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OF NEW YORK

Hosting Capacity Stakeholder Webinar

(May 20, 2020)

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

1. Introductions
2. Recap Recent Activities
3. Stage 3.1 Update
4. Stakeholder Survey Summary
5. Future Enhancement Prioritizations (Stage 3.2 and beyond)

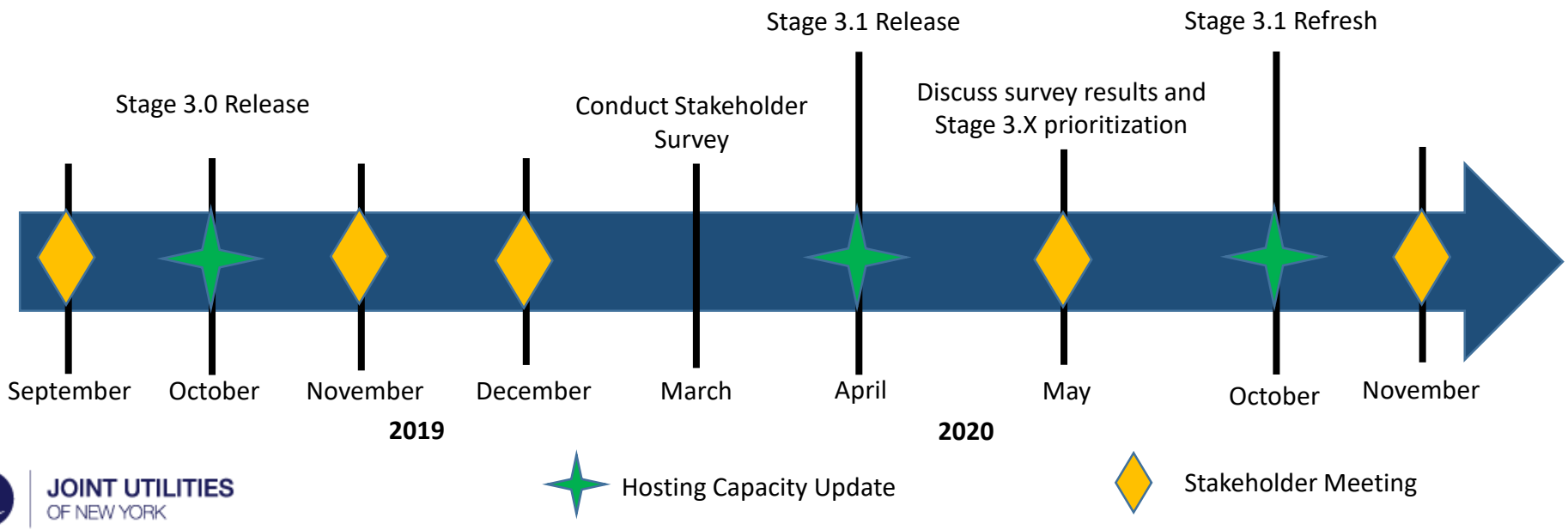
Meeting Goals

- Provide an overview of the group's recent activities and welcome any new members to the discussion.
- Review and discuss the results of the hosting capacity survey, with a focus towards prioritizing future enhancements.
- Build a further common understanding of the priority items requiring further development / implementation in the hosting capacity displays.
- Discuss draft proposals for Stage 3.2 and subsequent enhancements to prioritize in Stage 3.X and Stage 4.
- Begin to discuss a timeline for Stage 3.2 and subsequent updates for development and implementation.

Recent Activities

The JU held three stakeholder engagement sessions surrounding the release of Stage 3.0 to solicit input and feedback on the displays.

- To help solicit further input from a broader audience and users of the displays, the JU conducted a stakeholder survey reaching ~ 1,475 stakeholders.
- 94 new stakeholders have been added to the stakeholder engagement group as a result
- The results of the stakeholder survey have helped to prepare and prioritize ongoing discussions with stakeholders.



