From SB 371 text

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development

Program Concept Linkages

The program concepts are designed to interlink



Together, the programs:

- Incentivize large loads to provide flexibility
- Increase overall flexibility available to Dominion and PJM
- Do not pass any costs through to non-large load customers

Note: This reflects program concepts as of 10/14. They are *not* finalized designs and are subject to further development