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Hosting Capacity Stakeholder Webinar

(November 18, 2021)

Engagement Group Ground Rules*

- All stakeholder engagement (Advisory Group and Engagement Group) meetings, webinars and information exchange are designed solely to provide an open forum or means for the expression of various points of view in compliance with antitrust laws.
- Under no circumstances shall stakeholder engagement activities be used as a means for competing companies to reach any understanding, expressed or implied, which tends to restrict competition, or in any way, to impair the ability of participating members to exercise independent business judgment regarding matters affecting competition or regulatory positions.
- Proprietary information shall not be disclosed by any participant during any stakeholder engagement meeting or its subgroups. In addition, no information of a secret or proprietary nature shall be made available to stakeholder engagement members.
- All proprietary information which may nonetheless be publicly disclosed by any participant during any stakeholder engagement meeting or its subgroups shall be deemed to have been disclosed on a non-confidential basis, without any restrictions on use by anyone, except that no valid copyright or patent right shall be deemed to have been waived by such disclosure.
- AG & EG discussions will be open forums without attribution and no public documents by the AG or EG will be produced unless publication is agreed upon by the group.

**Ground Rules adapted from the JU Advisory Group*

Agenda and Meeting Goals

Agenda Item	Time
Introductions and Meeting Goals	~5
Discuss Initial JU Hosting Capacity Roadmap for Storage	~15
Discuss Analysis Criteria and Approach	~10
Discuss Cost-Sharing Mechanism	~10
Open Discussion / Q&A	~25

Meeting Goals

- Provide an update on the JU's most recent thinking towards the draft storage hosting capacity roadmap.
- Solicit input from energy storage stakeholders on the latest draft roadmap.

