IIRG
Flexible Interconnection Subgroup

Meeting #3 (11/03/25)

Timing & Agenda

Timing

- Discussion: 12-1p
- Break 1-1:15p
- Discussion: 1:15-2:15p
- Break: 2:15-220p
- Discussion & Wrap-up: 220-3p

Agenda

1. Recap roadmap &prioritization
2. Review Flex IX definition & objectives
3. Review Dynamic Flex IX programmatic elements & open questions
4. Planning/Schedule Flex IX workshop

Recap Roadmap & Priorities

High-Level Roadmap

Meeting Cadence: Bi-weekly meetings

1. Develop common understanding of Flex IX & current state for EDCs (October 2025)
2. Prioritize flex ix option(s) and use cases provide for program development (October 2025)
3. Identify key programmatic elements & open questions to address to develop a standardized flex IX offering (November 2025)
4. Develop programmatic details and implementation roadmap for priorities (TBD)
5. Implement and launch standardized Flex IX program (TBD)

Detailed Roadmap (Estimated Timelines – Subject to Change)

1. **Draft and send DPU letter with updates**
2. **Develop programmatic framework that identifies key elements and open questions** (Oct 2025 – present at next meeting)
   - Engage with ComEd & NY Utilities to inform framework
   - Engage with DER industry to identify priority locations and substations
   - Key elements may include: Curtailment strategies (% curtailment, curtailment allocation methodology, curtailment study template), financing/curtailment risk management, integration into IX process, identifying & prioritizing substations, program launch, DERMS scalability & long-term functionality etc.)
3. **Design & host in-person workshop to address programmatic details** (Oct-December 2025)
   - May include forum to identify priority locations and substations (TBD)
   - Establish workshop dates (December target)
4. **Develop draft Flex IX straw proposal** (Oct 2025-Jan 2026)
   - Iterative draft as subgroup works through roadmap + workshops
   - Addresses near-term plan for program
   - Addresses future process to expand & iterate on program (including grid compensation fund)
   - Incorporates lessons learned & existing templates from ComEd & National Grid NY programs where appropriate
5. **Notify IIRG & present Flex IX straw proposal** (Jan-Feb 2026)
6. **File with and brief DPU** (Q1 2026)
7. **Launch first iteration of Flex IX program** (TBD)

Dynamic Flex IX: Scenario Prioritization

Which scenarios should be prioritized?

1. Near-term Priorities
    1. Unlock capacity in constrained areas (e.g constrained stations, defer CIPs, fully subscribed CIPs etc.) – permanent*
    2. Unlock capacity in constrained areas while waiting for upgrades - bridge to wires solution (e.g individual projects w/ small upgrades, in-construction CIPs etc.)*
2. Long-term Priorities
    1. Unlock capacity in constrained areas via converting firm to non-firm
    2. Unlock greater capacity for sized LTSPP investments* (DERMS ready LTSPP investments)
    3. Downsize LTSPP investment and unlock same amount of capacity* (DERMS ready LTSPP investments)
    4. Unlock additional capacity in unconstrained areas

Review Definition

Flexible Interconnection: Definition (Feedback)

TSRG Sub-group Definition:

A Flexible Connection is when an asset is provided a Flexible Capacity Allocation. The asset will be able to connect where existing grid infrastructure can accommodate said capacity without the need for additional system modifications to the common distribution system. Additional capacity can be made available based on real time monitoring of grid conditions and available capacity. Flexible Connections use time-based dynamic controls to adjust generation output to grid conditions in real time.

The goal being to enable DER projects in appropriate areas to interconnect to avoid significant distribution system upgrades, while reducing costs and timeframes associated with the standard interconnection process. This includes defining policy on how curtailment will work for DERs. Success may allow for faster and cheaper integration of DERs by increasing the hosting capacity of existing grid infrastructure and/or increased penetration of DERs to the grid.

