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Scaling 3rd Party Front-of-the-Meter Energy Storage Resources (ESR) for Value Stacking

Presentation to DOE Electricity Advisory Committee – Oct 18, 2018

Disclaimer

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GI Energy and Shell Energy North America (US), L.P.

GI Energy joined the Royal Dutch Shell family of companies when it became an affiliate of Shell New Energies US LLC in January 2018.

Shell Energy North America (US), L.P. (SENA) is an indirect subsidiary of Royal Dutch Shell, and has authorization from FERC to sell electricity at market-based rates. It is an active participant in the US natural gas, electricity, emissions and renewable markets, and competitive wholesale power markets.

SENA's commercial activities in the electric markets include full service to electric utilities, natural gas and electric supply for retail suppliers and a variety of services and products for electric generators, such as natural gas supply, energy & asset management transactions and tolling arrangements with up to 20-year terms.

GI Energy will work with SENA to participate in the RTO/ISO-administered wholesale electricity markets, demonstrating the "value stacking" advantages of battery storage technologies.

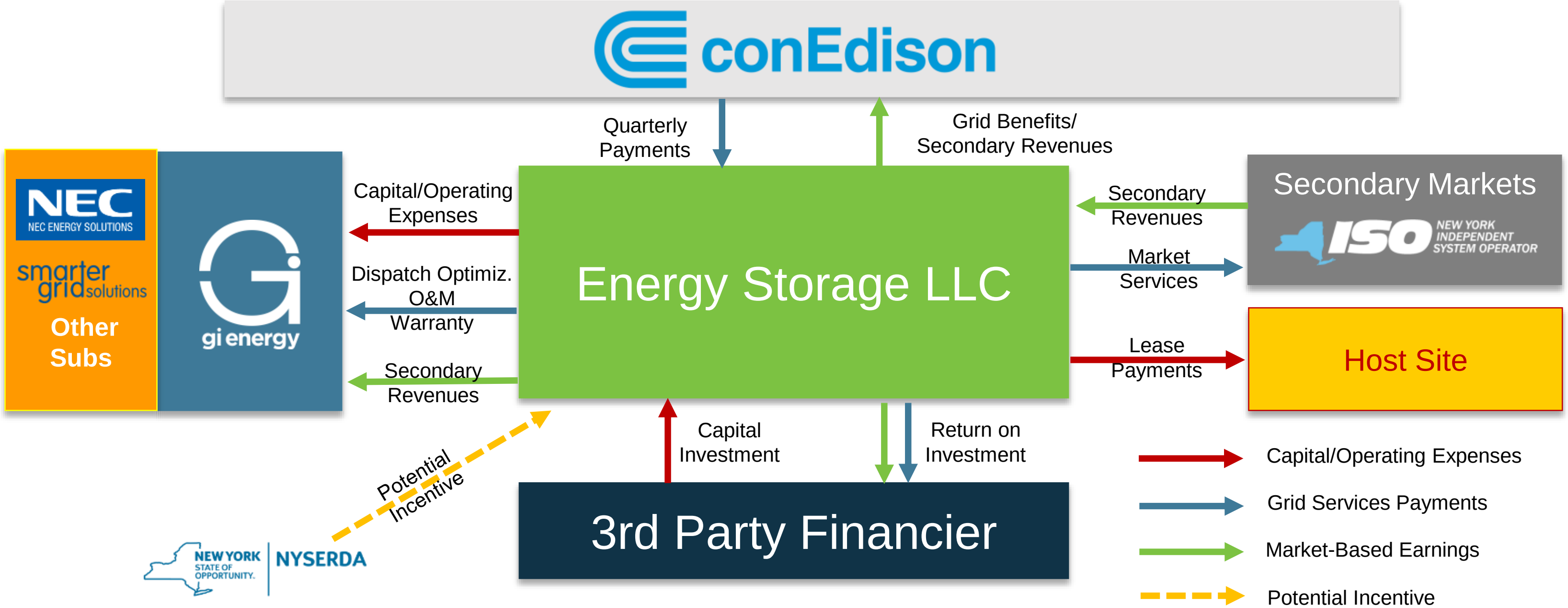
REV Demo FTM Energy Storage Services Agmt. (ESSA) Model

INNOVATIONS

- 3rd Party Owned But Entirely Utility Directed – Effectively Like a Grid Asset
- Utility-Targeted Siting & Interconnection – Storage Goes Where Grid Really Needs It
- First-of-a-kind “Dual Participation” – Con Ed + NYISO Share Use of Storage Asset
- Utility Priority Dispatch (T&D Support)
- NYISO Secondary Dispatch (Wholesale & Ancillary Services)
- New Digital Controls Platform for Secure Con Ed + NYISO Dispatch Optimization
- Utility Pays Quarterly Grid Services Fee…But Shares NYISO Secondary Revenues
- New Asset Class for NYISO – Energy Storage Resource (ESR) & ESR Aggregation
- Possible New T&D Service Classification for Utility Delivery (3rd Party-Owned Grid Asset)?

ADAPTATIONS FROM “TRADITIONAL” PPAs

- ESSA = Prototype for Storage Equivalent of PPA
- Purely Energy Transaction for Utility – But For Grid Services, Not Just Power Purchase
- Purely Real Estate Transaction for Property Owners – Think Farm Leases for Windmills
- No Host Site Energy, Operational, or Billing Impacts
- Turns Otherwise Unused/Undervalued Land into Valuable Energy Property
- Amortizes Utility’s Capital Costs Across Life of Project
- Preserves Utility Cost Recovery for Grid Support Services



NYS PSC Matter/Case: 14-00581/14-M-0101

Orientation: NYS Energy Storage Regulatory Initiatives (as of Oct 2018)

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NYS Energy Storage Rulemaking = Parallel Universes Converging

FERC-NYISO Energy Storage Rulemaking

The **federally regulated** Energy Storage Wholesale Market Design Process

FERC NOPR

FERC notifies ISOs/RTOs it's thinking about making specific rules for storage

NYISO ESR & DER

NYISO responds to NOPR & starts its own ESR Market Design and DER Roadmap processes in MIWG

FERC Orders 841 & 845

FERC reviews NOPR responses from ISOs/RTOs & officially orders rules for storage & DER

NYS Roadmap

NYISO takes part in DPS/NYSERDA Technical Conferences & PSC roadmap to reach NYS Storage Goal; prime opportunity to combine NYISO & PSC stakeholder input

FTM distribution-tied batteries fall into grey area that is just being addressed by year end 2018

NYS PSC-NYSERDA-Joint Utilities Energy Storage Rulemaking

The **state-regulated** Utility Energy Storage Roadmap Process

REV & DSIP

Gov. Cuomo & PSC notify Joint Utilities that NYS is reforming vision for utility integration of DER and storage

REV Demos, NWS RFPs & VDER

PSC & JU test new vision for DER & Storage integration via REV Demos, NWS RFPs & VDER tariffs

NYS Energy Storage Goals & Incentives

NYS launches target of 1,500 MW of storage integrated into NYS grid by 2025 & announces $350M in incentives

NYS Roadmap

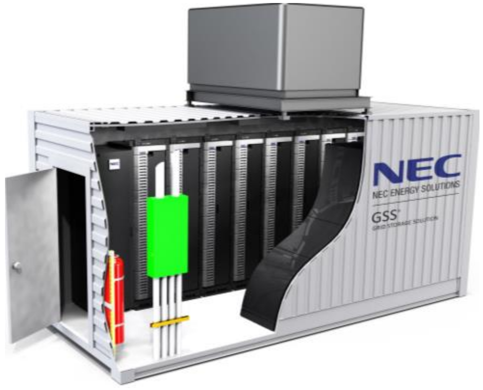
PSC asks DPS/NYSERDA to publish roadmap to reach NYS Storage Goal; DPS/NYSERDA hold Technical Conferences & NYISO takes part; prime opportunity to combine PSC & NYISO stakeholder input

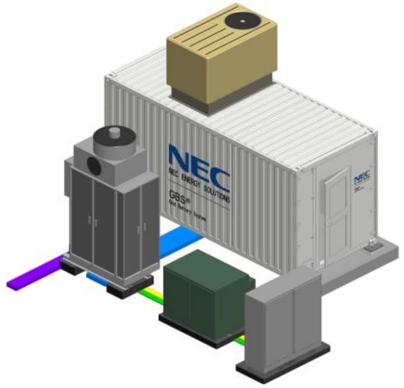
Pioneering in NYC – FTM Battery REV Demo

Project Summary

Development Activity	Status
Site Selection	Complete
Financing	Complete
Battery Procurement	Complete
CESIR	Finalizing
Construction	Q4 2018-Q1 2019
Targeted In-Service Date	Jan 31, 2019

GI Energy will have four (4) 1 MW/1 MWh nameplate 20’ NEC Li-ion GSS® modules deployed across four (4) different sites in Zone J (NYC) in 2019, all FTM and distribution-tied at Con Edison’s direction.