Storage Hosting Capacity Maps Overview

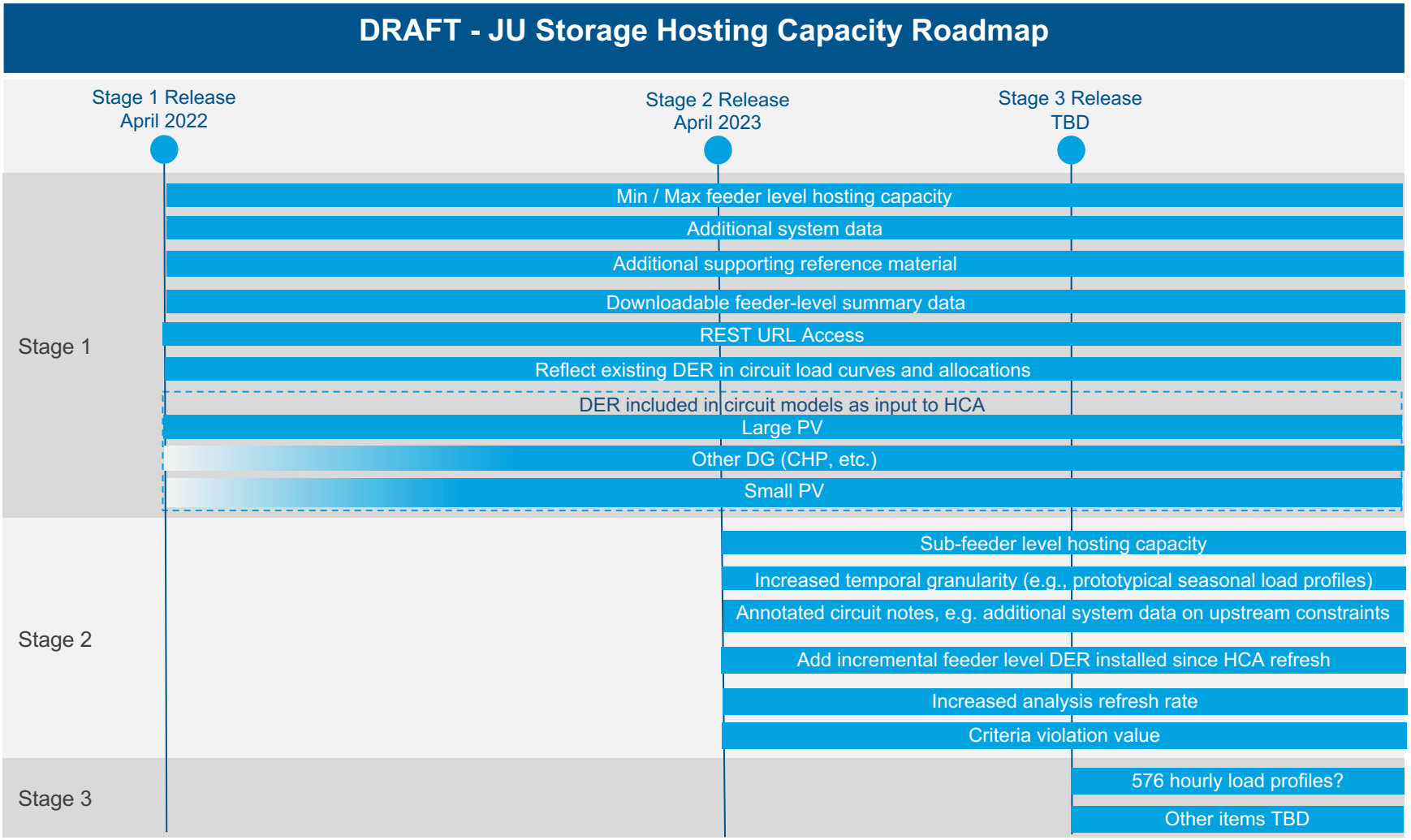
In August, the JU presented

1. The initial storage hosting capacity map will be at a feeder-level
2. The JU are targeting an April 2022 release date for the first storage hosting capacity map.
3. The storage hosting capacity map will allow for toggling between load and generation hosting capacity.
4. The storage hosting capacity maps are for applications that connect via the NY state SIR

Due to stakeholder Feedback, the JU will…

- Show the additional storage connected on a monthly basis consistent with how PV is presented.
- Consider 576-hour modeling in storage roadmap.
- Add to the map sub-transmission circuits that can host distributed generation.
- Show output consistent with the cost-sharing order

DRAFT Straw Proposal - Storage Hosting Capacity Roadmap



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Stage 1 Items – April 2022

1	**Feeder-Level Hosting Capacity (min/max)**
2	**Additional System Data**
3	**Downloadable Feeder-Level Summary Data**
4	**Rest URL Access**
5	**Reflect Existing DER in Circuit Load Curves and Allocations**

Additionally, due to stakeholder feedback, the JU will…

- post sub-transmission circuits that are available to host distributed generation on their individual portals to help developers best evaluate options for storage connections.
- show the additional storage connected on a monthly basis consistent with how PV is presented.

Stage 2 Items – April 2023

1	**Sub Feeder-level Hosting Capacity (min / max).** Amount of load/generation that can be installed at that line section, without significant circuit upgrades, at the time the hosting capacity analysis was performed.
2	**Increased Temporal Granularity.** Prototypical seasonal load profiles incorporated into hosting capacity analysis.
3	**Annotated Circuit Notes.** Additional info on potential constraints not captured in the analysis, e.g. additional info on substation and transmission-level constraints.
4	**Incremental DER Installed Since Last HCA Refresh.** The aggregated DG that has been connected on the selected feeder since the listed HCA refresh date.
5	**Increased Analysis Refresh Rate,** Semi-annual hosting capacity refresh for circuits experiencing greater than 500 kW of load since the last refresh.
6	**Criteria Violation Value.** Min and max hosting capacity by analysis criteria

EPRI DRIVE Tool

- For consistency, the utilities conduct their hosting capacity analysis using EPRI's DRIVE tool and present their results in the ESRI mapping environment.
- DRIVE allows each utility to calculate the hosting capacity for their distribution system using EPRI's streamlined methodology.
- DRIVE's methodology is an accurate means for calculating hosting capacity and includes the functionality for evaluating storage.
- DRIVE continues to be updated with input from the DRIVE User's Group comprised of a broader group of utilities and EPRI.

Comparing DER Assumptions and Modelling

Existing Solar PV Stage 3 HCA Spec:

Reflected in circuit load curves / load allocations	
Large PV	Yes
Small PV	Yes
Storage	Yes
Other DG	Yes

Included in Stage 3 Circuit Models as an input to HCA	
Large PV	Yes
Small PV	Yes, if possible
Storage	No
Other DG	Yes

Stage 3 HCA outputs provided	
Large PV	Yes
Small PV	No
Storage	No
Other DG	No

DRAFT Storage HCA Spec:

