

Interconnection Discussion Forum

Q3 2021

Hosted by CPUC Energy Division Interconnection Team

July 21, 2020 | 1:00-4:00 PM

Held virtually via WebEx



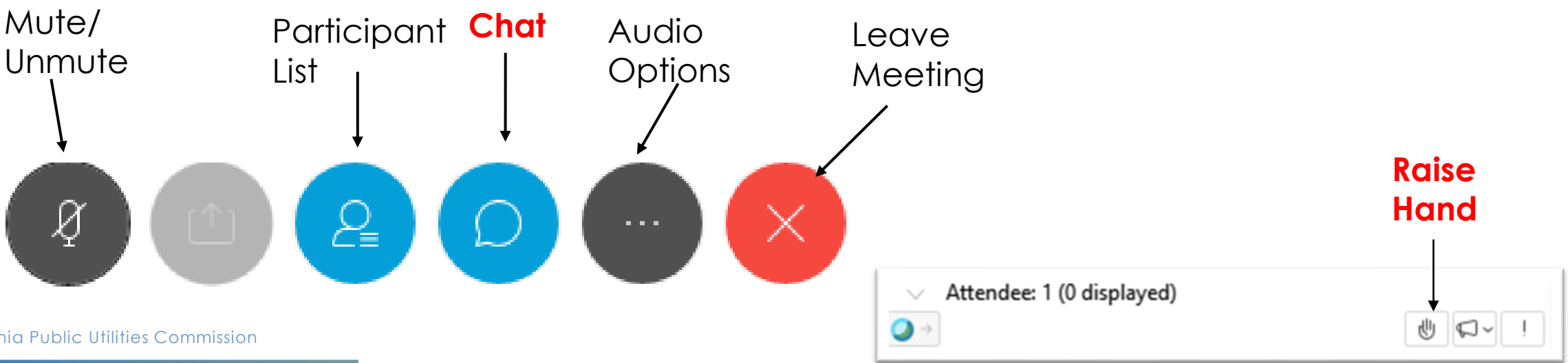
California Public
Utilities Commission

Meeting Logistics

Today's agenda and slides have been distributed to the IDF participant list. If any updates are required after this meeting, they will be distributed again within the week.

All attendees (except panelists) are automatically on Mute.

If you have questions: unmute yourself, send them via **chat directly to Jimmy Mahady (CPUC Regulatory Analyst) or raise your hand.**



Ground rules

Interconnection Discussion Forum is structured to stimulate an honest dialogue and engage different perspectives

Interconnection Discussion Forum is expressly not part of the formal proceeding

Keep discussion respectful

Chat feature is only for Q&A or technical issues. Do not start sidebar conversations with panelists

Agenda

Note: If needed, we can truncate or extend timing below to accommodate for exchange. IDF is intended to be an accommodating, informal opportunity for robust stakeholder discussion.

1:00-1:10 PM – Welcome and Introduction

(Lead Facilitator: Jimmy Mahady, CPUC Energy Division)

1:10 – 1:50 PM – California Independent System Operator Presentation and Group Discussion

(Lead Presenter: Delphine Hou, Director, California Regulatory Affairs)

1:50 – 1:55 PM – Break

1:55 – 2:35 PM – JKB Energy Presentation and Group Discussion

(Lead Presenter: Rich Borba, Director of Policy & Strategy)

2:35 – 2:40 PM – Break

2:40 – 3:00 PM – UL Presentation and Discussion

(Lead Presenter: Tim Zgonena, Principal Engineer)

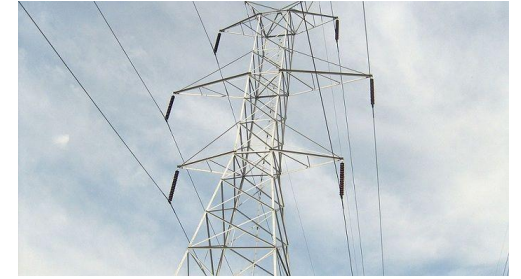
3:00 – 3:30 PM – Group Discussion (Lead Facilitator: Jimmy Mahady, CPUC Energy Division)

3:30-3:35 PM – Wrap up and next steps (Lead Facilitator: Jimmy Mahady, CPUC Energy Division)