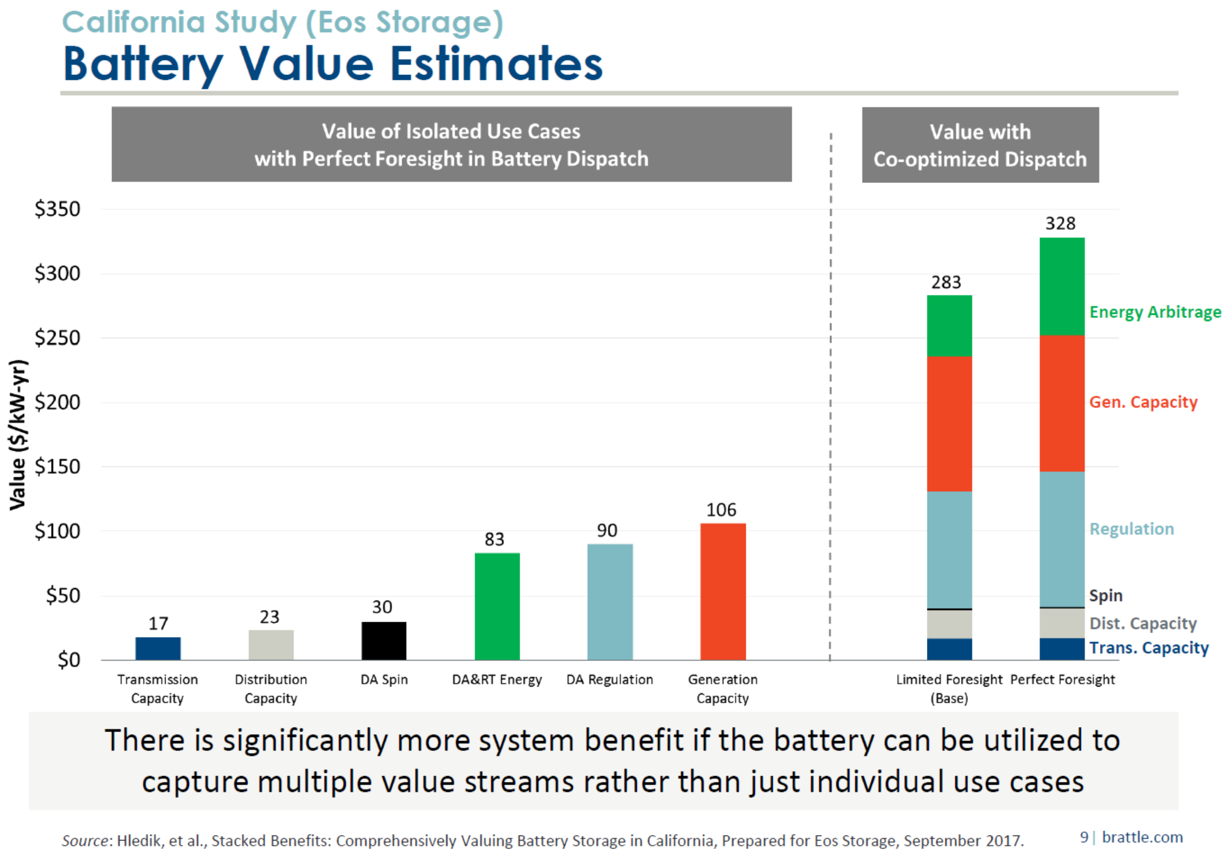


Utility + ISO "Dual Participation" – FTM Battery REV Demo

Opportunity to Showcase Actual Storage Value Stacking in NYS in 2019

GIE FTM REV Battery Project Aims to Demonstrate Value Stacking in Real World

- Test CA "Stacked Benefits" and "Value Stacking" precedents in NYS
- Test NWA+ and VDER Ratemaking proposed in NYS Storage Roadmap
- Could continue under VDER (or equivalent) after 5-year REV Demo project period



Source: Stacked Benefits: Comprehensively Valuing Battery Storage in California, Brattle Group, Sep 2017

Non-Wires Alternative Prototype – FTM Battery REV Demo

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Opportunity to Demonstrate NYS Storage Roadmap Recommendations With Actual ESRs in 2019

GIE FTM REV Battery Project Is Effectively a Ready, Real-World NWA+

- Reduce System Peak Load & Provide Wholesale Market Ancillary Services
- T&D Deferral providing greater ratepayer benefits by focusing on **full customer bill**
- Maintain interconnection for wholesale services after utility contract term
- Recognize an asset may simultaneously provide **distribution and wholesale** system needs
- Develop clear **control, coordination & dispatch** requirements

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Roadmap Recommendations

Investor-Owned Utility Roles to enable a market-based storage sector and align utility incentives and business models (continued)

- Include an **extension option** for the utility to extend an NWA contracts when an asset's life expectancy will exceed original NWA term
- Procure **NWA+ that reduce system peak load and provide wholesale market ancillary services** in addition to utility T&D deferral to provide greater ratepayer benefits by **focusing on the full customer bill**

  Sub-transmission and distribution deferral value

  + Capacity cost savings

  + Ancillary services revenues (spinning reserves, frequency regulation)
- Allow developers to maintain a project's **interconnection** for wholesale services after the NWA term if distribution services are discontinued

NEW YORK STATE OF OPPORTUNITY. | NYSERDA | Department of Public Service

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Roadmap Recommendations

Wholesale Market Actions to directly or indirectly access wholesale market values and **Distribution and Wholesale Market Coordination**

- Implement changes enabling **storage participation in capacity and ancillary services markets** in compliance with FERC Order 841; include storage as a **transmission resource in NYISO planning**
- **Remove impediments to pairing storage with bulk renewables** by re-examining how preferential treatment is applied for intermittent renewables that are partially firmed by storage
- Accelerate "**dual market participation**" by recognizing an asset may simultaneously provide distribution and wholesale system needs in the NYISO's electric storage resource participation model Order 841 compliance tariff filing
- **Exempt DERs including distribution and bulk storage from Buyer Side Mitigation**
- Expand integrated **T&D planning to include storage**
- Develop **clear control, coordination and dispatch requirements** including visibility into asset state of charge to enable greater use of DERs including energy storage in meeting system customer, distribution and wholesale system needs