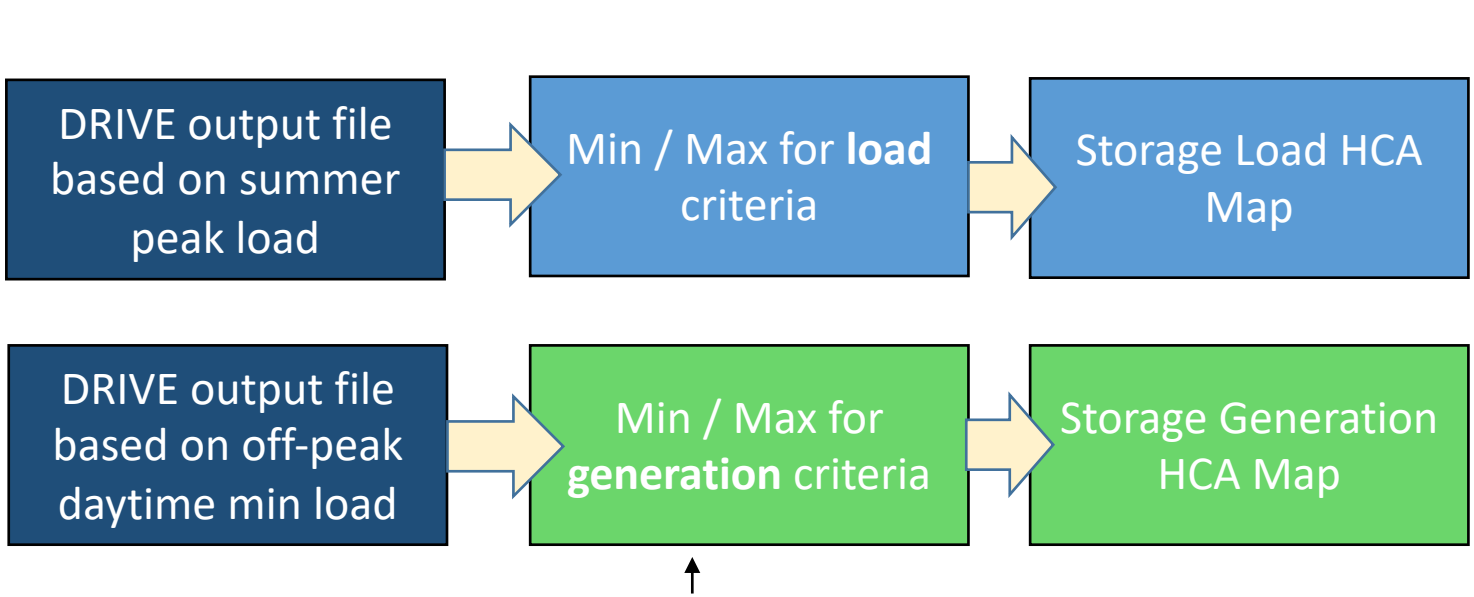
Reflected in circuit load curves / load allocations	
Large PV	Yes
Small PV	Yes
Storage	Yes
Other DG	Yes

Included in Stage 3 Circuit Models as an input to HCA	
Large PV	Yes
Small PV	Yes, if possible
Storage	Yes
Other DG	Yes

Stage 3 HCA outputs provided	
Large PV	No
Small PV	No
Storage	Yes
Other DG	No

Approach to Creating Separate Displays for Load and Generation

- Providing separate displays for load and generation hosting capacity should help initially address requests for greater transparency on the analysis criteria violation.



Example Storage Feeder HCA

Min: 800 kW
Max: 1200 kW

Min: 200 kW
Max: 600 kW

Note: The min/max generation criteria will be specific to storage and not solar PV. This includes changes in fault current contribution and potential voltage changes.

Load HCA - JU DRIVE Criteria and Settings Assumptions

DRIVE Tool Settings by Utility with Recommended EPRI Threshold Settings							
Category	**Criteria**	**Central Hudson**	**Con Edison**	**National Grid**	**NYSEG & RG&E**	**Orange and Rockland**	**Hosting Capacity Threshold**
Voltage	Primary Over-Voltage	No	No	No	No	No	1.05 Vpu voltage magnitude
	Primary Under-Voltage	Yes	Yes	Yes	Yes	Yes	0.95 Vpu voltage magnitude
	Primary Voltage Deviation	Yes	Yes	Yes	Yes	Yes	3% voltage change
	Regulator Voltage Deviation	Yes	No	Yes	Yes	Yes	50% of bandwidth at regulators
Loading	Thermal for Charging (Demand)	Yes	Yes	Yes	Yes	Yes	100% normal rating
	Thermal for Discharging (Generation)	No	No	No	No	No	100% normal rating
Protection	Unintentional Islanding*	No	No	No	No	No	67% minimum loading

