Interconnection Implementation Review Group (IIRG) Flexible Interconnection Workshop

MARCH 3-4, 2026 – DAY 2

GridLAB

ADVANCED ENERGY UNITED™

RMI

charged

Charting a path for Greater Electrification on the Distribution system

Workshop Objectives

- Objectives
  - Build shared understanding of how different DER flexible interconnection offerings work within the existing electric power system (EPS)
  - Discuss and solicit feedback on the implementation of a ***Dynamic Flexible Interconnection offering via a Distributed Energy Resource Management System (DERMS)***
- Out of scope (Addressed in subsequent phases)
  - Flexible Interconnection in the context of the Long-term System Planning Process (LTSPP)
  - Flexible Interconnection for electric vehicles (EVs) and electric vehicle supply equipment (EVSE)

Agenda – Day 2

9:00 - 9:15 Welcome & Recap

9:15 – 10:00 Session 7: IX Management Breakout

10:00 - 10:45 Session 8: IX Agreement

10:45 – 11:00 Break

11:00 – 12:00 Session 9: Financing Breakout

12:00 –12:45 Lunch

12:45 – 1:40 Session 10: Technical & Operational Requirements + Breakout Session

1:40 - 2:40 Session 11: Implementation Process + Breakout Session

2:40 - 2:50 Break

2:50 - 3:20 Session 12: Technology Specific Considerations

3:20 - 3:50 Session 13: Tariff & Regulatory Approval

3:50 – 4:15 Review bike rack

4:15 - 4:30 Close Out

Ground Rules

Be present

- Refrain from using laptops, phones, tablets during activities

Consider new possibilities

- Park assumptions and engage constructively

Take space, make space

Keep confidences

- Modified Chatham house rules: you can say what was said, who was here, but not who said what

“Bike Rack”

Place to identify topics we want to discuss that are not necessarily in scope for our numbered session

We will plan to cover bike rack topics at the end of day 2

Check-in

After a night's sleep, what is becoming clearer to you?

Interconnection Process Discussion

In **new** breakout groups, introduce yourselves and fill out the worksheet at your tables together.

Once you have completed the scenarios together, discuss the following:

1. Are the interconnection scenarios the correct ones?
2. What other scenarios should potentially be considered?
3. Looking at the process diagram, what new work flows may need to be added?

Interconnection Scenarios

The IIRG identified three scenarios in which Dynamic Flex IX could be offered:

1. Existing projects in queue that were already studied for firm interconnection and/or upgrades

- Restudies anticipated

2. New projects that seek to interconnect after firm limits are reached

3. Existing projects seeking a bridge to wires solution while waiting for an upgrade

- Could also be considered as upgrade timelines are being monitored to receive ITC

Session 8: Flex IX Interconnection Service Agreement

Dynamic Flex IX Agreement – National Grid

- Actively managed connections use an Operating Agreement requiring dynamic import/export limits and curtailment compliance
- Flex Operating Agreement supplements (not replace) the tariff-defined ISA, which remains the governing interconnection agreement.
  - ISA and Flex Agreements are contractually linked and jointly enforceable, covering control, communications, and curtailment
- Curtailment target: 5% annual energy (MWh) curtailment (aka 95% availability) during scheduled hours
  - Higher curtailment tiers (e.g., 10% or 20%) may be offered if 5% is not feasible.
  - Scheduled Hours are standardized for use only to estimate curtailment targets

BESS Season/Operation	Charging (Import) Hours	Discharging (Export) Hours
Spring (03/01-05/14)	11PM-5PM	5PM-11PM
Summer (05/15-09/14)	11PM-3PM	3PM-11PM
Fall (09/15-11/30)	11PM-4PM	4PM-11PM
Winter (12/01-02/28)	11PM-3PM	3PM-11PM

Table 5: Charging and Discharging Time Blocks

- Additional protection included in study – evaluating at 75% EPS limit
- Curtailment tracking is estimated, non-binding, and measured hourly

Questions?