NEW YORK STATE OF OPPORTUNITY. | NYSERDA | Department of Public Service

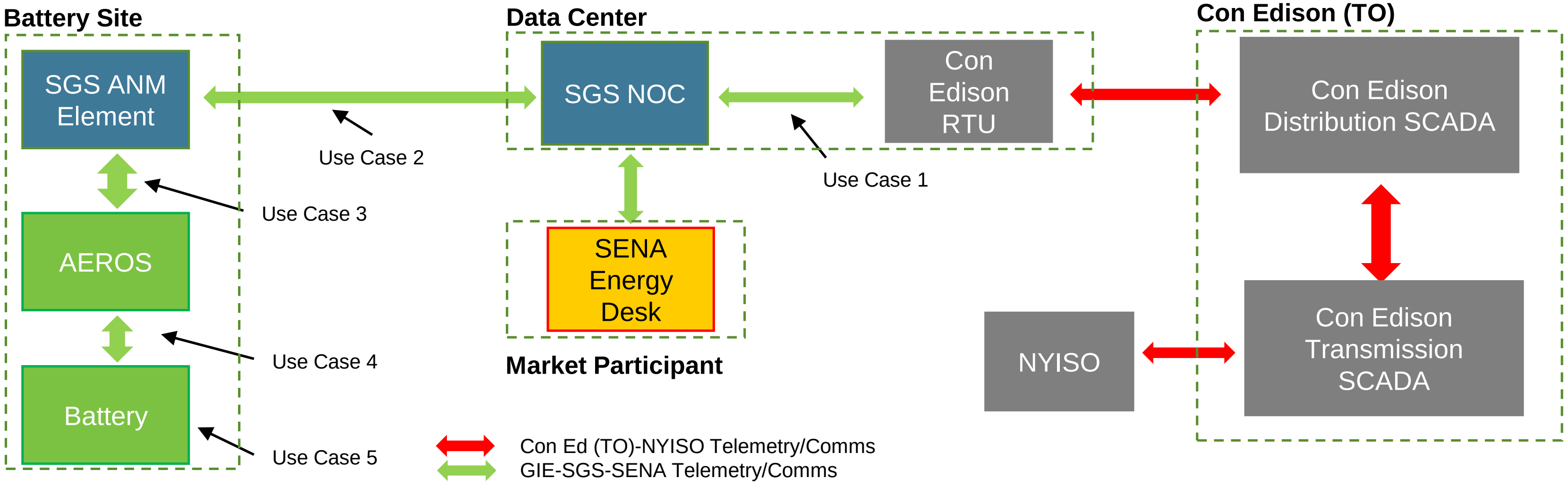
Source: NYS Energy Storage Roadmap Albany Technical Conference, NYS DPS/NYSERDA, August 21, 2018

Digitalization & Software Are Key
GIE-Smarter Grid Solutions-SENA Energy Desk HOSt™ Platform

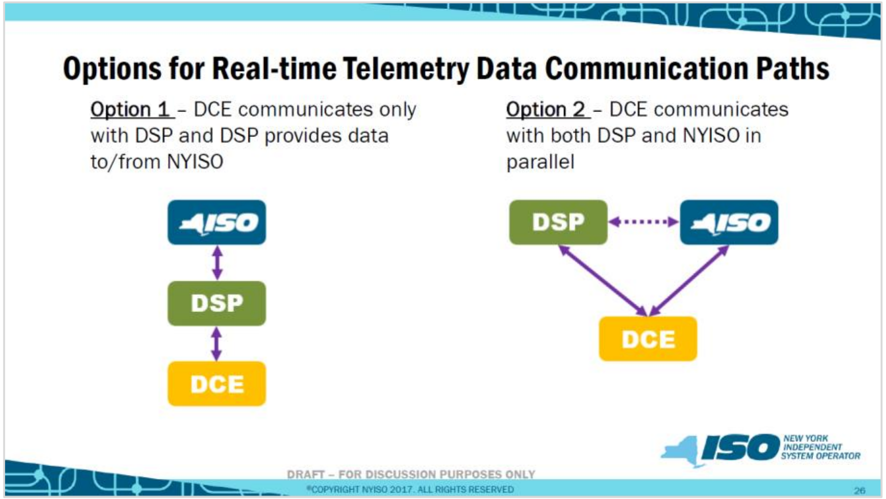
REV Demo Capable of Testing Utility + NYISO Value Stacking in 2019 (If Only Rules Allow)

- Each battery to be Self-Monitored/Self-Scheduled for DAM/RT and State-of-Charge (SoC) Management (as opposed to NYISO-Monitored/Scheduled/Managed)
- SENA Energy Desk to provide 24/7 NOC and co-optimization for NYISO market participation
- Con Ed (TO) revenue-grade telemetry and GIE-Smarter Grid Solutions-SENA HOSt™ software platform provides UI to both Con Ed and SENA Energy Desk for each battery
- Design meets all scan rate & latency requirements laid out in NYISO DER Roadmap

High-Level Architecture



In coordination with Con Edison, the GIE-Smarter Grid Solutions-SENA HOSt™ Platform has been designed for Con Ed + NYISO Value Stacking in line with the Option 1 telemetry & communications configuration presented in NYISO's December 2017 *Distributed Energy Resources Market Design Concept Proposal* (a.k.a. the "DER Roadmap").



Source: Slide 26 from NYISO DER MDCP Summary Presentation at NYISO MIWG Meeting, Dec 19, 2017

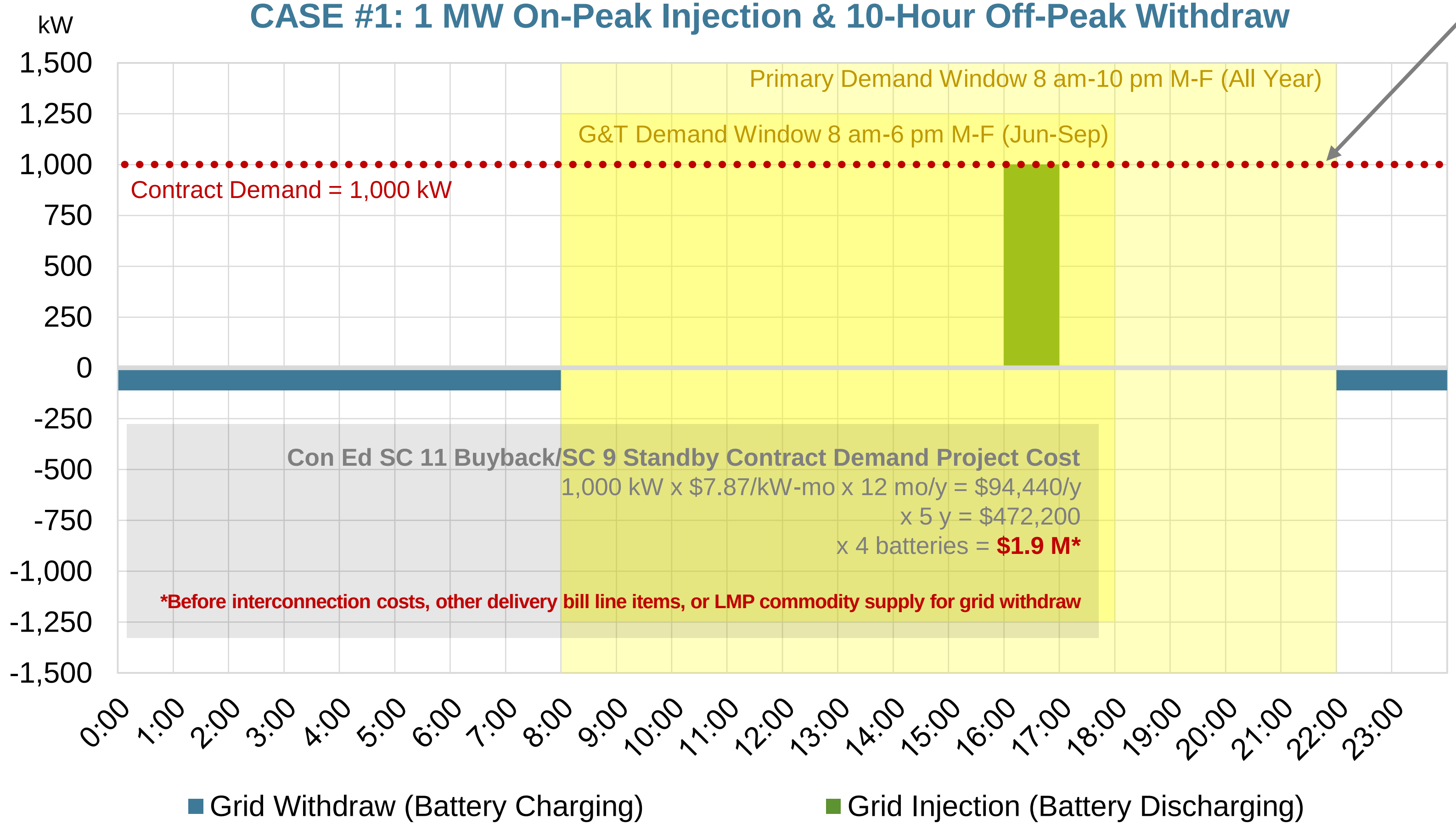
Delivery Tariffs for FTM Distribution-Tied ESRs