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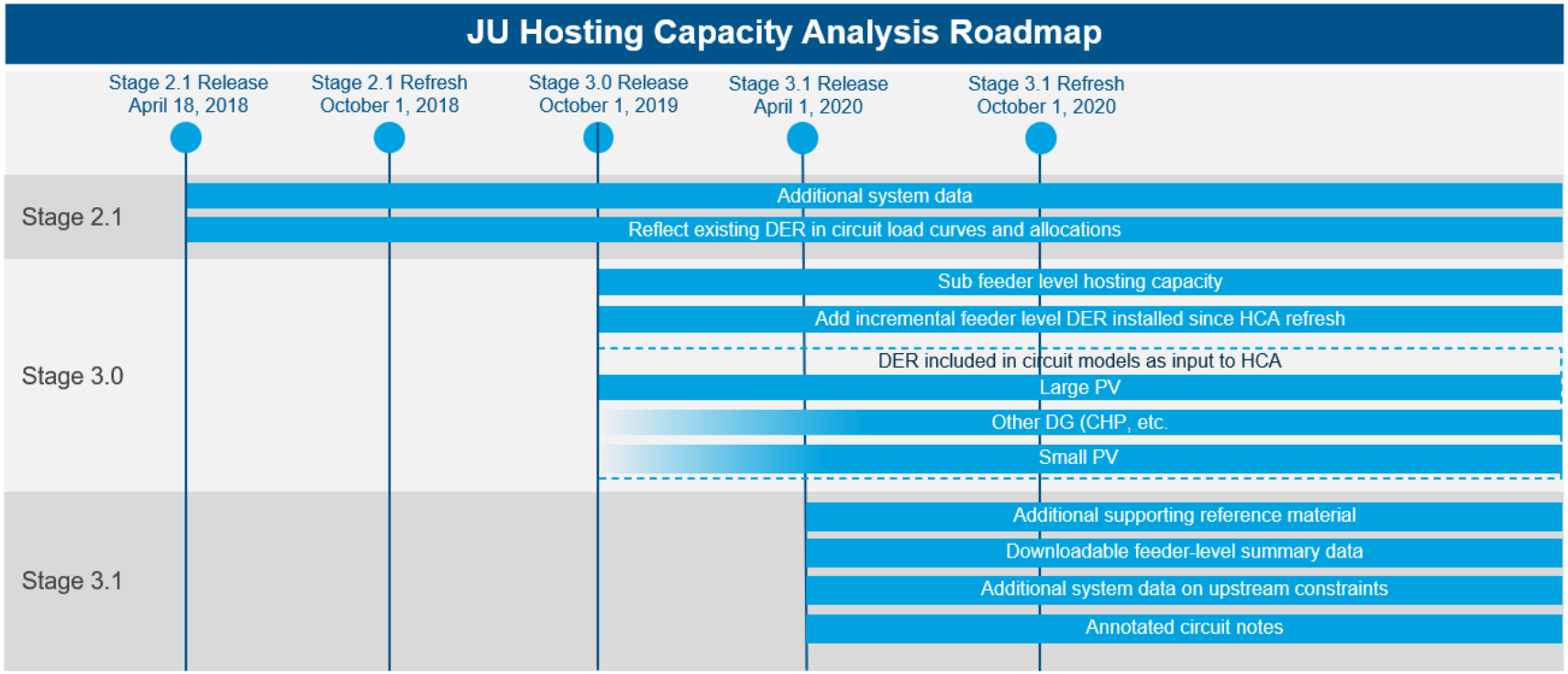
Recent Updates to the Hosting Capacity Displays



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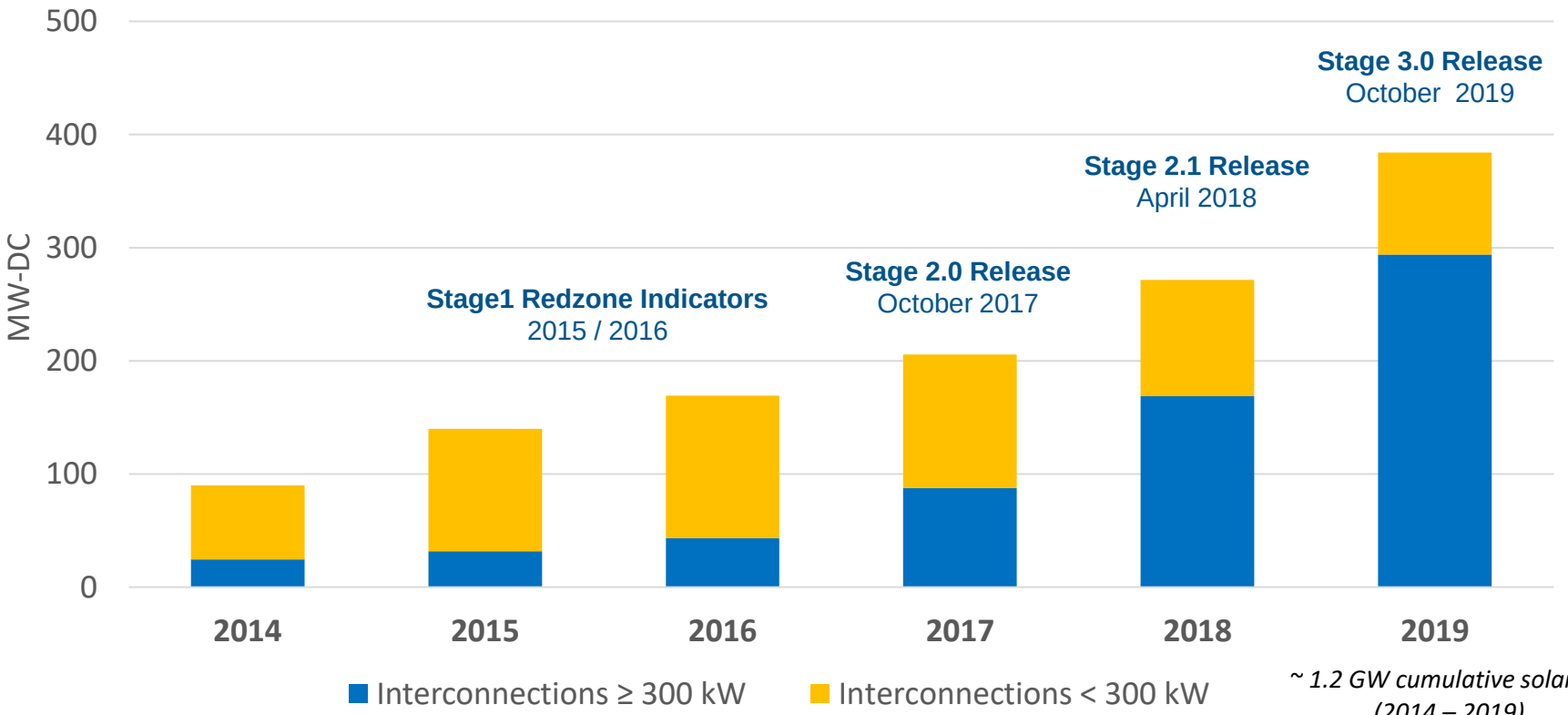
Supporting Solar PV and Future DER Adoption

- Developers are a key part to that success; the hosting capacity roadmap will continue to evolve in support of developer community and State policy goals.