Proposed Adjustments:

- Be explicit this definition is for the DER industry (maybe apply to EVs/load)
- Encompasses a broad set of approaches (both firm/static and non-firm/dynamic)
- Encompasses multiple resource types (solar + storage, standalone storage, EVs/load etc.)
- Add safe guard: Flexible Connections must remain within the physical and operational limits of the distribution system, including feeder phase configuration, thermal ratings, voltage constraints, and protection requirements. Flexibility does not override these fundamental infrastructure limitations
- Specify and call out different approaches (i.e dynamic DERMS based Flex IX)
- Other goals may include improved system utilization and maximizing DER penetration (potentially separate from definition)

Does this definition capture the different Flex IX approaches?

Flexible Interconnection: Definition (Proposed)

Proposed Definition:

Flexible interconnection is the ability to leverage several different DER control approaches to more quickly and/or cost-effectively connect some or all the desired DER capacity that would otherwise not be able to connect under a traditional firm interconnection provided these connections remain with the physical and operational limits of the distribution system. Flexible interconnection would be applicable to a broad set of DERs (i.e solar, solar + storage and standalone storage) and includes DER control approaches that range from static controls to time-based dynamic controls to adjust generation output based on pre-determined schedules or real time conditions.

Objectives:

Flexible interconnection can achieve several objectives depending on the specific approach and use case:

- Reducing timeframes to connect some or all of capacity
- Avoid significant distribution system upgrades
- Maximizing DER penetration
- Maximize utilization of existing infrastructure and/or future upgrades

Scope:

1. Focus on what we can do now without tariff/rule changes or approval (sets up rules of the road and serves as foundation for #2)
2. Waiting on Department guidance for broader guidance on program development

Review Dynamic Flex IX Programmatic elements & Open Questions

Key Programmatic Topics

Topic
Curtailment & Financing Strategy
Curtailment %
Curtailment Allocation Methodology
Curtailment Studies & Reports
Curtailment Risk Management & Financing
Interconnection Rules
Interconnection Process
Queue Management
Interconnection Agreement

Topic
Technical & Operational Requirements
Technical Standards & Guidance
Curtailment Notification & Reporting
Site Cost Estimates
Program Launch
DERMS Rollout & Substation Prioritization
Substation Capacity Calculation
Launch process & Communication

Topic
Other Items
ISO-NE & ASO Studies
Post-upgrade Paradigm & Free Ridership
DER Size Eligibility

Key Programmatic Topic & Open Questions

Topic	Objective
Curtailment & Financing Strategy	
Curtailment %	Determine standard/maximum curtailment % that can be financed and account for incorporation paired storage
Curtailment Allocation Methodology	Choose one or more methodologies to determine how much each facility is curtailed and in what order
Curtailment Studies & Reports	Develop standardized data inputs/outputs and template for studies while considering financing needs
Curtailment Risk Management & Financing	Develop strategies for developers to be able to successfully finance Flex IX projects (guarantees, more data etc.)
Interconnection Rules	
Interconnection Process	Determine whether Flex IX can be integrated into existing process vs. needing new process
Interconnection Agreement	Develop standardized template & terms for Flex IX agreement
Queue Management	Determine who will be offered Flex IX within existing queue vs. new queues'
Regulatory	
Tariffs	
Regulatory Approval	

Key Programmatic Topic & Open Questions

Topic	Objective
Technical & Operational Requirements	
Technical Standards & Guidance	Develop standardized documents outlining technical architecture, utility side equipment, customer site design requirements and backup/failure strategies.
Curtailment Notification & Reporting	Develop standardized approach for site operators will be notified of and receive data on curtailment
Site Cost Estimates	Develop cost estimates to meet customer site design requirements
Program Launch	
DERMS Rollout & Substation Prioritization	Develop process for rolling out DERMS and prioritizing substations
Substation Capacity Calculation	Develop standardized methodology to calculate substation flex IX capacity
Program Launch & Communication	Develop strategy for official launch of program and communication of information
Other Items	
ISO-NE & ASO Studies	Develop process for DERs under flex IX to be studied under ASO studies
Post-upgrade Paradigm & Free Ridership	Develop process for how Flex IX facilities are treated once an upgrade is necessary
DER Size Eligibility	Determine which sizes of DERs should be eligible for flex IX