Delivery Billing for Utility-Owned Standalone ESRs ≠ 3rd Party Standalone ESRs

- As of October 2018, NYS Joint Utilities (apart from Con Ed) have **<u>not</u>** provided:
  - answer to "what delivery bill will our 3rd party-owned FTM battery be charged?"
  - a sample Standalone ESR delivery bill, even if given billing-grade interval data
- When asked how any of NYS Joint Utilities will bill their own Utility-Owned Standalone ESRs, answer has uniformly been: "no delivery bill; they will be treated as T&D assets"
  - Utility-Owned Standalone ESRs treated as true FTM "grid assets"
  - 3rd party-owned Standalone ESRs turned back into retail BTM accounts under Buy-Back/Standby rates
- Not a level playing field at present
  - 3rd Party-Owned Standalone ESRs subjected to $MM delivery bills when serving exact same purposes as Utility-Owned Standalone ESRs subjected to none
  - Utilities in position to take advantage of undefined tariffs
    - Currently no cap on Utility-Owned Standalone ESRs in NYS
    - REV Demo & NWA bidders either not aware of Standalone ESR delivery tariffs or, if aware, may be overpricing bids (as REV Demo shows, <u>delivery bills potentially single largest Operating Expense</u>)
      - No way for Utilities to properly levelize bids
      - No way for bidders to properly gauge competitiveness

Delivery Tariff Constraint – FTM Battery REV Demo

1 MW/1 MWh Con Ed REV Demo Battery
Projected Daily Charge & Discharge Load Profile
CASE #1: 1 MW On-Peak Injection & 10-Hour Off-Peak Withdraw



As of October 2018, each battery subject to Con Ed SC 11 Buy-Back/SC 9 Standby tariff. Largest delivery billing expense—Contract Demand—can be set by peak grid injection for each "FTM" battery under current tariff.

PSC NO: 10 – Electricity
Consolidated Edison Company of New York, Inc.
Initial Effective Date: 03/01/2014
Issued in compliance with order in Case 13-E-0030 dated 02/21/2014

Leaf: 472
Revision: 3
Superseding Revision: 1

SERVICE CLASSIFICATION NO. 11 - Continued
BUY-BACK SERVICE

Common Provisions - Continued

Determination of Demand

The contract demands for high-tension service and low-tension service for the purpose of this Service Classification shall be the contract demands as specified in the Customer's request for service hereunder (expressed in kW), unless and until a higher maximum demand is created by the Customer, in which case such higher maximum demand shall become the contract demand for that month and thereafter unless and until exceeded by a still higher maximum demand, which in turn shall likewise be subject to the foregoing conditions, provided, however, that if a Customer requests and receives a reduction in the contract demand (as explained in General Rule 10.10), the demand history prior to the reduction will not be considered in determining the contract demand for subsequent months.

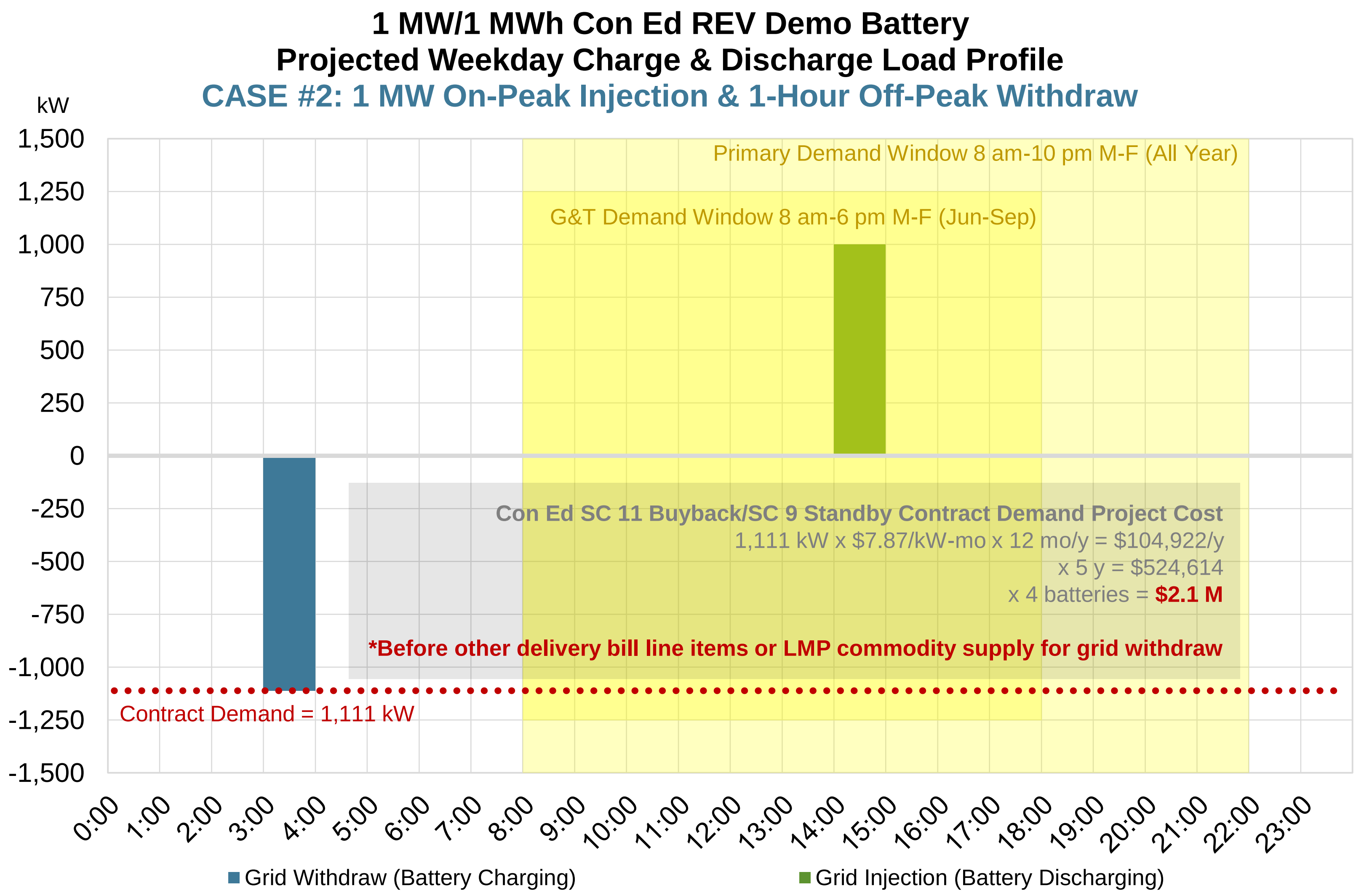
If the monthly maximum demand exceeds the contract demand by ten percent or less, a surcharge equal to twelve times the monthly contract demand rate for the excess in demand will apply to the monthly bill. If the monthly maximum demand exceeds the contract demand by more than ten percent, a surcharge equal to twenty-four times the monthly contract demand rate for the excess in demand will apply to the monthly bill.

