



CHARGED and utility partnerships for flexible grid connection

ESIG 2026 SPRING TECHNICAL WORKSHOP

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The logo for GridLAB features a stylized white lightning bolt icon on the left, followed by the text 'GridLAB' in a bold, sans-serif font. The 'A' in 'LAB' is replaced by a stylized tower icon.

GridLAB

The logo for Advanced Energy United features a stylized white lightning bolt icon on the left, followed by the text 'ADVANCED ENERGY UNITED' in a bold, sans-serif font. The 'A' in 'ADVANCED' is replaced by a stylized tower icon.

ADVANCED
ENERGY UNITED™

The logo for RMI features a stylized white 'M' icon on the left, followed by the text 'RMI' in a bold, sans-serif font.

RMI

What is CHARGED?



CHARGED is a multi-stakeholder initiative led by GridLab, RMI and Advanced Energy United, designed to enable electrification of buildings and transportation that maintains system reliability and minimizes costs.

The foundational premise is that developing solutions with broad buy-in outside of formal regulatory proceedings will drive beneficial outcomes for all stakeholders.

GridCo Partners has provided technical advisory services to the CHARGED initiative; previously, the presenter was an engineer at ComEd and collaborated with the CHARGED initiative in that role.

THREE WORKSTREAMS

“Ideation”

Develop innovative solutions, crafted through generative work with diverse stakeholders.

PRIMARY FOCUS OF THIS PRESENTATION

“Implementation”

Drive implementation through project participants (e.g., utilities), testing and improving solutions.

“Education”

Promulgate educational resources to support scaled adoption in high-impact states.

Introduction & Context



What is Flexible grid connection?

- An alternative to traditional grid upgrades that allows DERs to interconnect under certain operating conditions. Flexible grid connection methods can also apply to load, but the **focus of this presentation is on power injecting DERs.**

Why Now?

- Growing penetration of DERs (solar, storage, EVs) is stressing grid limits.
- Need for faster, cost-effective interconnection options.

Policy & Regulatory Push

- Driven by clean energy targets, equity in grid access, and improved utilization of existing infrastructure.

Drivers of Flexible Grid Connection



High Grid Connection Costs

Traditional upgrades can be expensive.



Time consuming upgrades and interconnection

Long lead times: DER projects impacted by long interconnection queues



DER Growth

Proliferation of distributed solar, battery storage, and EVs creates urgency.



Grid Constraints

Thermal limits, voltage issues, and backfeed risks.



Regulatory & Market Incentives

Time-bound targets, hosting capacity improvements, and queue management pressures.

Flexible Grid Connection Solutions



Passive Management

- Fixed rules (e.g., permanent export limits, fixed curtailment windows).
- Lower complexity but less efficient.



Active Management

- Real-time signals for control (e.g., voltage, load conditions).
- Higher DER hosting capacity and operational efficiency.

FEATURE	PASSIVE	ACTIVE
Cost	Lower upfront	Higher (tech required)
Efficiency	Lower	Higher
Responsiveness	More rigid	More adaptive
Integration Level	Limited	Deep (requires DERMS)



Dynamic flexible grid connection Illinois example and CHARGED workshop



Dynamic Hosting Capacity through DERMS Enabled Flexible Grid Connection



DYNAMIC HOSTING CAPACITY is the amount of DER MW that can be injected into the grid by actively managing DERs in real-time to mitigate adverse system impacts caused by the DER



FLEXIBLE GRID CONNECTION are DER control options to manage system constraints that would otherwise require system upgrades to interconnect DER due to system impacts caused by the DER



ENABLING DYNAMIC HOSTING CAPACITY AND FLEXIBLE GRID CONNECTION DER Management System (DERMS) - Technology that monitors system constraints in real-time and manages the output of connected DER to avoid adverse system impacts

Scaling Flexible Grid Connection // Solutions and Regulatory Considerations



DYNAMIC HOSTING CAPACITY THROUGH DERMS ENABLED FLEXIBLE GRID CONNECTION

ACTIVE MANAGEMENT



- Real-time signals for control
- Higher DER hosting capacity and operational efficiency

01



- Maximizes hosting capacity
- Optimizes grid operations

02



- Communication infrastructure
- Complex integration

03



- High DER areas
- Future-ready grids with DERMS

04



- Cost: Higher
- Efficiency – Higher
- Responsiveness – Adaptive
- Integration Level – Require DERMS

05

PASSIVE MANAGEMENT



- Fixed rules
- Lower complexity but less efficient



- Scheduled based
- Low-cost
- Easy to implement



- Inefficient use of capacity
- Not responsive to real-time conditions



- Low DER penetration areas
- Limited visibility



- Cost: Low Upfront
- Efficiency – Lower
- Responsiveness – Rigid
- Integration Level – Limited

Push from Stakeholders for Passive Management is high, citing affordability. However, Active Management serves greater balance between grid reliability and customer benefits.