Interconnection Agreement Discussion

Return to your breakout groups and discuss the following questions:

When looking at National Grid's Flex IX ISA (i.e separate attachment to ISA):

1. When looking at National Grid's Flex IX ISA (i.e separate attachment to ISA):
   a) What works well?
   b) What presents a challenge and should be refined?

2. What additional information could be provided as a part of an IX agreement to support project development and financing?

3. What modifications may need to be made to accommodate new technologies, such as standalone storage?

Break
Please return at 11:00 AM

PLEASE RETURN TO YOUR BREAKOUT GROUPS FOR THE NEXT SESSION

Session 9: Financing Breakout

Financing Discussion

In your breakout groups, introduce yourselves and discuss the following:

1. *What is needed to ensure dynamic flex offerings are viable?*

2. *What other non-curtailment cap strategies and approaches can improve project financial viability?*

3. *What additional information is needed for these non-curtailment cap strategies?*

4. *What is the viability of a curtailment cap and how would it potentially be structured?*

Lunch
Please return at
12:45 PM

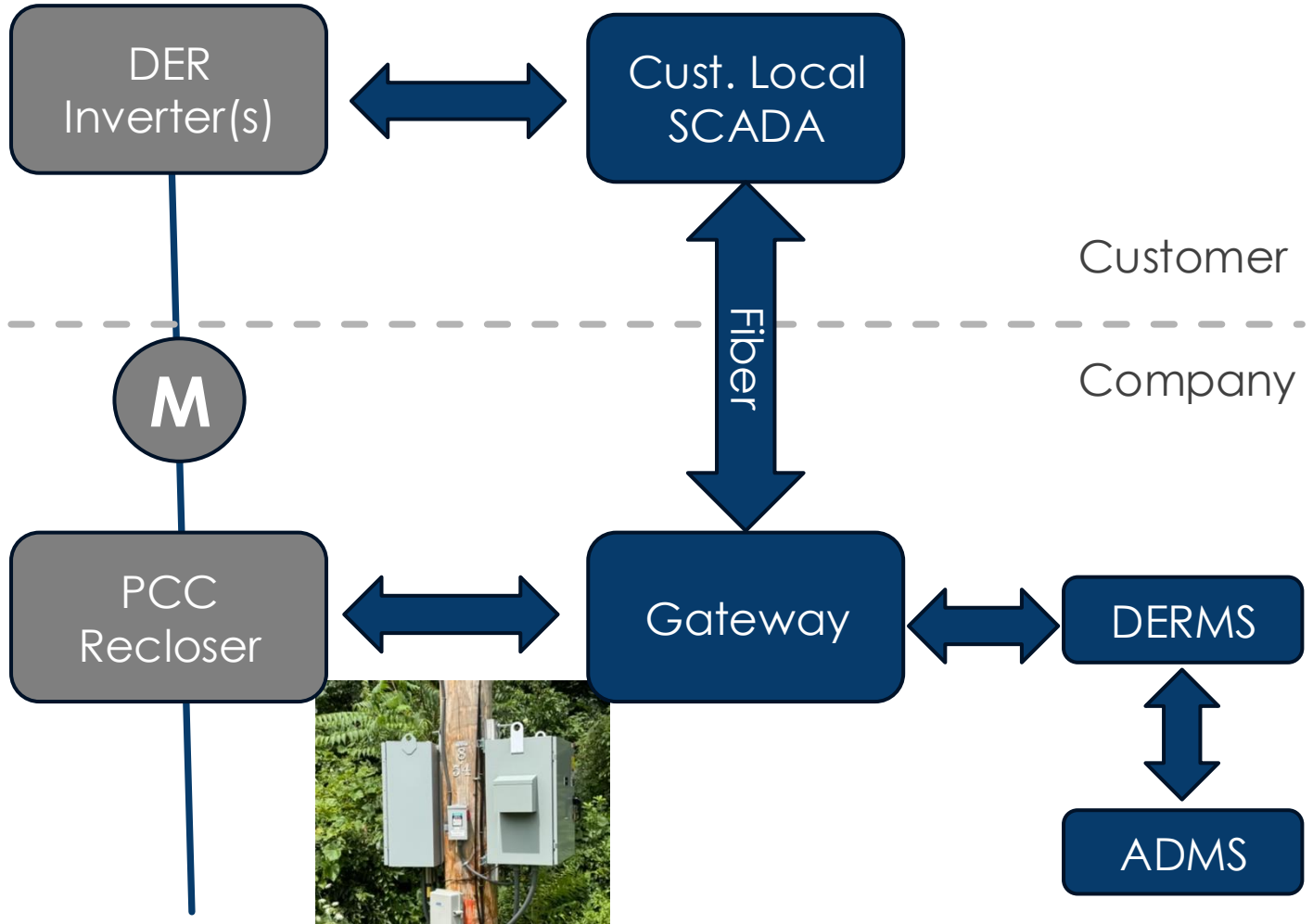
Session 10: Technical & Operational Requirements + Breakout Session