**To be evaluated in DRIVE at the feeder head only, but not to be included in the results affecting the heat mapping. The minimum hosting capacity as determined by the unintentional islanding criteria is to be added as a separate item in the data pop-up. The 67% minimum loading threshold is to be used as a proxy for the Sandia screens.*

Generation HCA - JU DRIVE Criteria and Settings Assumptions

DRIVE Tool Settings by Utility with Recommended EPRI Threshold Settings							
Category	**Criteria**	**Central Hudson**	**Con Edison**	**National Grid**	**NYSEG & RG&E**	**Orange and Rockland**	**Hosting Capacity Threshold**
Voltage	Primary Over-Voltage	Yes	Yes	Yes	Yes	Yes	1.05 Vpu voltage magnitude
	Primary Under-Voltage	No	No	No	No	No	0.95 Vpu voltage magnitude
	Primary Voltage Deviation	Yes	Yes	Yes	Yes	Yes	3% voltage change
	Regulator Voltage Deviation	Yes	No	Yes	Yes	Yes	50% of bandwidth at regulators
Loading	Thermal for Charging (Demand)	No	No	No	No	No	100% normal rating
	Thermal for Discharging (Generation)	Yes	Yes	Yes	Yes	Yes	100% normal rating
Protection	Unintentional Islanding*	Yes	Yes	Yes	Yes	Yes	67% minimum loading

**To be evaluated in DRIVE at the feeder head only, but not to be included in the results affecting the heat mapping. The minimum hosting capacity as determined by the unintentional islanding criteria is to be added as a separate item in the data pop-up. The 67% minimum loading threshold is to be used as a proxy for the Sandia screens.*

Recent Order Approving Cost-Sharing Mechanism

- The recent "Order Approving Cost-sharing Mechanism And Making Other Findings" or "Cost Sharing Order" was issued on July 16, 2021.

- Joint Utilities consulted with stakeholders through the IPWG to determine information regarding utility planned upgrades
  - Information added to the Hosting Capacity Maps was due for Commission review October 14, 2021.

- Order signaled the hosting capacity maps should show for projects within the Capital Project Queue (where construction will take longer than 24 months)
  - Location of a utility's planned upgrade
  - Anticipated impact of incremental hosting capacity of the upgrade
  - Proposed in-service date of the upgrade
  - Known or estimated costs of the incremental hosting capacity

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Order Approving Cost-sharing Mechanism And Making Other Findings