~ 1.2 GW cumulative solar PV (2014 – 2019)

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https://data.ny.gov/Energy-Environment/Solar-Electric-Programs-Reported-by-NYSERDA-Beginn/3x8r-34rs/data

Stage 3.1

Continuing to Make Progress with Stage 3.1

- The three stakeholder meetings in 2019 provided the JU with well-developed suggestions to many of the potential enhancements; this allowed for interim progress concurrent with the stakeholder survey.

- The Stage 3.1 update has already begun to address stakeholder feedback provided at previous meetings regarding:
  - EPRI DRIVE Utility Inputs, Analyses Used, and Study Parameters Transparency
  - Better Communication of Available Reference Materials and Supporting Documentation
  - Upstream Substation/Bank-Level Constraints
  - Circuit Notes/Annotations (previously listed as Circuit Configurations)
  - Additional Map functionality (downloadability/filterability)

Stage 3.1 Release (April 1, 2020)

- The Stage 3.1 updates focused on greater transparency of the analysis, better communication of supporting materials, and greater access to the data – this includes:
  - Supporting material on the DRIVE tool inputs by utility, and additional user reference materials on the Stage 3.0 displays
  - Common attribute tables and downloadable feeder-level summary data (.csv) that includes the data elements currently available in the pop-ups
- The JU have also added the following items to the data pop-ups:
  - **Substation Bank/Transformer Nameplate/Thermal-Limits** – The substation transformer bank thermal nameplate capacity rating e.g. 5 MVA
  - **Substation 3V0 Protection Thresholds** – The remaining capacity before a 3V0 protection upgrade is required (Spreadsheet calculation to determine 2/3 of the minimum substation load with the heaviest loaded feeder disconnected)
  - **Annotated notes for additional circuit specific info** – Left to individual utility discretion

Additional Map functionality (downloadability/filterability)

- Each of the utilities have implemented an attribute table that includes downloadable feeder-level summary data (.csv or .xlsx) of the data elements currently available in the pop-ups.

- The attribute tables and downloadable feeder-level data is a step towards enabling developers to "search and filter" the HCA data to help identify, compare and evaluate appropriate sites for the type of project they want to build.

Example Attribute Table

B	C	D	E	F	G	H	I	J	K	L	M
Substation	**Feeder**	**Feeder Nominal Voltage (kV)***	**Max 3-Ph HC (MW)**	**Min 3-Ph HC (MW)**	**Anti-Islanding Hosting Capacity Limit (MW)**	**Feeder DG Connected (MW)**	**Feeder DG in Queue (MW)**	**Feeder DG Connected Since Last HCA Refresh**	**Load Zone**	**DG Connected/In Queue Refresh Date**	**HCA Refresh Date**
QUEENSBURY	36_38_29557	13.2	9.2	0.6	0.81	0	0	0	F-4	29-Sep-19	30-Sep-19
121 CLINTON ST	36_01_12161	4.8	1.9	0.3	0.18	0	0	0	A-1	29-Sep-19	30-Sep-19
124 ALMEDA AVE	36_01_12462	4.16	2.4	0.5	0.33	0.03501	0.0076	0	A-1	29-Sep-19	30-Sep-19
124 ALMEDA AVE	36_01_12463	4.16	2.55	2.55	0.13	0	0	0	A-1	29-Sep-19	30-Sep-19
124 ALMEDA AVE	36_01_12464	4.16	2.38	1	0.3	0	0.66	0	A-1	29-Sep-19	30-Sep-19

DRIVE Utility Inputs, Reference Materials & Supporting Documentation

- To provide stakeholders with a better understanding of the hosting capacity analyses, the JU have provided supporting material that includes:
  - A description of analyses conducted with useful links to supporting documentation e.g. HCA methodology and assumptions
  - Release notes on how Stage 3.0 differs from previous versions and introductory guidance material
  - Summary tables of DRIVE analysis criteria by utility with supporting definitions and threshold settings
  - Recordings of Stage 3.0 user demos
  - FAQs

Reference materials located here: https://jointutilitiesofny.org/wp-content/uploads/2020/03/JU-DRAFT-Stage-3.0-Reference-Materials-2020-02-26.pdf

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Upstream Substation/Bank-Level Constraints

- Developers' main request relating to substation/bank-level constraints is focused on their ability to identify the potential need for substation upgrades.