NATIONAL GRID DRAFT EQUIPMENT

Targeted Functionality:

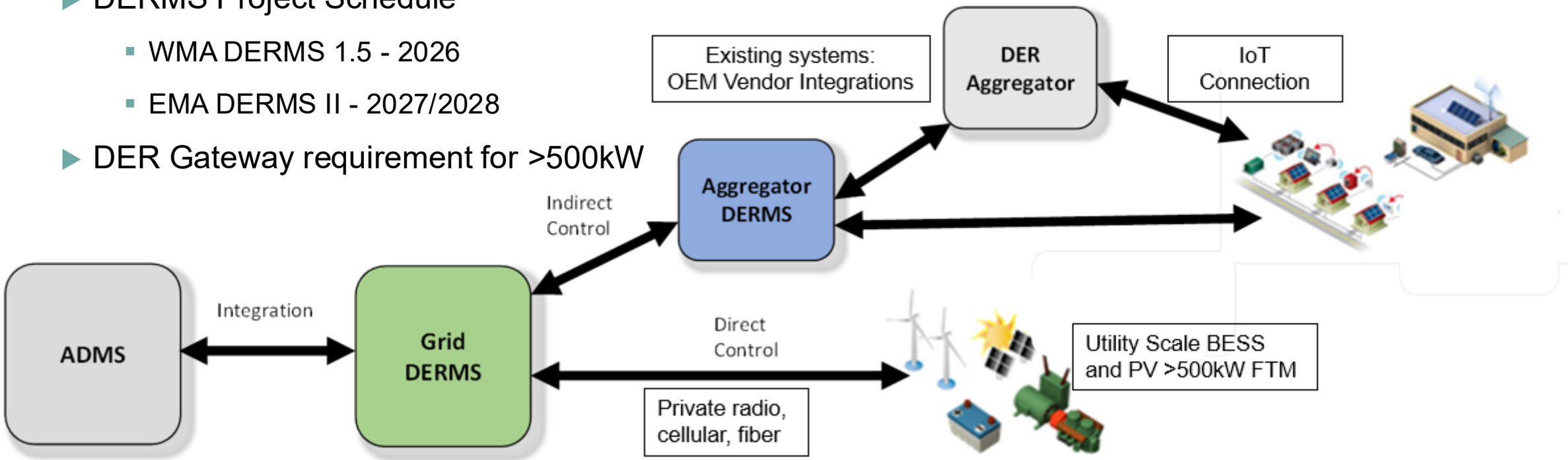
- Real-time communication of automated dispatch signals (e.g. export limits) to DG on-site controller
- Loss of communication detection between centralized utility system and DG
- Integration with Company utility PCC recloser for underperformance protection assurance
- Step towards standardizing dispatch communications and interface with DER (e.g. IEEE 1547-2018, interface documents, data needs)

This illustrative diagram represents a high level view of current understanding and learnings and is subject to change



EVERSOURCE DERMS DEPLOYMENT

- DERMS Product
  - GE Vernova (GEV) GridOS DERMS product offering
    - Integrations with Eversource existing GEV SCADA/ADMS energy control system
- DERMS Project Schedule
  - WMA DERMS 1.5 - 2026
  - EMA DERMS II - 2027/2028
- DER Gateway requirement for >500kW



Questions?