Topic 1:
Curtailment Strategy

Curtailment %

Objective: Determine standardized/maximum annual MwH curtailment % that can be financed and used for curtailment studies

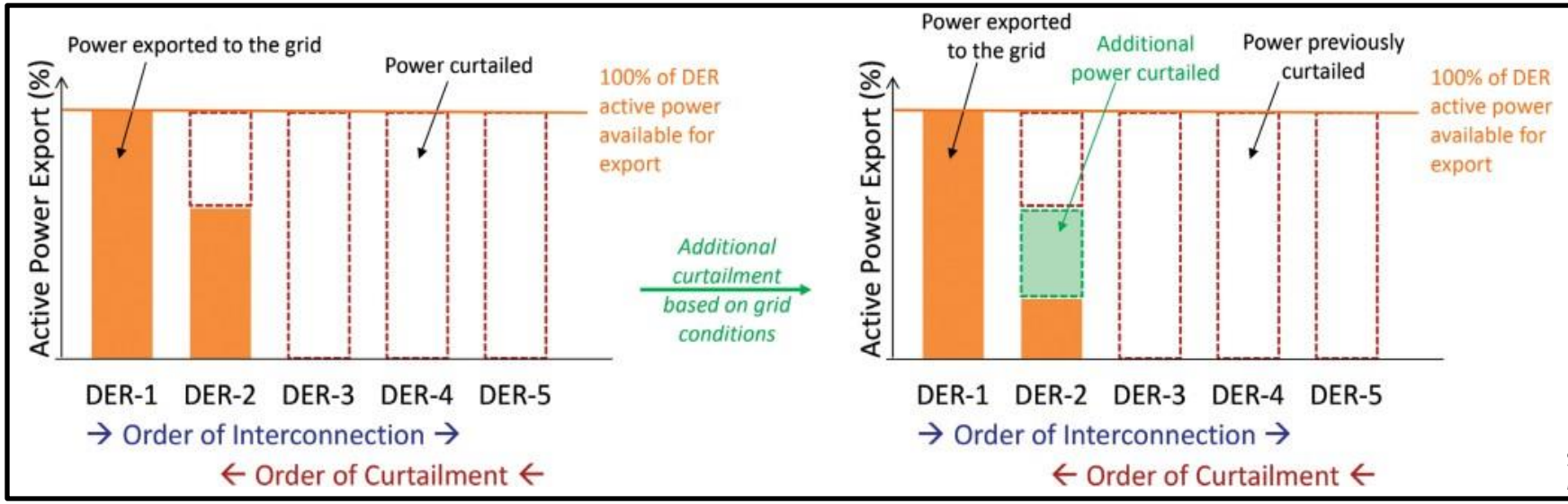
1. What standard annual MwH curtailment % can projects be financed at?
2. What are the current operating profiles of solar + storage and how does storage impact the curtailment tolerance? Can storage be used to offset curtailment and/or tolerate greater curtailment?
3. How does this vary for solar vs. solar + storage vs. standalone storage?
4. What have other jurisdictions decided?

Curtailment Allocation Methodology

Objective: Choose one or more methodologies to determine how much each facility is curtailed and in what order

1. What are the different curtailment allocation methodologies?
2. What are each methodologies pros and cons? How does this vary for individual developers vs. the market as a whole?
3. Is each methodology mutually exclusive or can be they be combined? If so, what are the scenarios?
4. What have other jurisdictions decided?

LIFO



The LIFO methodology is a widely adopted PoA across various utilities in both US and Europe, including UKPN, NGED, SPEN, Avangrid and more.