SC 11 must be contracted for separately and will be metered separately from Standby Service (as defined under General Rule 20).

The Company will install a demand measuring device of a type approved by the Public Service Commission for the determination of maximum demand. See General Rule 10.4 for the definition of maximum demand.

Con Edison SC 11 Buy-Back "Determination of Demand" section states: "SC 11 must be contracted for separately and will be metered separately from Standby Service (as defined under General Rule 20)."

Delivery Tariff Constraint – FTM Battery REV Demo



Conventional Buy-Back/Standby Rates Limit Standalone ESR Functionality & Optimization

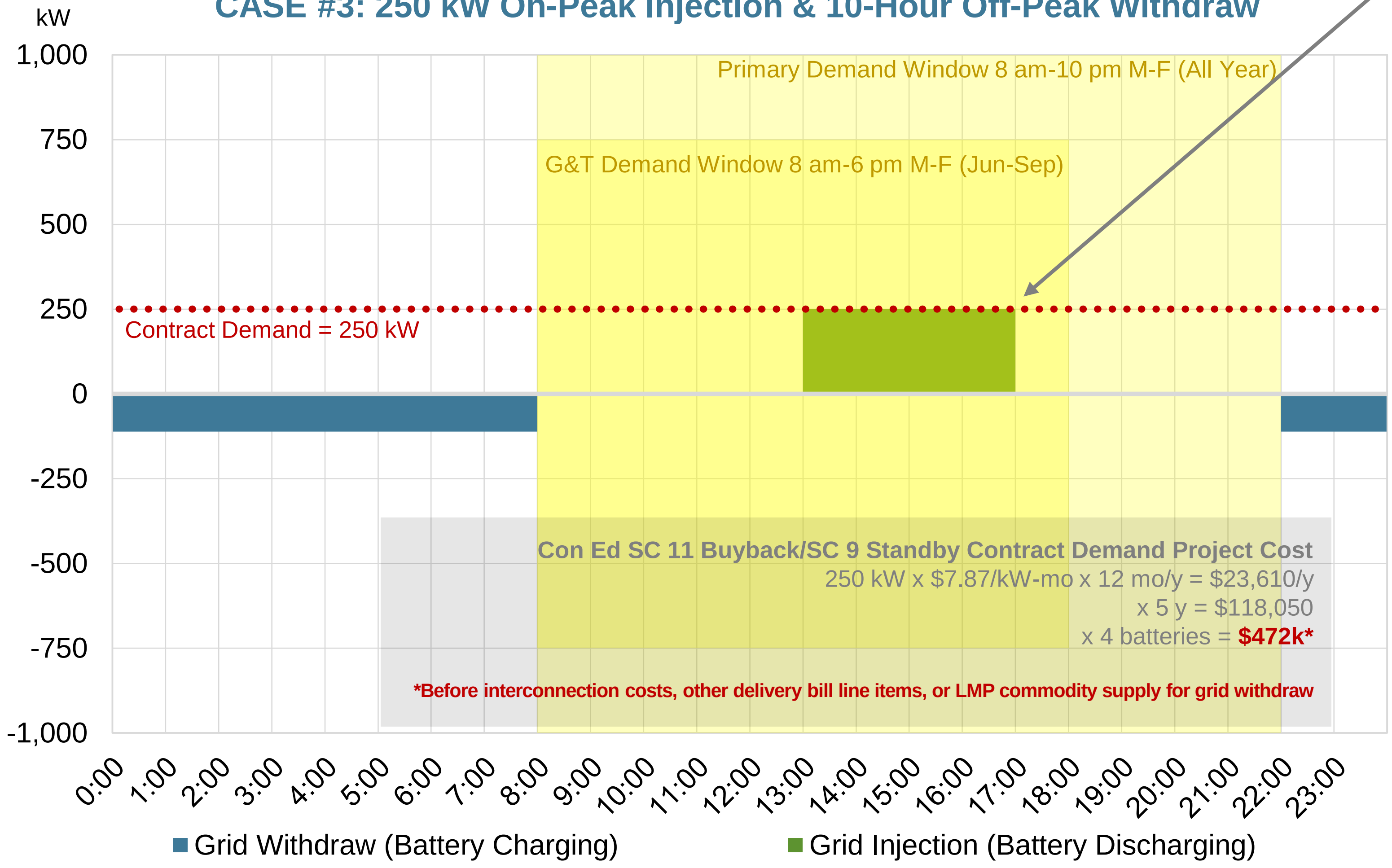
Optimizing dispatch for energy arbitrage or other grid support services may require targeting 1-hour off-peak grid withdraw (battery charging) during the lowest cost overnight period.

Due to throughput efficiency losses (10%), the total kWh required to recharge after a 1,000 kWh discharge will be approximately 1,111 kWh. If each battery were to recharge in the single most optimal hour, it would withdraw at 1,111 kW and set a slightly higher Contract Demand than anticipated. (GI Energy understands from NEC that the specified inverter and battery cells are capable of this recharge rate, as needed.)

If need be, this battery charging demand can be limited via controls by capping grid withdraw at 1,000 kW (or some other nominated kW), but this would force battery charging across multiple (off-peak) hours, thereby eliminating the capability to charge the battery in the single most optimal hour.

Delivery Tariff Constraint – FTM Battery REV Demo

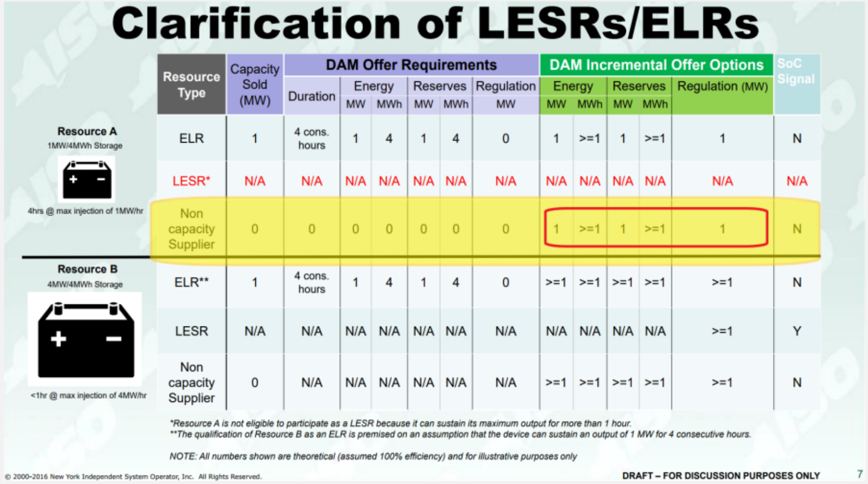
1 MW/1 MWh Con Ed REV Demo Battery
Projected Daily Charge & Discharge Load Profile
CASE #3: 250 kW On-Peak Injection & 10-Hour Off-Peak Withdraw



Delivery Bill Compromise Challenges NYISO Eligibility in 2019

Limiting grid injection to 250 kW may help reduce Con Edison delivery bill costs, notably the Contract Demand Charge, BUT...

...it makes each battery ineligible to participate as a “Non-Capacity Supplier” (effectively an ELR “Generator”) under existing NYISO Energy & Ancillary Services market rules, which require 1 MW for minimum of 1 hour and DO NOT allow aggregation at present.