Technical & Operational Requirements Discussion

At your tables, discuss the following and write down your answers on your worksheets:

1. What options could EDCs consider to help streamline technical requirements across EDCs?

2. When would flex participants prefer to receive the technical requirements document? Is it critical to developers' financing?

3. Is there any additional information industry would like to see included in the technical guidelines?

4. Are there any aspects of the technical guidelines industry would like additional detail or clarification on?

Session 11: Implementation Process + Breakout Session

Implementation

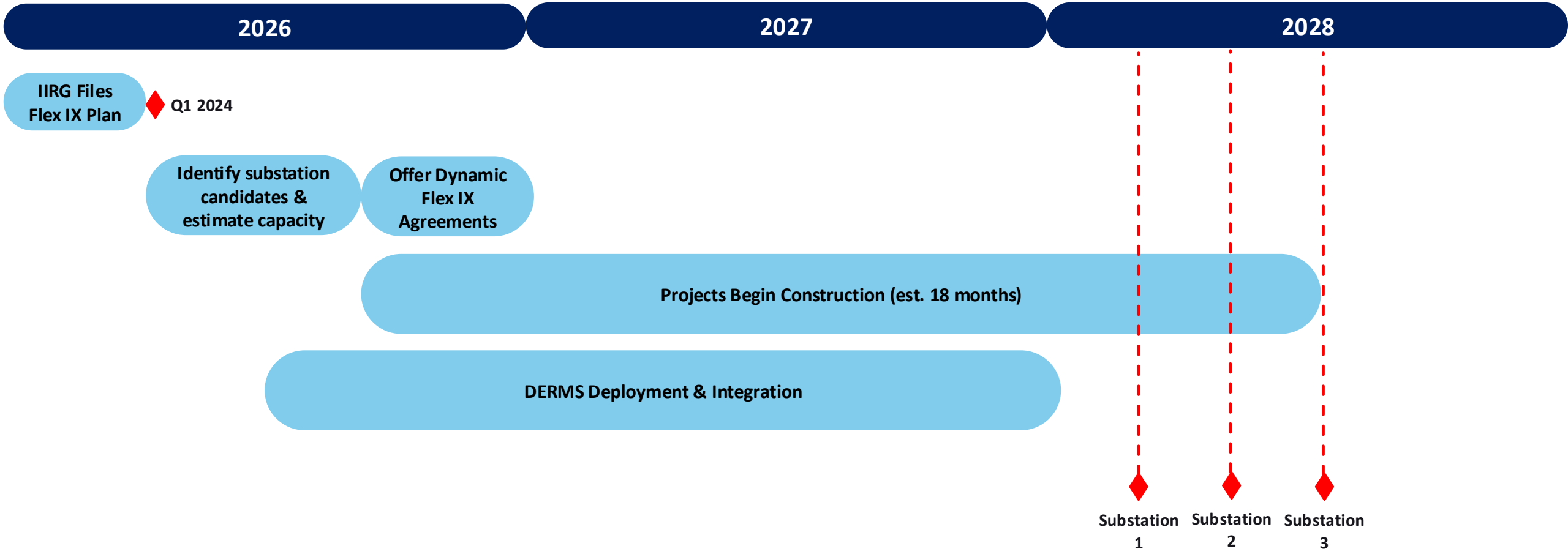
There are two key aspects to implementation:

- **Dynamic Flex IX Analysis:** Determine how and when EDCs can conduct an analysis to inform formal dynamic flex IX offerings
- **Offering Launch & Formal Dynamic Flex IX Offers:** Determine the formal process by which the offering will be launched and offered at specific locations