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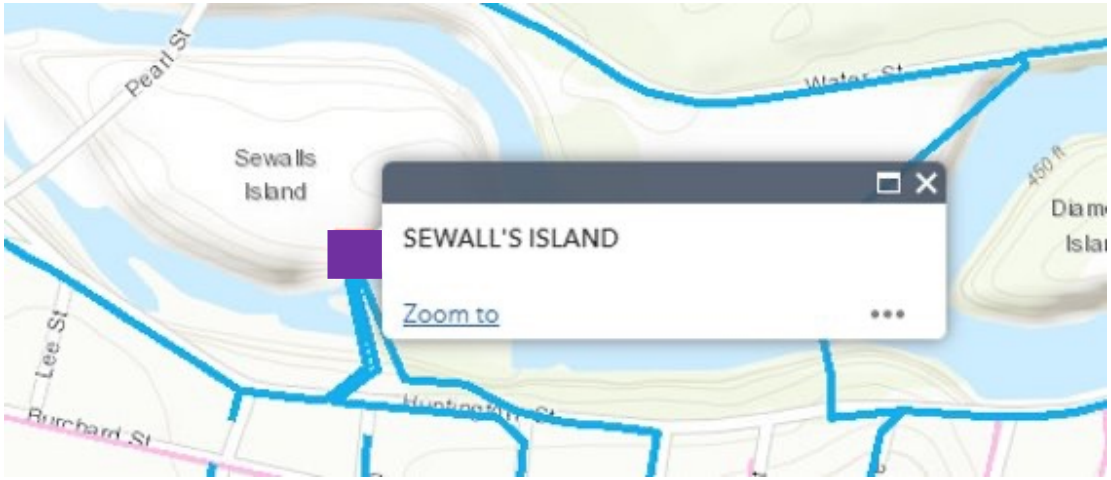
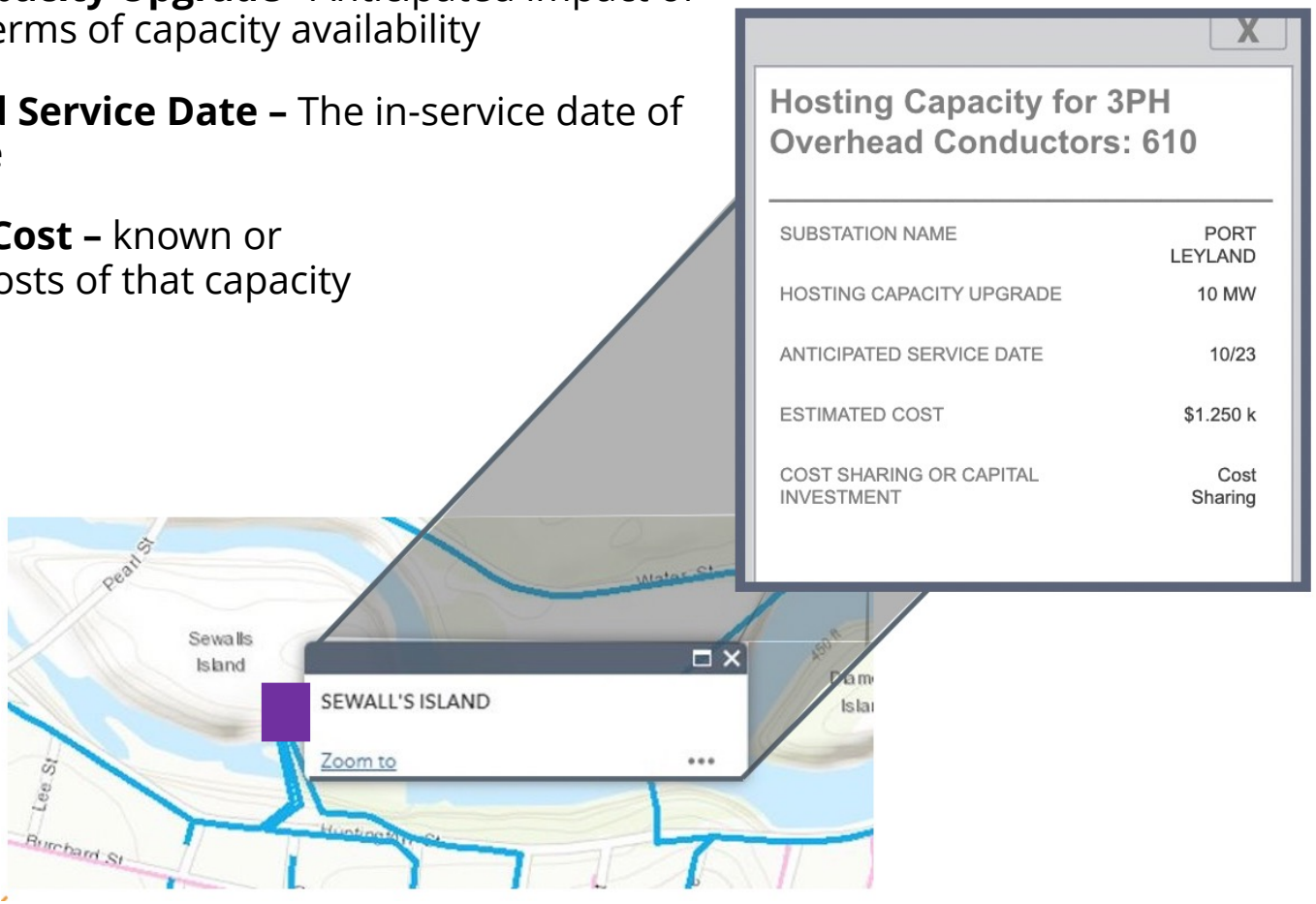
Cost-Sharing Mechanism: Display

- Cost sharing locations will be identified at the substation level in a different color. Users will also be able to filter for all cost sharing jobs at the substation level.



Cost-Sharing Mechanism: Draw-down Items

- **Substation –** A planned upgrade's location
- **Hosting Capacity Upgrade –**Anticipated impact of project in terms of capacity availability
- **Anticipated Service Date –** The in-service date of the upgrade
- **Estimated Cost –** known or estimated costs of that capacity



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Q&A