Source: Electric Power Research Institute- *Principles of Access for Flexible Interconnection Solutions*

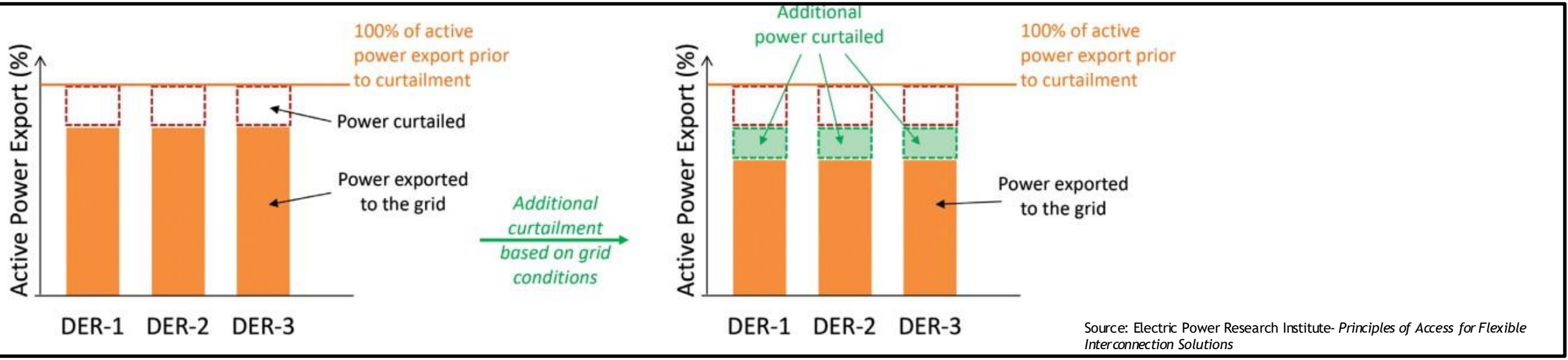
Pros

- Provide certainty for developers who accepted/contracted in the early phase before grid constraints intensified
- Encourages early adopters
- Simple to implement

Cons

- Discourage new entrants as they bear the highest curtailment risk, limit the total amount of capacity that can interconnect
- It favors early adopters without considering overall system optimization
- Negatively impacts customers who might have more complicated connections

PRO-RATA



Source: Electric Power Research Institute- *Principles of Access for Flexible Interconnection Solutions*