Dynamic Flex IX Analysis

- **EDCs in other jurisdictions have conducted a system wide assessment of dynamic flex IX potential and prioritized substations for availability**
  - National Grid NY filed a proposal for enabling Dynamic Flex IX at up to 7 substations enabling 30-60MW per substation
  - ComEd initially estimated a minimum of 240+ MW of potential and has conducted a system wide analysis to understand total dynamic flex IX potential
- **EDCs' system wide assessment have considered the following:**
  - Informed by specific prioritization criteria (developable land, existing constrained locations, length/quality of data, communications availability etc.)
  - Inform prioritization and iterative, locational deployment of DERMS and communications
- **EDCs have conducted a Dynamic Flex IX Analysis and made dynamic flex IX offers in parallel to DERMS deployment**
  - Projects typically take 18 months to construct so offers can be made provided that DERMS is ready at specific substations within the construction timeline

Dynamic Flex IX Analysis: Example EDC Timeline



Implementation Plan Discussion (Part 1)

In your breakout groups, discuss the following and write your answers down on stickies. Label each sticky with the question #:

1. What lessons can MA EDCs take from other jurisdictions when approaching a flex IX analysis? What may need to be different in Massachusetts (scope, assumptions etc.)?

2. Can a flex IX analysis be used to support the ITC and safe harboring? If so, would this be different from an analysis used to make offers?

3. How and when might a flex IX analysis need to be updated as DERMS is deployed?

4. Is it viable to conduct a flex IX analysis and make formal offers in parallel to DERMS deployment?

Implementation Plan Discussion (Part 2)

In your breakout groups, discuss the following:

1. How should the formal launch of a dynamic flex IX offering be communicated? Where should this information be made available?

2. How should the announcements or specific substations and locations for dynamic flex IX be communicated? Where should this information be made available?

3. How should formal offers to specific developers be communicated?

Break
Please return at
2:50 PM

Session 12: Standalone Storage Specific Considerations

BLUEWAVE

Standalone Storage and Flexible Interconnection

Revenue Streams

Solar

- SMART
  - Dispatch timing agnostic revenue stream
- Capacity (if paired)
- CPECs (if paired)

Standalone Storage

- Wholesale markets
  - Energy arbitrage
  - Capacity
  - Ancillary services
- CPECs

Two Key Differences

Added dimension of curtailment (i.e., charging) for standalone storage

Revenues vary greatly by hour or even minute

- Loss of a single high-priced hour can be a significant portion of project revenue

Solar Curtailment Considerations

Revenue impact

Every MWh curtailed has the same impact, regardless of timing

Percentage curtailment is directly correlated to revenue impact percentage

Interconnection cost reductions

If value of interconnection cost reductions > value of lost revenue, project moves forward

Easy to calculate both values

Storage Curtailment Considerations

Revenue impact

- Every MWh has a distinct value
- Percentage curtailment is not necessarily correlated to revenue impact percentage

Cost impact

- Curtailment on charging can increase costs by shifting charging to higher priced hours