KEY BARRIERS TO FLEXIBLE GRID CONNECTION

	TECHNICAL	PROCESS	FINANCE
UTILITY	Communication & Control	Communication & Control	Require Capital and O&M
	Cybersecurity	DERMS Interconnect Agreement	Tariffs
	Field Demonstration		
DEVELOPER	Site-design Requirements	Application Process	Guarantee not to exceed Curtailment
	Forecast Curtailment	Queue Management	Project Financing
	Curtailment Methodology	DERMS Interconnect Agreement	
REGULATOR	Updating IC Rules	DER Export Tariff	Rules on Payment
	Industry Standards	Grid Service Compensation	

Scaling Flexible Grid Connection // DERMS and Active Mgmt. Overview



FLEX GC STRUCTURES:
BRIDGE TO WIRES VS.
PERMANENT FLEX GC

○ TEMPORARY FLEX GC UNTIL GRID UPGRADES

- No incentives needed
- Proven at scale
- Quick to implement
- Prioritized for near-term capacity enablement

○ PERMANENT FLEX GC

- Ongoing operational flexibility in lieu of upgrades
- Incentives required
- No large-scale DER demo
- Further study after Bridge to Wires is established

SUMMARY AND KEY TAKEAWAYS

DERMS for *effective* flexible interconnections *management*

Bridge to Wires first for **fast, low-cost** DER integration

Permanent Flex GC requires *incentive design* and research

FEATURES	BRIDGE TO WIRES	PERMANENT FLEX GC
Duration	Temporary	Ongoing
Incentives Required	No	Yes
Implementation Scale	Proven to Scale	Limited to Pilots
DER Developer Appeal	High	Conditional
Priority	High	Medium

CHARGED facilitated workshop outcomes



► Key challenges discussed with stakeholders:

- DERMS Curtailment Methods
- DERMS Technology and Operations
- DERMS Curtailment Allocation
- Curtailment certainty needed for Financing
- Customer side requirements to comply with DERMS technology

While the previous CHARGED workshop was focused largely on supporting flexible grid connection for distribution solar, Future CHARGED engagements with the utility will focus more specifically on supporting load.

► Outcomes based on the CHARGED facilitated process:

- Curtailment Method finalized – Pro-Rata
- Technology still evolving but its there for Thermal overload use case. Stakeholders feel confident with the demonstration.
- 5% curtailment pro-rata bucket then LIFO
- More data provides proxy for curtailment certainty.
- Technical documents required for developers to comply with requirements.



Dynamic flexible grid connection for Massachusetts

CHARGED
Workshop



MA workshop on Flexible Grid Connection and DERMS



- CHARGED led a workshop in March 2026 with all MA stakeholders to launch the Flexible GC program.
- MA is at capacity for DER installations and Flexible GC is the only solution to obtain safe harbor benefits for obtaining ITC credits.
- We covered a variety of topics that stakeholders needed to formalize in order to move forward.

1

Purpose & Scope

Flexible interconnection context & framework goals.
Solar + Storage and Standalone Storage

2

Analytical Foundation

Data inputs, constraint checks & overall study workflow.

3

Curtailement Methodology

Approach used to estimate DER curtailment

4

Scenario Analysis

Case study, and battery storage impact

5

Planning Context

N-1 considerations and how risk is reflected in planning criteria.

6

Flexibility-First Framework

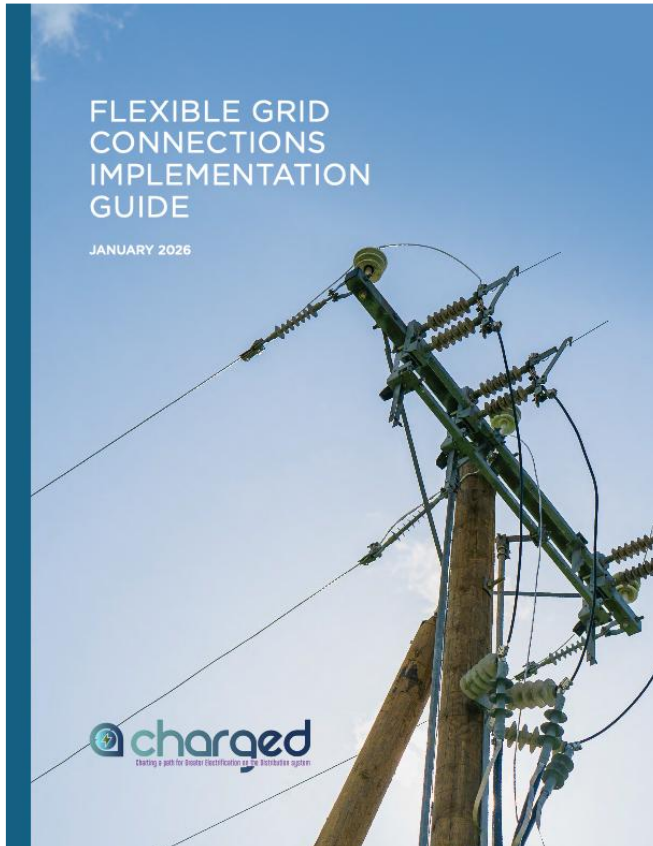
Practical recommendations for stakeholders.



Charged Flexible Grid Connection Implementation Guide



Flexible Grid Connection Implementation Guide



- Developed by CHARGED through a collaborative working group with industry experts across the country (including 6 utilities, technology providers, public interest groups)
- The guide presents implementation guidance for utilities, regulators and other stakeholders
- Describes a stepwise process for different types of flexible grid connections, taking the use cases into account
- Working group organizations included Ameren, Con Edison, Energy Innovation, Ford, Holy Cross Energy, IREC, La Plata Electric Association, LBNL, Mobility House, Prologis, SEPA, SMUD, Vote Solar, Xcel Energy



**Download at chargedinitiative.org/resources
or chargedinitiative.org/wp-content/uploads/2026/01/CHARGED-Flexible-Grid-Connections-Implementation-Guide.pdf**

 GridCo Partners

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