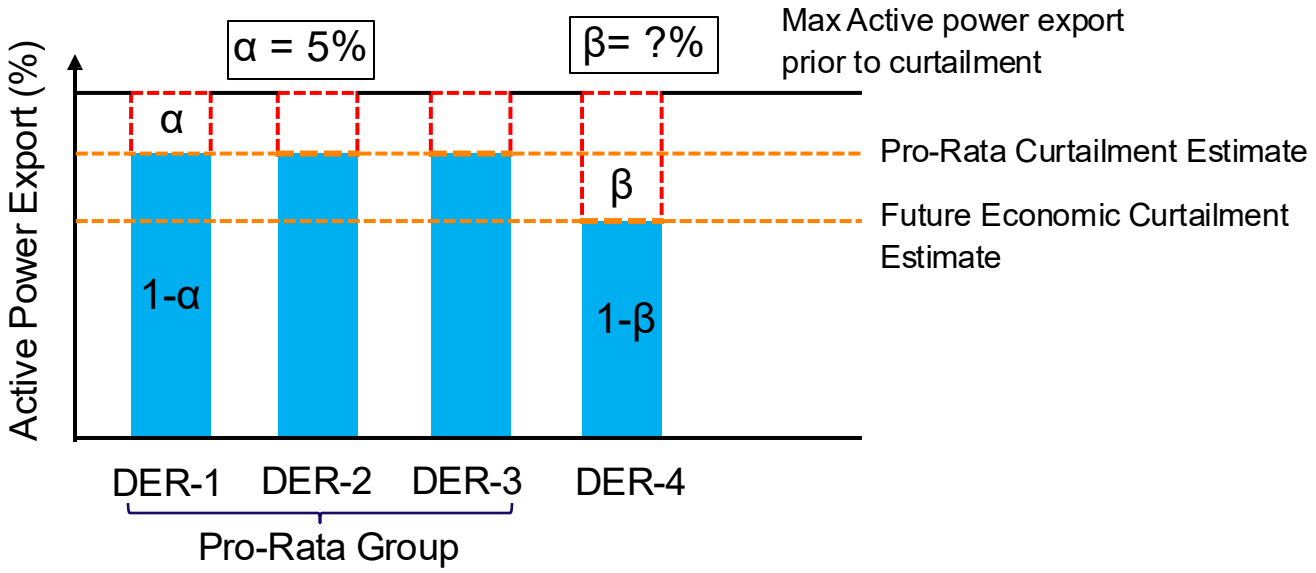
Pros

- Encourages more participation since no individual DER is disproportionately affected
- Unlocks the most capacity and allows for most efficient use of grid assets

Cons

- Curtailment risk/uncertainty is significant because the curtailment can increase as more flexible capacity is added
- Can be more difficult to trace curtailment than LIFO but still a demonstrated approach

HYBRID



Pros

- Encourages more participation since no individual DER is disproportionately affected and saves initial DERs from over dilution of their energy
- Leaves room open for more DERs and provides financial certainty to all DERs

Cons

- Can be harder to implement technologically

Curtailment Studies & Reports

Objective: Develop standardized data inputs/outputs and template for studies while considering financing needs

1. Can standardized inputs and outputs be developed for the EDCs to more efficiently develop curtailment studies? What are the pros and cons?
    1. What are the key inputs we want to standardize?
        1. Customer operation (e.g. charge and discharge)
        2. EDCs (e.g load profiles, planning criteria, flexibility planning assumptions)
2. What data can be shared within the report to support the financing process?
    1. How does this vary depending on the type of DER resource?

Curtailment Risk Management & Financing

Objective: Develop strategies for developers to be able to successfully finance Flex IX projects

1. What is the viability of curtailment guarantees? Is it possible to provide some form of guarantees without ratepayers paying for it?
2. What are alternative approaches to curtailment guarantees that can increase certainty of curtailment targets and provide confidence to financiers?
    1. Include criteria for triggering curtailment and probability of triggers occuring
3. What are the criteria for triggering curtailment and what is the probability of those triggers occurring? (e.g thermal, voltage etc.)
    1. Scenario analysis as it relates to risk factors
4. How will financing terms change with and without guarantees?
5. What have other jurisdictions decided?

Topic 2:
Interconnection Rules

Interconnection Process

Objective: Determine whether Flex IX can be integrated into existing process vs. needing new process

1. Can the existing interconnection process be leveraged to implement Flex IX without requiring significant modifications and DPU approvals?
2. Are there steps in the standard interconnection process that kickoff the Flex IX consideration process?
3. If so, can this step serve as a short-term or long-term solution? (e.g waiver)
4. If not (or steps only serve as short-term solutions), how should the broader process be modified to implement flex IX?
5. Are additional fees necessary to participate in flex IX? If so, what should fees be charged for and how much?
6. How would re-studies be incorporated into the queue?
7. What have other jurisdictions decided?

Queue Management

Objective: Determine who will be offered Flex IX within existing queue vs. new queues'

1. How will flex IX offered to the queue?
    1. How does this change in regards to ITC timelines?
2. What have other jurisdictions decided?

Interconnection Agreement

Objective: Develop standardized template & terms for Flex IX agreement

1. What key aspects of the programmatic topics should be included in the agreement?
2. How does the curtailment study and the results get incorporated into the agreement if at all?
3. What can be incorporated into the agreement to improve financing certainty?
4. What have other jurisdictions decided?

Topic 3:
Technical & Operational Requirements

Technical Standards & Guidance

Objective: Develop standardized documents outlining technical architecture, utility side equipment, customer site design requirements and backup/failure strategies.

1. What customer site design and technical requirements should be included?
    1. Communications design criteria (cellular, fiber etc.)
2. Should utility side equipment and DERMS architecture information be included?
3. Should this include guidance to address backup/communications failure strategies? If not, where should this be provided?
4. What have other jurisdictions decided?