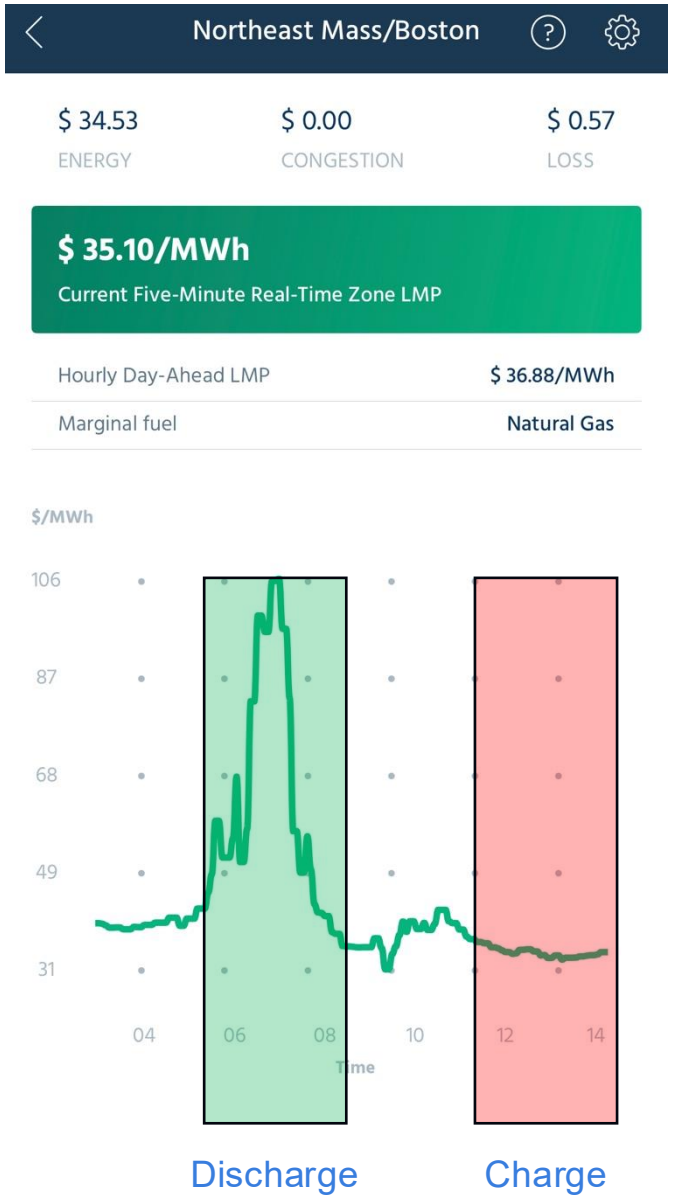
Interconnection cost reductions

If value of interconnection cost reductions > value of lost revenue and increase cost of charging, project moves forward

- Extremely difficult to calculate value of lost revenue and the increase in cost of charging if hours of curtailment are not firm
- Likely only projects that have unusually strong economics will be able to absorb the risk

Energy Arbitrage

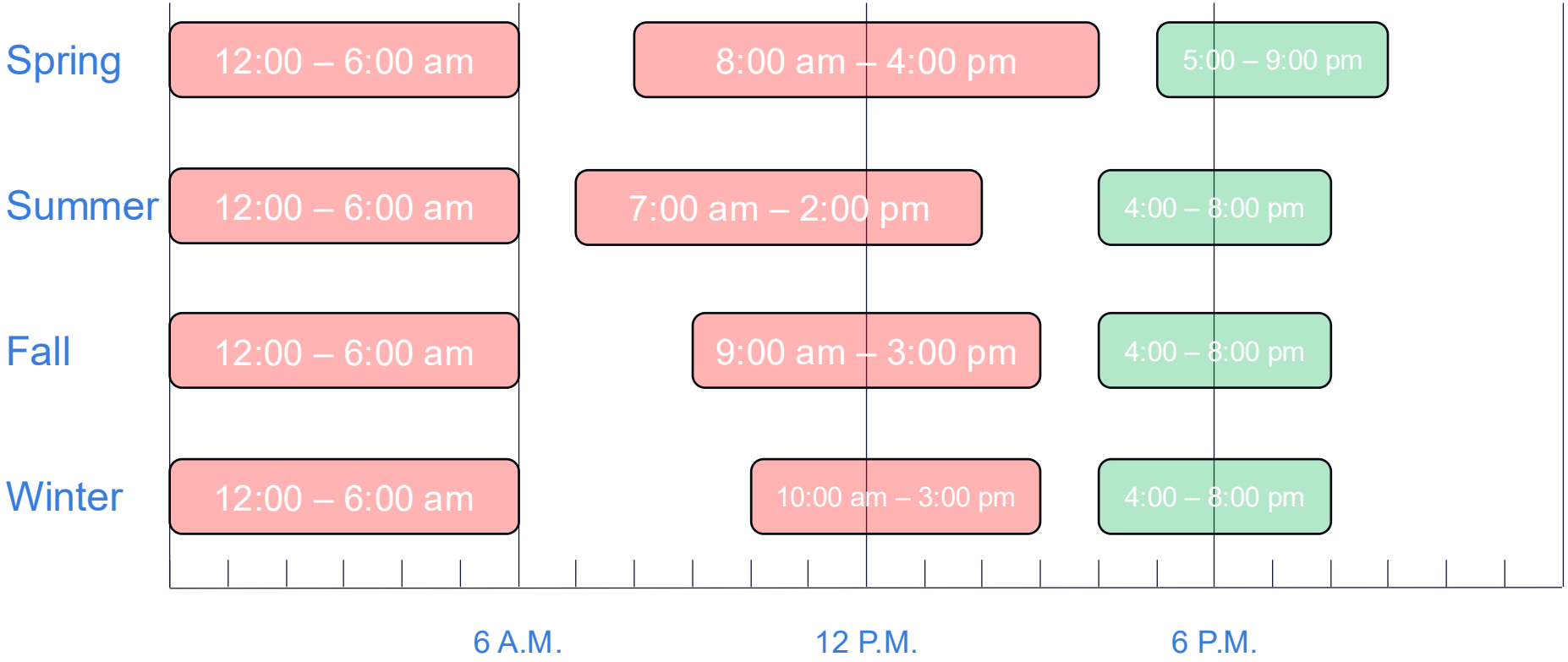
- Charge when prices are lower, discharge when prices are higher
  - Opportunities are limited in ISO NE today
- Most projects are 4-hour duration
- ESS owners will likely have to discount arbitrage revenues to account for uncertainty