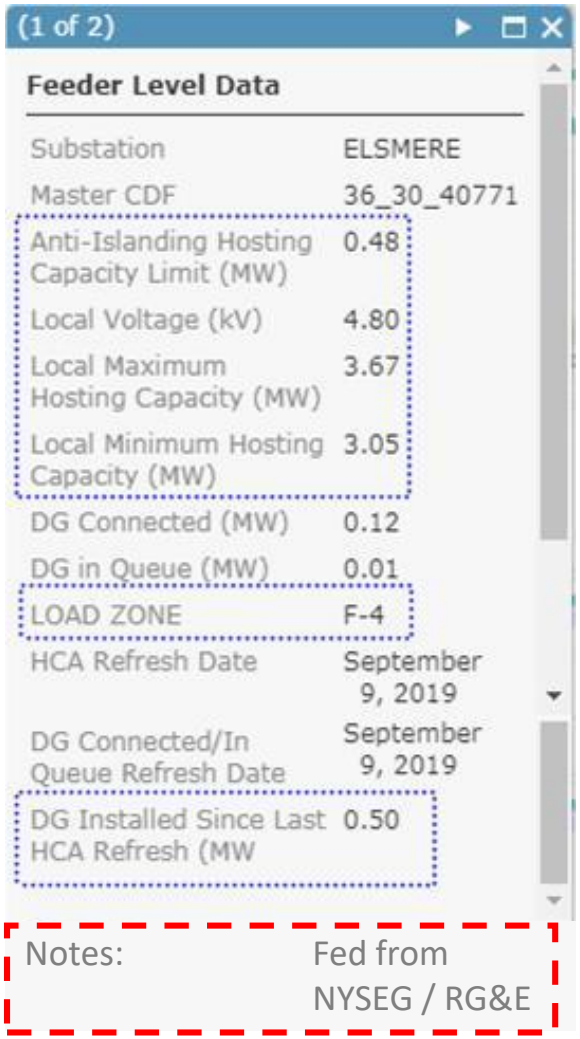
- With more information, a developer could avoid proposing projects where the supplying substation's saturation limit has already been exceeded.

- To help address this, the JU have added the following to the data pop-ups:
  - **Substation Bank/Transformer Nameplate/Thermal-Limit:** The substation transformer bank thermal nameplate capacity rating e.g. 5 MVA

  - **Substation 3V0 Protection Threshold:** The remaining capacity before a 3V0 protection upgrade is required (Spreadsheet calculation to determine 2/3 of the minimum substation load with the heaviest loaded feeder disconnected)

Annotated Circuit Notes

- Stakeholders suggested that annotations on the map would be helpful in the quoting process to budget in additional funds or prepare for a difficult and costly interconnection.
- The Joint Utilities have added annotations to note specific circuit configurations / constructions where that additional clarity is most valuable.
- Stakeholders are encouraged to reach out to the utility to help answer specific questions.



Stage 3.0

Stage 3.1

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Stage 3.1 Additions to the Data Pop-ups

(1 of 2)

Feeder Level Data

Substation	ELSMERE
Master CDF	36_30_40771
Anti-Islanding Hosting Capacity Limit (MW)	0.48
Local Voltage (kV)	4.80
Local Maximum Hosting Capacity (MW)	3.67
Local Minimum Hosting Capacity (MW)	3.05
DG Connected (MW)	0.12
DG in Queue (MW)	0.01
LOAD ZONE	F-4
HCA Refresh Date	September 9, 2019
DG Connected/In Queue Refresh Date	September 9, 2019
DG Installed Since Last HCA Refresh (MW	0.50
Notes	Fed from NYSEG/RG&E

(1 of 2)

Substation Level Data: ELSMERE

Substation/Bank Name	ELSMERE
Substation/Bank Installed DG (MW)	0.17
Substation/Bank Queued DG (MW)	0.01
Substation/Bank Total DG (MW)	0.18
2018 Substation/Bank Peak (MW)	4.90
Substation/Bank Thermal Capacity	6.00 MW
Estimated 3V0 Protection Threshold	1.25 MW
Substation Backfeed Protection	No
DG Connected/In Queue Refresh Date	September 9, 2019
HCA Refresh Date	September 9, 2019

Zoom to

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Stage 3.0 — Stage 3.1

Stakeholder Survey Summary

Survey Methods

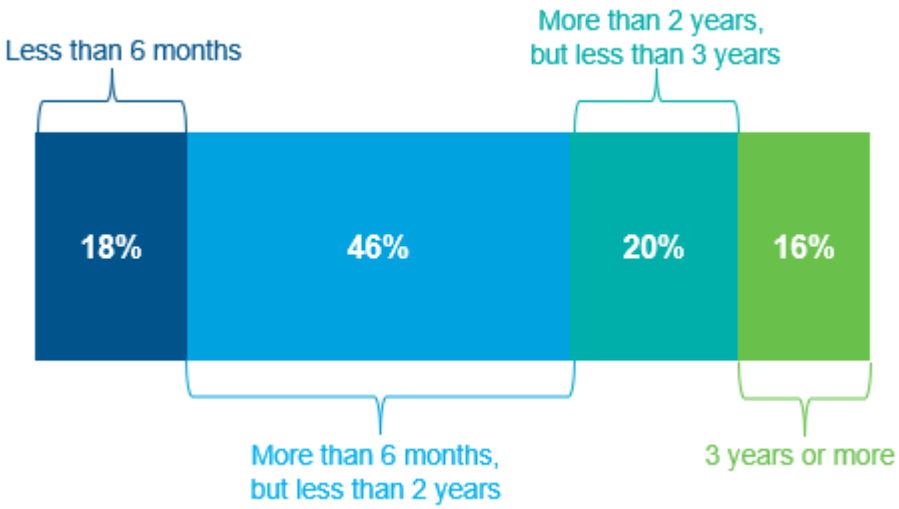
- Web survey of JU Hosting Capacity stakeholders
- Questionnaire developed by the JU and ICF, with multiple rounds of review
- Sample composed of 1,475 stakeholders
- Stakeholders received up to three contacts: invitation and 2 reminders in March 2020