Clarification of LESRs/ELRs

	Resource Type	Capacity Sold (MW)	DAM Offer Requirements						DAM Incremental Offer Options					SoC Signal
			Duration	Energy MW	Energy MWh	Reserves MW	Reserves MWh	Regulation MW	Energy MW	Energy MWh	Reserves MW	Reserves MWh	Regulation (MW)	
Resource A 1MW/4MWh Storage 4hrs @ max injection of 1MW/hr	ELR	1	4 cons. hours	1	4	1	4	0	1	>=1	1	>=1	1	N
	LESR*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Non capacity Supplier	0	0	0	0	0	0	0	1	>=1	1	>=1	1	N
Resource B 4MW/4MWh Storage <1hr @ max injection of 4MW/hr	ELR**	1	4 cons. hours	1	4	1	4	0	>=1	>=1	>=1	>=1	>=1	N
	LESR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	>=1	Y
	Non capacity Supplier	0	N/A	N/A	N/A	N/A	N/A	N/A	>=1	>=1	>=1	>=1	>=1	N

*Resource A is not eligible to participate as a LESR because it can sustain its maximum output for more than 1 hour.
**The qualification of Resource B as an ELR is premised on an assumption that the device can sustain an output of 1 MW for 4 consecutive hours.

NOTE: All numbers shown are theoretical (assumed 100% efficiency) and for illustrative purposes only

DRAFT – FOR DISCUSSION PURPOSES ONLY 7

See Slide 7 in 9/29/16 NYISO “Energy Storage Integration Market Concepts” at:
http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2016-09-29/Energy%20Storage%20Integration%20Market%20Concepts%20MIWG.pdf#page=7

Delivery Tariffs for FTM Distribution-Tied ESRs

<u>Preferred Solution</u> for Delivery Billing: Interconnection Costs + Wholesale Tariff

- FERC Order 841 opens door to Wholesale-Only Billing for Standalone ESRs (incl. REV Demo or NWA+)
- “Dual Participation” Standalone ESR projects (Utility/DSP + ISO shared dispatch) to be deemed Wholesale projects with bilateral Utility/DSP "grid services" contracts
  - Utility/DSP dispatch rights covered under a bilateral contract like GI Energy-Con Ed ESSA
  - RTO/ISO market participation covered under existing “Generator” or pending ESR rules
  - 3rd Party Standalone ESR account pays upfront interconnection costs (Utility/DSO + RTO/ISO) and wholesale-only (RTO/ISO) tariffs
- Precedent from Existing FTM Generators (incl. Pumped Storage)
  - ESRs (or any energy production system) injecting on system side of meter should be viewed just as any other production facility
  - Existing generators (e.g. ELRs, incl. pumped storage) are not charged for demand or backup service
  - Once interconnection costs are paid, Utility-Directed Standalone ESRs:
    - **do <u>not</u>** create costs that need to be recovered
    - **do <u>not</u>** take backup service from the system (or for that matter any services)
    - **<u>do</u>** provide services to the system

Delivery Tariffs for FTM Distribution-Tied ESRs

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Alternative from FERC Order 841: Wholesale Distribution Charge

- FERC Order 841 cites a PJM/ComEd case for FTM Li-ion battery interconnected on Distribution Grid by developer Energy Vault, LLC
- Wholesale Distribution Charge is a "weighted avg. carrying charge...applied on a case-by-case basis, depending on the distribution facilities expected to be used in providing wholesale distribution service."
- Sec. H.1. FERC Order 841 Sec. H. ¶ 296 & Footnote 359 "Price for Charging Energy"
  - Li-ion battery interconnected FTM on the distribution system
  - Closest FERC reference case to FTM REV Demo batteries (and like NWA-type ESRs)
- Reed Smith law firm case summary: *Getting to the Nitty-Gritty: Wholesale Distribution Rate Treatment for Energy Storage*

20180215-3100 FERC PDF (Unofficial) 02/15/2018

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to allow electric storage resources to be able to pay the wholesale LMP for their charging energy, it does not address whether they can pay some other rate, such as a retail rate or charging off of co-located generation. Finally, like other market participants that purchase energy from the RTO/ISO markets, an electric storage resource that pays the wholesale LMP for charging energy may enter into bilateral financial transactions to hedge the purchase of that energy.

295. We disagree with commenters who argue that the requirement to pay LMP for charging energy should only apply to electric storage resources that are interconnected t the transmission system. As discussed above, this Final Rule applies to electric storage resources that are capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid, irrespective of where the resource is interconnected. The sale of charging energy to an electric storage resource that the resource then resells into the RTO/ISO markets is a sale for resale in interstate commerce and thus subject to the Commission's jurisdiction.[358]

296. With respect to concerns about electric storage resources' use of the distribution system, we note that, in *PJM Interconnection L.L.C.*, the Commission permitted a distribution utility to assess a wholesale distribution charge to an electric storage resource participating in the PJM markets.[359] Consistent with this precedent, we find

[358] *See Norton Energy Storage*, 95 FERC at 62,701-02; *see also PJM Interconnection*, L.L.C., 132 FERC ¶ 61,203 at P 7.

[359] *See PJM Interconnection L.L.C.*, 149 FERC ¶ 61,185 at P 12 (wholesale distribution charge that ComEd will assess to Energy Vault is a weighted average *(continued ...)*

Source: FERC Order 841 Sec. H. ¶ 296 & Footnote 359

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that it may be appropriate, on a case-by-case basis, for distribution utilities to assess a charge on electric storage resources similar to those assessed to the market participant in that proceeding.

297. With respect to efficiency losses, consistent with *Norton Energy Storage*, we find that efficiency losses are charging energy and therefore not a component of station power load.[360] Accordingly, the charging energy lost to conversion inefficiencies should also be settled at the wholesale LMP as long as those efficiency losses are an unavoidable component of the conversion, storage, and discharge process that is used to resell energy back to the RTO/ISO markets and are not a component of what an RTO/ISO considers onsite load. With respect to directly integrated and other ancillary loads, we provide the RTOs/ISOs flexibility to determine whether they are a component of charging energy or a component of station power.

carrying charge that is applied on a case-by-case basis, depending on the distribution facilities expected to be used in providing wholesale distribution service), *order on reh'g*, 151 FERC ¶ 61,231 at PP 16-18.

[360] *See Norton Energy Storage*, L.L.C., 95 FERC at 62,702 (stating that "[t]he fact that pumping energy or compression energy is not consumed means that the provision of such energy is not a sale for end use that this Commission cannot regulate.").

Delivery Tariffs for FTM Distribution-Tied ESRs

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Alternative from FERC Order 841: Wholesale Distribution Charge

- In 2014 Energy Storage Association (ESA) requested a **rehearing**, claiming ComEd did not follow its own tariff rules, deeming the FTM battery a "Load Serving Entity" (LSE), which is subject to a Fixed Charge Rate, rather than a "Generating Unit," which is not. FERC denied rehearing.
- In 2015 ESA requested a FERC Technical Conference to standardize cost allocation for the Distribution-tied FTM ESR use case, but FERC "demurred on the grounds that, because wholesale distribution charges were being applied on a case-by-case basis, there was no need '**at this time**.'"
- In August 2018, based on Shell Regulatory outreach to ESA, the trade group still holds to its position that Distribution-tied FTM ESRs should be treated as "Generating Units" and **not** be assessed Fixed Charge Rate, rather interconnection costs only and other incremental costs determined for such cases.

151 FERC ¶ 61,231
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;
Philip D. Moeller, Cheryl A. LaFleur,
Tony Clark, and Colette D. Honorable.

PJM Interconnection, L.L.C. Docket No. ER15-3-001
Commonwealth Edison Company

ORDER DENYING REHEARING

(Issued June 18, 2015)

1. On November 28, 2014, the Commission accepted proposed revisions to Attachment H-13 (Network Integration Transmission Service for Commonwealth Edison Company (ComEd) of the PJM Open Access Transmission Tariff (Tariff) submitted by PJM Interconnection, L.L.C. (PJM) on behalf of ComEd.[1] The revisions allow ComEd to begin assessing a wholesale distribution charge to Energy Vault LLC (Energy Vault). The Energy Storage Association (ESA) has requested rehearing of the November 28, 2014 Order. In this order, we deny rehearing.