Capacity

- Curtailment does not impact ability to participate in capacity markets, as these are long-term markets
- Curtailment does, however, increase risk of non-performance during capacity scarcity events
  - Creates exposure to Pay for Performance penalties
- Unlikely (though not impossible) that ESS would be export curtailed during a capacity event, however ESS could lack sufficient charge due to earlier import curtailment

Clean Peak Standard



*Monthly peak multiplier of 25x introduces additional risk into any curtailment

Takeaways

What works for solar may not work for standalone ESS

- Different revenue streams and ability to absorb curtailment risk

Initial implementation of Flex IX may not be sufficient to drive standalone ESS uptake

We should not delay implementation of Flex IX but acknowledge that either the revenue structure or the Flex IX offering needs to evolve to accommodate standalone ESS

- Potential to consider evolution of compensation structure in grid services compensation discussions

Questions?

Standalone Storage Discussion

Journal on stickies to respond to the following:

1. Can standalone storage participate in a real time or day ahead dynamic flex IX program today? If not, what are the barriers to participating?

2. What would need to be true for standalone storage to participate in flex IX?

Session 13: Tariff & Regulatory Approval

Summary on Regulatory Insights from Day 1 & 2

No tariff change needed

File exception to current agreement, tariff change later

Tariff change needed for implementation at scale

Regulatory & Tariff Discussion

1. Is regulatory approval required to move forward?

2. Is a tariff required? If so, what should be included in the tariff?

3. Is it possible to move forward while in parallel memorializing requirements in a tariff?

Session 14: Close Out & Next Steps

Close Out & Next Steps

- Consolidate & review workshop feedback + determine additional decision points
- Provide DPU Update on workshop overview, subgroup progress and estimates timelines
- Subsequent IIIRG subgroup working sessions to refine plan
- Drafting and submit Flexible Interconnection Guidelines & Implementation Plan to DPU (Date TBD)
- Contact the IIRG Flex IX Sub-group Co-chairs with any questions
  - Michael Porcaro (michael.porcaro@nationalgrid.com)
  - Sean Burke (sburke@bluewave.energy)
  - Chris Modlish (chris.modlish@mass.gov)
  - Nikhil Balakumar (nikhil@eclipseenergypartners.com)

Check-out

What next steps are you most excited to engage in?