Initial Take-Aways

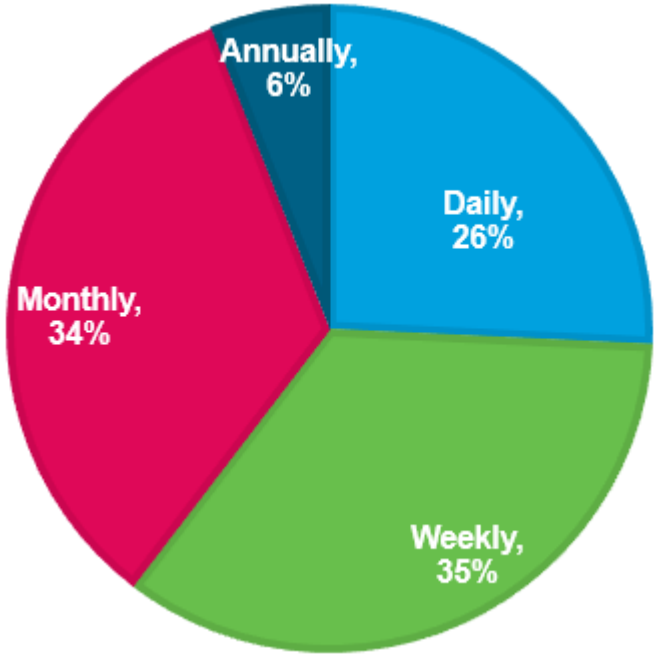
- Overall level of engagement is up with 141 completed surveys
- The survey audience was primarily solar PV developers
- More than half of stakeholders report to use the maps on at least a weekly basis
- Of the 15 listed Stage 3.X enhancements, 9 were categorized as “very important”
- Consistent themes in the open response questions emerged; some related to already identified enhancements, others were new suggestions added for consideration.

Usage Metrics

How long have you been using the Joint Utilities' hosting capacity maps?



How often do you use any of the Joint Utilities' hosting capacity maps?