Curtailment Notification & Reporting

Objective: Develop standardized approach for site operators will be notified of and receive data on curtailment

1. Should DER sites be notified in real-time or near real-time when individual curtailment events occur? What are the pros and cons?
2. Should DER sites receive regular reporting on the annual MWh curtailed to date? If so, what should the frequency be?
3. What have other jurisdictions decided?

Site Cost Estimates

Objective: Develop standardized cost estimates for customer site requirements

1. What are the cost estimates for customer side requirements? Can these feasibly be developed?
2. Where should cost estimates be included? Should this be included in the technical guidance documents?
3. What have other jurisdictions decided?

Topic 4:
Program/Offering Launch

DERMS Rollout & Substation Prioritization

Objective: Develop process for rolling out DERMS and prioritizing substations

1. How should DERMS be rolled and made available for flex IX? (e.g iterative, station based rollout)
2. What criteria should be used to prioritize substations?
    1. Polling developers on ideal locations
3. What have other jurisdictions decided?

Substation Capacity Calculation

Objective: Develop standardized methodology to calculate substation flex IX capacity

1. What is the methodology by which substation flex IX capacity can be calculated?
2. Does this methodology vary depending on the configuration of the system? (e.g radial, networked etc.)
3. Can the true flex IX capacity be calculated upfront or is it an estimate?
4. Can these estimates be shared upfront or be notified depending on where you are located? Can this be shared publicly and through what forums? (e.g hosting capacity maps)
5. What have other jurisdictions decided?

Program Launch & Communication

Objective: Develop strategy for official launch of program and communication of information

1. How will program details be socialized with stakeholders? (i.e workshops, public page etc.)
2. How will substations and capacity be announced?
3. How will the EDCs communicate with and offer flex IX at substations?
4. What have other jurisdictions decided?

Topic 5:
Other Topics

ISO-NE ASO Studies

Objective: Develop process for DERs under flex IX to be studied under ASO studies

1. What inputs/assumptions should be used by ISO-NE to study DER facilities under flex IX?
2. Can flex IX be used to mitigate transmission constraints or eliminate the need for a study?
3. What other aspects of flex IX should be considered by ISO-NE?
4. What have other jurisdictions decided?

Post-upgrade Paradigm & Free Ridership

Objective: Develop process for how Flex IX facilities are treated once an upgrade is necessary

1. If an upgrade occurs after Flex IX DERs are interconnected, will they be curtailed less until new constraints are reached?
2. If DERs beyond what can be interconnected under Flex IX wish to pay for an upgrade, should Flex IX DERs contribute to the upgrade?
3. If not, is there any incentive for Flex IX DERs to contribute to the upgrade?
4. Is there a free ridership issue if Flex IX DERs do not contribute to the upgrade but benefit (at least temporarily) from less curtailment?
5. Is this an issue that needs to be solved immediately to launch flex IX programs?
6. What have other jurisdictions decided?

DER Size Eligibility

Objective: Determine which sizes of DERs should be eligible for flex IX

1. What sizes of DERs should be eligible for dynamic flex IX?
2. Are there specific sizes that should be prioritized for the first iteration of the program?
3. What have other jurisdictions decided?

Key Programmatic Topic & Open Questions

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Workshop Planning

Workshop Planning

1. Next month or so will go into workshop planning:
    1. Develop attendee list and seek feedback from subgroup
    2. Determine in-person logistics (rooms etc.) and send out calendar block
    3. Develop draft detailed agenda & playbook to circulate to subgroup
    4. Develop facilitation strategy (methods to develop consensus)
2. Should the workshops be in-person or virtual?
    1. Virtual could start with setting the stage* -> be prepared to come to inperson session with x, y and z to hit the ground running
    2. In-person for actual working sessions for more complex issues
    3. Virtual for less complex issues
3. How many days is required for workshop? (e.g 2 days, 3 days etc.)
4. What weeks are best to hold workshop? How many weeks notice should be provided to stakeholders?
    1. Week of 12/8
    2. Week of 12/15
    3. Jan 2026*

Thank You!