Source: https://www.ferc.gov/whats-new/comm-meet/2015/061815/E-7.pdf

ATTACHMENT H-13

Annual Transmission Rates -- Commonwealth Edison Company for Network Integration Transmission Service

7. An annual Fixed Charge Rate of 24% shall apply to the net distribution plant that is directly assigned to a customer taking wholesale distribution service over ComEd distribution facilities. The net distribution plant will be directly assigned to the customer based on the customer's pro-rata share of the non-coincident peak loading of the distribution facilities necessary to provide the service. Generating units connected at the distribution level and requiring wholesale distribution service will not be assessed a charge based on application of the Fixed Charge Rate, but will be responsible for paying interconnection costs and other incremental costs determined for such customer.

Source: PJM OATT Attachment H-13 ¶ 7– ComEd Network Integration Transmission Service (NITS)

Setting Coherent FTM Distribution-Tied ESR Tariff Definitions

FERC Order 841 = Opportunity to Define "ESR" Classification Across Markets

As of 2018, FTM Distribution-Tied Storage is all in the eye of the beholder.

Is it a **"Generating Unit"** or

a **"Load Serving Entity"** or

a **"T&D Asset"** or

a full-fledged **"Commercial Retail Account"**?

YES (and NO)

US has a rare opportunity to frame a coherent set of definitions for an "ESR" service classification for this new breed of electric account.

Setting Coherent FTM Distribution-Tied ESR Tariff Definitions

FERC Order 841: Leading By Example
Opportunity to Define Coherent "ESR" Classification Across the States

- Look to ISOs/RTOs creating new ESR tariffs/asset classes based on FERC Order 841
- Extend ISO/RTO tariff design work to Utilities to create coherent set of definitions for FTM ESR
- Eliminate ambiguity (& soft costs!) over how to classify a given Distribution or Bulk Storage asset
- Clarify and harmonize definition & treatment of Distribution or Bulk Storage for purposes of:
    - T&D Tariffs Across Markets and Utility Territories
    - ISO/RTO Wholesale Market Participation
    - Federal, State and Local Tax & Incentive Treatment
    - Federal, State and Local Permitting

FERC/DOE could provide real leadership by offering a framework to finally define this new breed of electric account

Aligning "ESR" definitions would provide a regulatory precedent that would benefit the storage industry nationwide or even globally—and expedite gigawatt-scale storage.

Cases to Watch for FTM Distribution-Tied ESR Rulemaking Developments

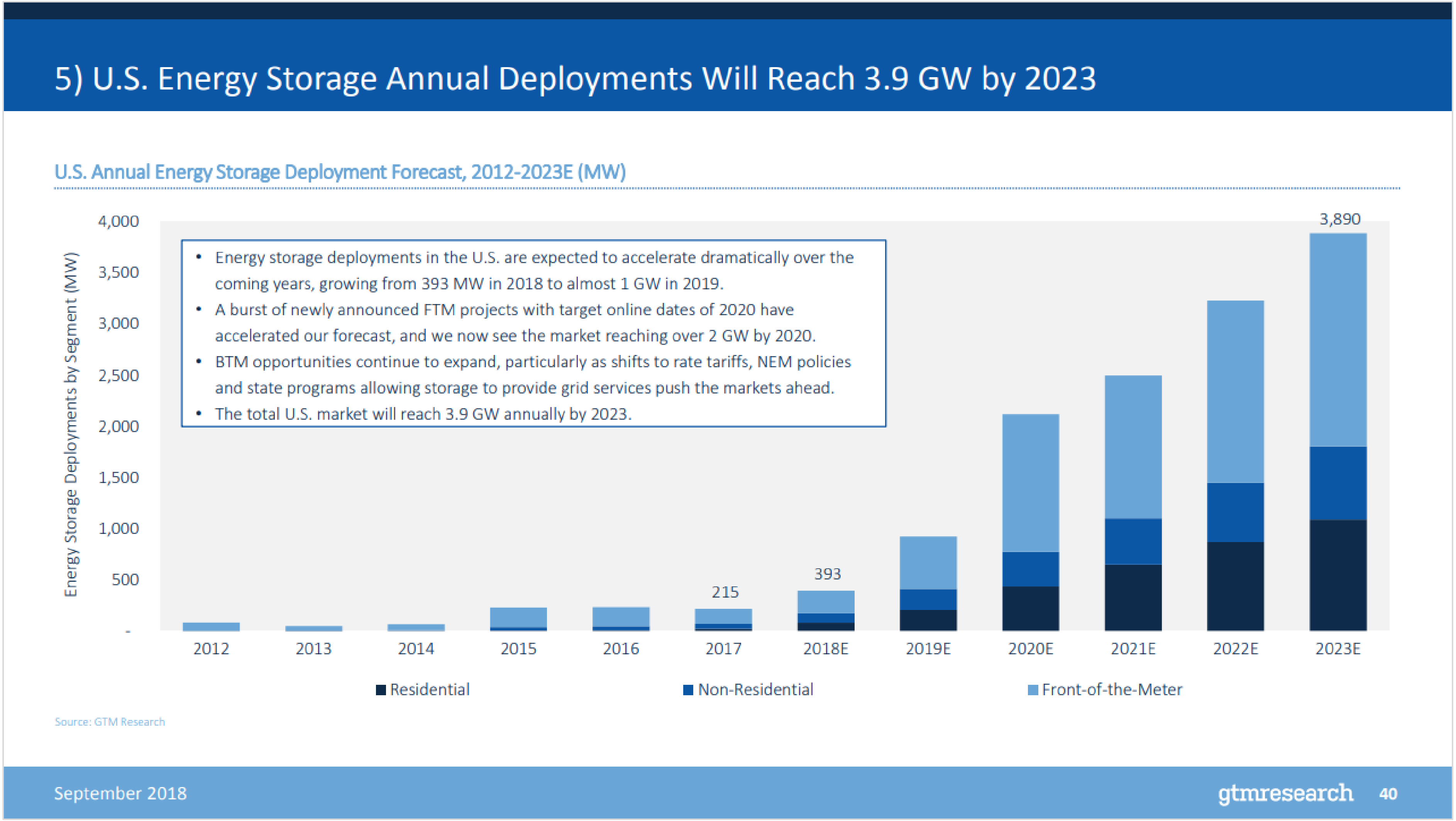
- NYS Storage Roadmap & Distributed System Implementation Plans (DSIPs)
- CA Storage Roadmap & Integrated Resource Plans (IRPs)
- American Electric Power (AEP) Case to Public Utility Commission of Texas (PUCT)
- Rehearing Requests to FERC on Order 841
    - NARUC
    - American Municipal Power, American Public Power Association, and National Rural Electric Cooperative Association (NRECA)
    - Edison Electric Institute

Source: State-federal concerns could dim FERC's landmark storage order (utilitydive.com)

FTM Storage Projected to Grow at Gigawatt Scale Annually

In order to achieve optimal "value stacking," FTM Distribution-tied ESRs are set to be a significant portion of this projected growth, representing hundreds or thousands of this new breed of electric account by 2023 and beyond.

Ratemaking can no longer be done on a case-by-case basis, utility by utility, market by market. Lest the US miss another opportunity to miss another opportunity in its transition to new energies.



Source: Grid Edge Quarterly Executive Briefing: Q3 2018 (greentechmedia.com)

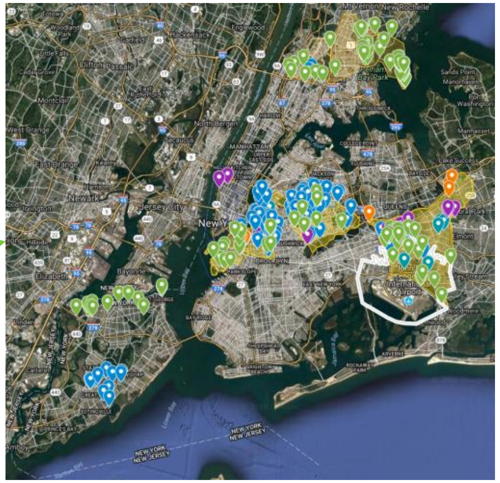
Grand Harmonization of Mapping Tools Required to Overcome Information Asymmetry Between Utilities & Developers (& Everyone Else)

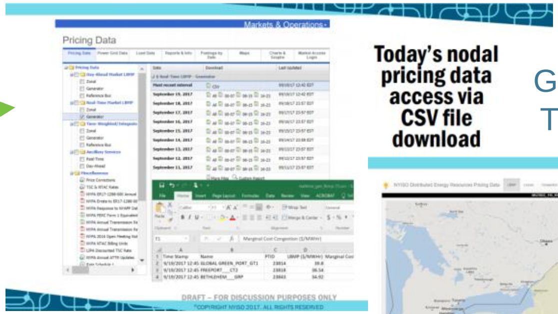
gi energy

Where to put ESRs?