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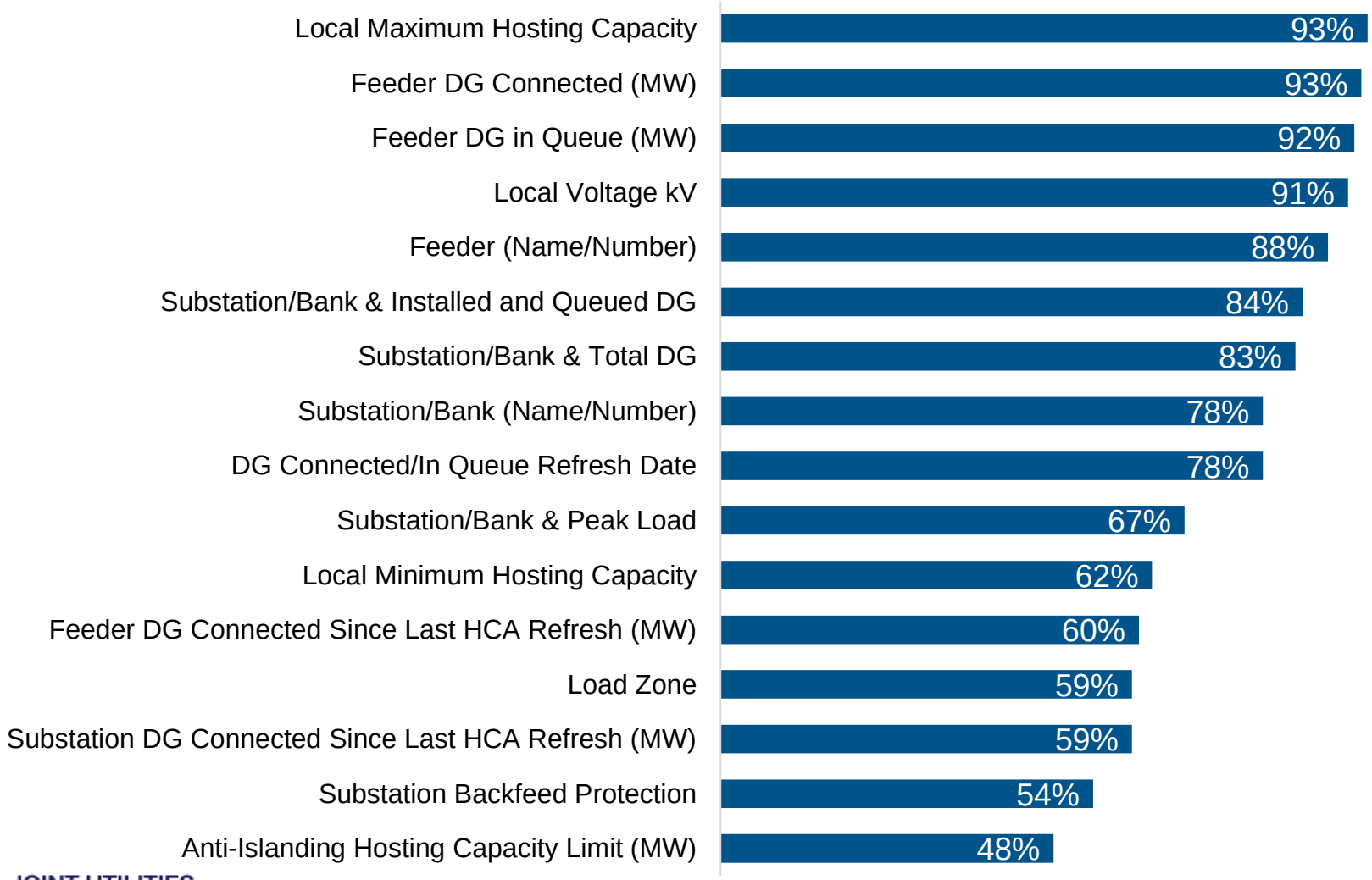
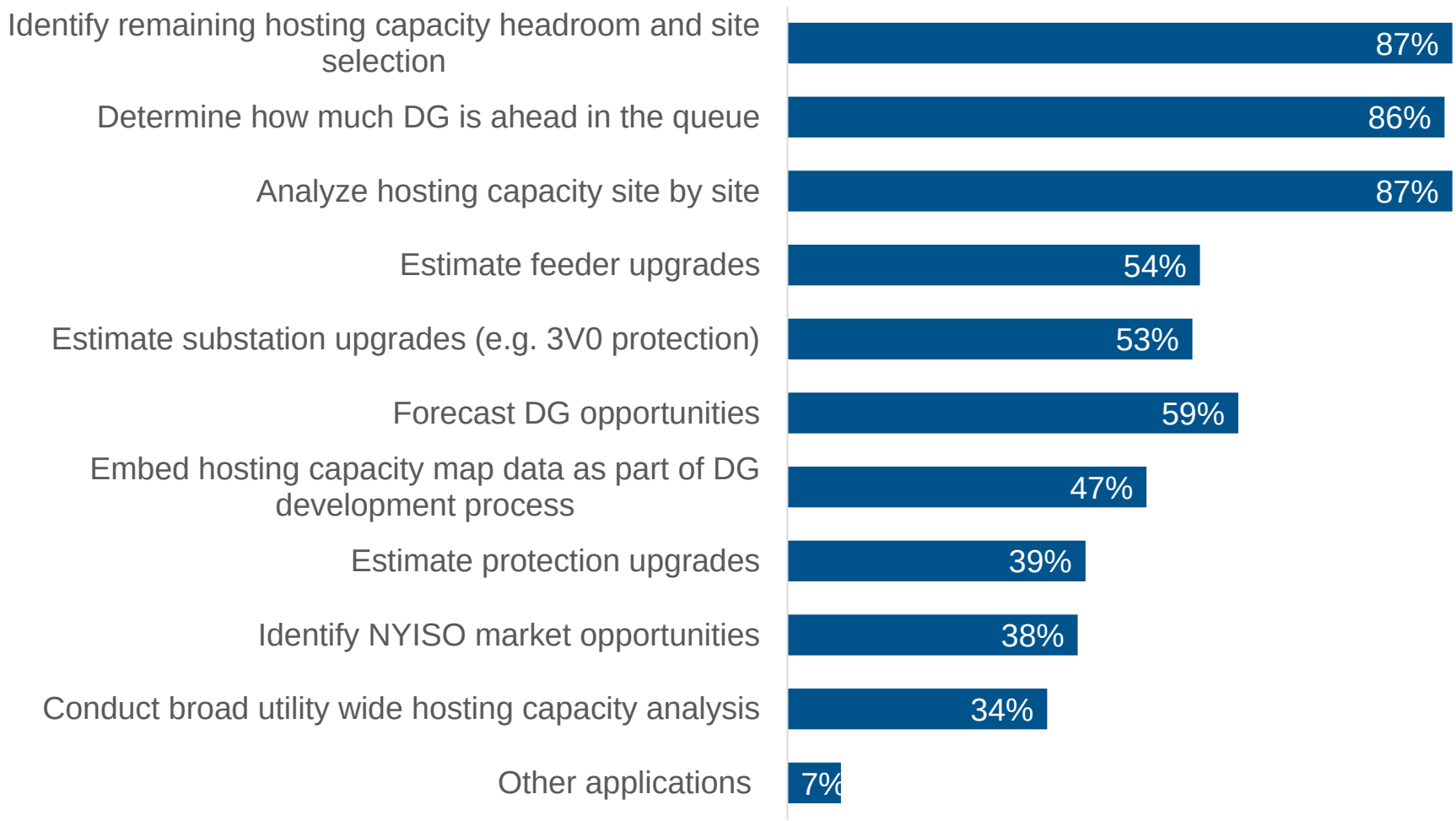
Useful Data Pop-up Items When Utilizing The Displays



How Stakeholders Are Currently Applying The Hosting Capacity Maps



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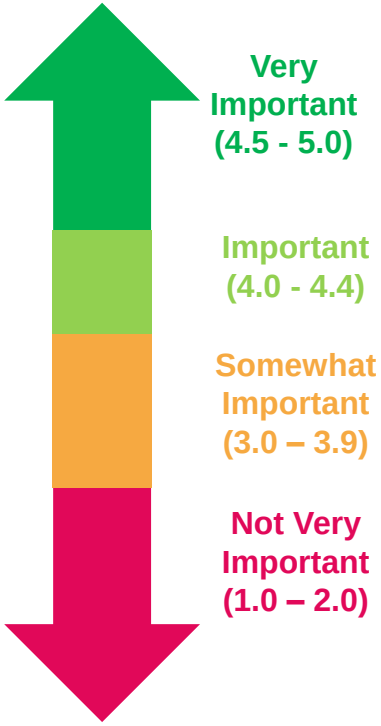
Stage 3.X Survey Prioritization (1/2)

- **Stakeholders were asked to rate the level of importance of each of the following proposed enhancements to your business, using a five-point scale where 1 is "not at all important," and 5 is "very important."**

- **Very Important 4.5 - 5**
  - Additional Map functionality (e.g. downloadability/filterability, API) – **Progress made in Stage 3.1**
  - Hosting Capacity Analysis for Energy Storage
  - Hosting Capacity for Hybrid Solar + Storage
  - Upstream Substation/Bank-Level Constraints – **Progress made in Stage 3.1**
  - Forecasted Hosting Capacity

- **Important 4.0 – 4.4**
  - Increased Analysis Refresh Rate
  - Circuit Equipment Ratings
  - Hosting Capacity - Data Validation Efforts – **Progress made in Stage 3.1**
  - Dynamic Hosting Capacity



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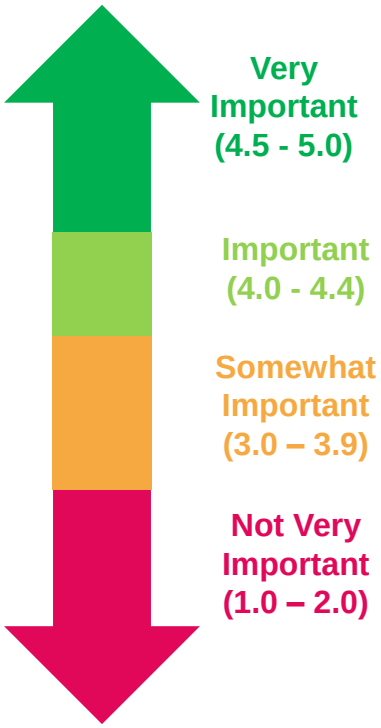
Stage 3.X Survey Prioritization (2/2)

- **Stakeholders were asked to rate the level of importance of each of the following proposed enhancements to your business, using a five-point scale where 1 is "not at all important," and 5 is "very important."**

- **Mid 3.0 – 3.9**
  - Better Communication of Available Reference Materials and Supporting Documentation – **Progress made in Stage 3.1**
  - Time-Varying Hosting Capacity (increased temporal granularity)
  - Hosting Capacity Analysis Criteria Violation Transparency
  - EPRI DRIVE Utility Inputs, Analyses Used, and Study Parameters Transparency – **Progress made in Stage 3.1**

- **Low 1.0 – 2.9**
  - Hosting Capacity for Electric Vehicles*
  - Hosting Capacity for Combined Heat & Power**



*Survey did not include EV stakeholders

**Survey did not include CHP advocates

Future Enhancements

Possible Near-to-Medium Term Enhancements

Note: *Next analysis refresh to be completed by Oct. 1, 2020*

- The JU are highlighting the following enhancements for stakeholder feedback on prioritization, sequencing, and timing following the Oct. 1, refresh.
- Each require utility resources impacting development timelines, future updates, analysis refresh frequency, and the ability to implement multiple enhancements at once.
  - **Additional Map Functionality –** Providing URLs for third party access. Aligns with an existing use case (Scenic Hudson) and has laid the groundwork to provide a similar level of access to other interested parties.
  - **Load Capacity Maps –** A separate display/layer focused on a load-based hosting capacity analysis, could serve as the basis for future analyses or displays specific to other technologies such as energy storage or EVs.
  - **Increased Analysis Refresh Rate** – More frequent analysis updates for circuits experiencing significant changes.

Requested Downloadability / Filterability Functionality

- Concerns with security, accuracy and utility policy on sharing downloadable geographic data with attributes, continues to create significant challenges with some data formats or approaches.
- The JU have been working with Scenic Hudson to share hosting capacity displays that can be overlaid with their own public maps, also aligned with the developer guide use case.
- The live link URL approach provides benefits such as:
  - Previously used by O&R with NJ DEP
  - Does not require significant changes from a resources and data access perspective
  - Addresses utility concerns with security, accuracy and downloadability
  - Allows for a potentially significant value add to stakeholders when combined with the downloadable .csv attribute table summary files

Load Capacity Maps

- Similar to the existing solar PV hosting capacity use case, load capacity maps can guide developers to reasonable sites energy storage or DCFC installations.
- Consistent with improvements in Hosting Capacity Maps, load capacity maps will include a similar roadmap to future releases.
- Many challenges still exist with load capacity maps relative to the current hosting capacity maps e.g. lack of a similar queue for incremental load
- The Joint Utilities are committed to developing and posting load serving capacity maps and are encouraging stakeholder feedback as part of that process.

Increasing Analysis Refresh Rate

- Initial proposals for increase analysis refresh rates would focus on circuits experience significant changes
- The hosting capacity maps will be updated every 6 months in-between the annual refresh, for areas that have received a total increase of connected DG above 500 kW over the prior 6 months.
- Any increase in analysis frequency should also consider impacts to time and resources required to provide other roadmap enhancements
- The next analysis refresh is to be completed by Oct. 1, 2020

Items to Continue Discussing for Potential 3.X Releases

- The JU noted the following items as longer-term items to continue to consider in the context of the broader hosting capacity roadmap:
  - Hosting Capacity for Hybrid Solar + Storage
  - Upstream Substation/Bank-Level Constraints – **Progress made in Stage 3.1**
  - Forecasted Hosting Capacity
  - Circuit Equipment Ratings
  - Hosting Capacity - Data Validation Efforts – **Progress made in Stage 3.1**
  - Dynamic Hosting Capacity

- The JU will plan to address the potential timing of the longer-term enhancements by the November 2020 stakeholder engagement meeting.