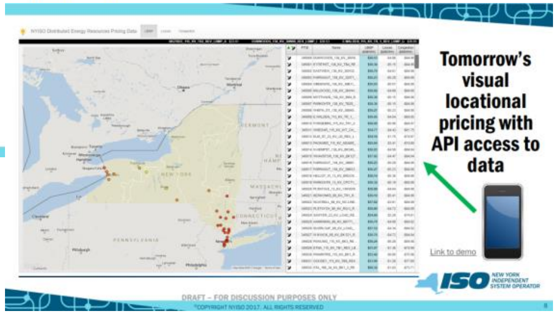
REV Demo

"Darts Looking for Bullseyes"





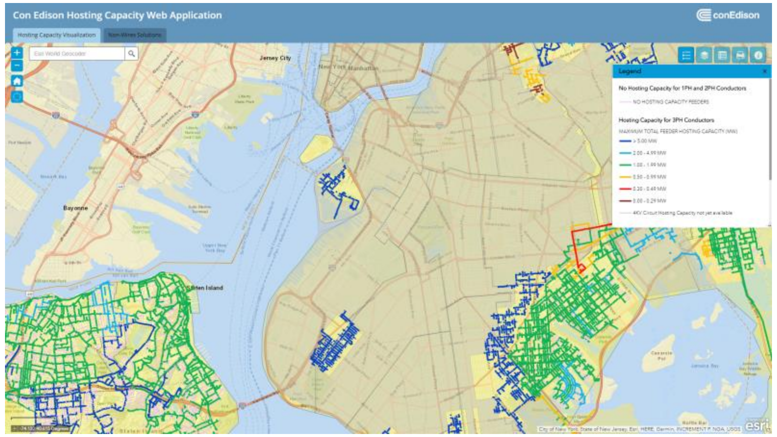
NYISO-Joint Utilities
Granular Pricing Visualization (Q2 2018) & Transmission Node Mapping (2019-2020)



Source: Granular Pricing & Market Price Delivery NYISO MIWG 9/29/17

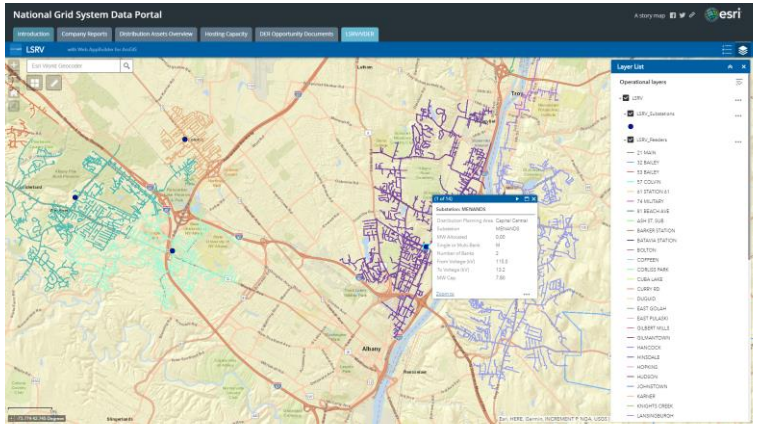
Utility-Developer "Virtuous Feedback Loop" Emerging via REV

Joint Utilities DG Hosting Capacity Mapping



Source: Con Edison Hosting Capacity Web Application

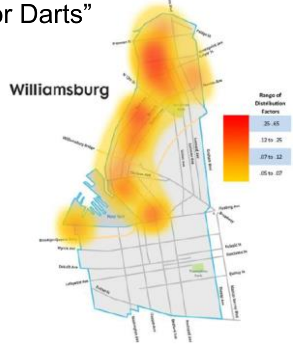
Joint Utilities Locational System Relief Value (LSRV) and Value of DER (VDER) Mapping



REV Non-Wires Solutions RFPs

"Bullseyes Looking for Darts"

conEdison



Grand Harmonization of Mapping Tools Required to Overcome Information Asymmetry Between Utilities & Developers (& Everyone Else)

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Recent Debate Over Rules for Accessing Integrated Capacity Analysis (ICA) Maps in CA

gtm

Explaining the Unfolding Conflict Over Grid Data Access in California

California's big utilities are planning to unveil online maps that give distributed energy developers much deeper data on grid edge capacity. But they've also just banned access to the maps they already have based on data security concerns.

September has been a good news, bad news kind of month for California's efforts to map every circuit of its major utility distribution grids.

The good news came at the start of the month, when California's investor-owned utilities unveiled plans for the latest version of their integrated capacity analysis maps. The new ICA 2.0 maps, set to be unveiled this year, will see real-world, circuit-by-circuit, hour-by-hour data across the state's distribution grids — including data that's good enough to feed into DER interconnection processes now under development for the state's Rule 21.

The bad news came a week later, when utilities Pacific Gas & Electric, Southern California Edison and San Diego Gas & Electric abruptly limited access to the ICA 1.0 maps, even to people who've been using them since they were launched in 2016. These groups have found themselves locked out of the maps, unless they're able to get a motion from a California Public Utilities Commission administrative law judge, allowing them access under strict NDA, on a person-by-person basis.

Source: Explaining the Unfolding Conflict Over Grid Data Access in California (greentechmedia.com)

"We're back to flying blind again"

Tim McDuffie, engineering director for California solar and energy services developer CalCom Energy, was also shocked to find that his company had been locked out of the utility ICA maps last week.

"It's a huge detriment to us," he said. While the ICA 1.0 maps have their limits, they are critically useful in guiding his company toward circuits that are largely free of the kind of interconnection constraints that can sink a project, he said.

CalCom do
codes — re
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DRPEP

https://ltmdrpep.sce.com/drpep/

Southern California Edison DRPEP

To obtain access, a user must first submit a motion to the California Public Utilities Commission requesting access. If such a motion is granted, SCE will then require execution of a Non-Disclosure Agreement ("NDA"). Once the NDA is executed, the user will be provided access. For more information concerning this process to obtain access, please see page 21 of the July 24, 2018 *Administrative Law Judge's Ruling Addressing Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company's Claims for Confidential Treatment and Redaction of Distribution System Planning Data Ordered by Decisions 17-09-026 and 18-02-004.*

To access the CPUC ruling, click here

Login

Source: https://ltmdrpep.sce.com/drpep/

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REGULATION & POLICY

California Utilities Ordered to Reopen Grid Maps

Regulators have resolved a conflict between utilities and distributed energy resource providers over grid edge data access—for now.

JEFF ST. JOHN | OCTOBER 10, 2018

A new ruling reopens access to long-available data.

There's an unfolding conflict between the state's investor-owned utilities and distributed energy resources providers in California that highlights the complexities of sharing utility data with the broader world.

Last month, we introduced our GTM Squared readers to the strange case of California's disappearing Integrated Capacity Analysis maps. In simple terms, the conflict can be summed up this way: Utilities restricted access to long-available data on critical infrastructure security grounds, DER advocates protested, and state regulators have now told utilities to restore the data they took away.

Source: California Utilities Ordered to Reopen Grid Maps (greentechmedia.com)