Appendix

Substation 3V0 Protection Thresholds in Stage 3.1

- For a single bank station, the 3V0 criteria is 2/3 of light load on the transformer minus the most heavily loaded feeder. The DG connected and in Queue are subtracted.
- For multi-bank stations with an open bus tie, N-1 calculations are completed at both the bank and transformer level to determine the worst-case scenario of the two. The DG connected and in Queue are subtracted in both cases.
  - The bank level N-1 calculation removes the heaviest loaded feeder.
  - The transformer level N-1 calculation removes the heaviest loaded transformer.
- For multi-bank stations with a closed bus tie, only the heaviest loaded feeder is removed for the N-1 scenario to determine the substation 3V0 threshold. The DG connected and in Queue are subtracted.
- The substation 3V0 protection threshold value is expected to be updated monthly to reflect updated total connected and queued DG values. (Utilities can exercise discretion on the actual approach to accomplish this if it just needs to be a standard JU message)
- Substations where the calculation provides a 0 or negative value and additional note can be added as necessary e.g. “0” or “3V0 Protection Pending”.

Meeting Notes

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Substation data availability and downloadability in the attribute tables	• Stakeholders agreed feeder level attribute table is higher priority but noted substation level data is also a valuable and high priority item. • The JU agreed to follow-up with an answer on adding substation data to the attribute tables after meeting internally on the request.	The Joint Utilities agree substation level data in the attribute tables is valuable and are now working to provide that as a common item across utilities.
Substation locations	• Stakeholders raised that some utilities are not displaying substation locations and requested great clarification on that position.	Utilities not currently displaying substation locations are reviewing that position and if company policies will allow for that data to be made available.

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Additional Map Functionality	• Stakeholders requested greater clarification on the live link URL approach, and if it would provide the same level of access as other jurisdictions with API access, e.g. shape files. • The JU confirmed with stakeholders that the live link URL would allow stakeholder to complete their own queries and filtering when overlaid within their own GIS platforms.	The JU agreed to queue the question of rest API access for further discussion in internal meetings, and follow-up with more information on the live link URL approach to stakeholders.

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Load Capacity Maps	• Stakeholder requested more information on the timing of releasing load capacity maps and requested a similar table for solar PV on analysis assumptions and criteria be provided for the load capacity map.	The JU agreed to providing a similar level of reference material when the displays are released.
	• Stakeholders agreed load capacity maps are a major feature to be added, but suggested the JU also consider real estate developers in their outreach, e.g. where to cite loads and buildings.	Similar to solar PV maps, the JU will be trying to align as much as possible, noting any differences in that approach included in the reference materials.
	• The JU noted that this effort is a combined effort between the Hosting Capacity group and the Information Sharing group. In the near-term, the load capacity map would follow a more technology agnostic approach.	The group will work with the Information Sharing group to suggest additional stakeholders as part of the process.
	• The load capacity map is based on the physics of adding any generic load to the distribution system.	The JU will be considering longer term enhancements to the load capacity map i.e. tech specifics, as part of the longer-term roadmap development.

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Increased Analysis Refresh Rate	• Stakeholders suggested circuit change criteria, other than new DG, that could impact hosting capacity, i.e. major changes in load, circuit reconfigurations, also be included for consideration. • Stakeholders raised the question on how the JU reached the proposed six-month timeframe for increasing the analysis refresh rate? • The JU noted that the proposed six-month refresh rate is a first step, and the goal is to continue increasing the analysis refresh rate. However, because as the effort stands today, there are still manual processes involved where it makes more sense from a utility resource perspective to refresh the analyses in larger batches every six months. For example, multiple SMEs need to be involved every update, and it's easier to complete this effort as part of a larger review at a single time. • The JU noted stakeholder preference for the analysis refresh occurring on a monthly basis, as their opinion is a six-month refresh doesn't accomplish the desired goal.	The JU agree other criteria impact hosting capacity, and will review if there are other criteria, like circuit reconfigurations, to include in that determination for significant circuit changes. The JU will continue to note increased analysis refresh as a higher priority item for discussion with stakeholders. Increased refresh rates and associated triggers will be captured in the longer-term roadmap as part of ongoing evolution to increasing refresh rates

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Hosting Capacity for Hybrid Solar + Storage:	• Stakeholders requested clarification on the prioritization of standalone storage vs hybrid solar + storage, as well as on the use of hourly data to accomplish such. Specifically, providing hourly load and generation-based hosting capacity displays the end user could ultimately interpret. • The JU noted that utilities are providing hourly load profiles at the substation; these are useful references, but also understand this not the exact data developers are looking for in the context of hosting capacity.	The JU will note hourly hosting capacity values as part of a longer-term discussion of the roadmap on how to approach hosting capacity for hybrid solar + storage.

May 2020 Stakeholder Webinar Overview

Topic	Discussion Points	Follow-up Items
Hosting Capacity Data Validation Efforts	• Stakeholders raised if there is documentation on data validation efforts utilities could point stakeholders to. • Stakeholders noted the DRIVE validation docs are not provided publicly and that DRIVE accuracy is a related but separate item from JU map accuracy. • The JU noted that many of those questions have already been addressed by EPRI's presentations on the DRIVE tool at previous stakeholder meetings and in the Stage 3.0 reference materials. • The QA/QC effort prior to the release of the displays follows the same level of review as other core utility planning activities.	The JU will frame future data validation discussions to cover both the inputs, i.e. the DRIVE tool and circuit models, as well as how QA/QC of the outputs, i.e. actual hosting capacity values.