R.11-09-011



Distribution v. Transmission Interconnection



Re-opened due to a clause in Rule 21 regarding DER interconnection to the transmission system via Rule 21 (a distribution interconnection tariff) – created by D.12-09-018

- CAISO pointed out the issue on a June 2020 Interconnection Discussion Forum

Rule 21 Tariff Language (PG&E)

B. APPLICABILITY

This Rule describes the Interconnection, operating and Metering requirements for those Generating Facilities to be connected to Distribution Provider's Distribution System and Transmission System over which the California Public Utilities Commission (Commission) has jurisdiction. All Generating Facilities seeking Interconnection with Distribution Provider's Transmission System shall apply to the California Independent System Operator (CAISO) for Interconnection and be subject to CAISO Tariff except for 1) Net Energy Metering Generating Facilities and 2) Generating Facilities that do not export to the grid or sell any exports sent to the grid (Non-Export Generating Facilities). NEM Generating Facilities and Non-Export Generating Facilities subject to Commission jurisdiction shall interconnect under this Rule regardless of whether they interconnect to Distribution Provider's Distribution or Transmission System. Subject to the requirements of this Rule, Distribution Provider will allow the Interconnection of Generating Facilities with its Distribution or Transmission System.

Generating Facility interconnections to Distribution Provider's Distribution System that are subject to Federal Energy Regulatory Commission (FERC) jurisdiction shall apply under Distribution Provider's Wholesale Distribution Tariff (WDT) whether they interconnect to Distribution Provider's Distribution or Transmission System.



California ISO

CAISO Presentation on Rule 21 Transmission Interconnection Pathway Considerations

Delphine Hou

Director, California Regulatory Affairs, CAISO

July 21, 2021

Presented to the Interconnection Discussion Forum Q3 2021

Background

- CAISO supports the Commission's ruling to reopen the record of R.11-09-011
- Previously, the CAISO had presented at the June 24, 2020 Rule 21 IDF concerns needing to be addressed for large-scale NEM Rule 21 interconnection projects
 - Needs include advanced interconnection reliability study advisement, prior notification of potential operational impact and operational visibility once the NEM generator is online
- The current use of Rule 21 to interconnect large resources leaves the CAISO as an affected system or a complete non-participant to the interconnection process
 - Even if the CAISO is notified, it is unclear what the CAISO can require of the resource because it is likely non-jurisdictional to the CAISO
- Therefore, large generators interconnecting under Rule 21 and participating under NEM tariffs can raise significant reliability issues

Further analyzing the issues

- **Definitions matter** - “distributed energy resources” are in some instances interconnecting to the transmission system, not the distribution grid.
- **Full calendar year billing period masks transmission grid impact** - CAISO has observed that recent projects are very large solar PV arrays co-located with smaller loads. Over the year, this may net out but during the day the generation can significantly exceed onsite demand, causing the generator to export large amounts of energy every day from sunrise to sunset.
- **No visibility** - CAISO has no forecasting, telemetry, or metering regarding the operation of these resources or a legal/operational contact point, especially during reliability events.

Proposed resolution

- The Commission should require generation capable of exporting that is directly interconnected to the CAISO controlled grid to interconnect under the CAISO tariff and participate as wholesale resources.
 - Otherwise, the Commission should consider imposing some additional requirements on all transmission-connected NEM resources.
- For distribution-connected NEM export energy, the CAISO recommends the Commission impose additional requirements if the generation capacity exceeds peak load capacity or causes backfeed power from the distribution grid to the transmission grid (see next page).

Proposed requirements

- Interconnecting utilities include the CAISO as an affected system at the beginning of the interconnection process.
- Developers and utilities provide the following information before synchronization under the CAISO's new resource implementation process, which begins 84 days before commercial operation:
 - Single line-diagram of generation and load,
 - Generator and load PMax and PMin, and
 - Modeling and study assumptions, including short circuit/fault duty, steady state (thermal and voltage) and stability analyses.
- Once operating, resources provide the CAISO with direct real-time telemetry including:
 - Substation Interconnection Circuit Breaker Status (Open/Closed),
 - Generation connectivity status (Online/Offline), and
 - Net energy flow (+/-) at point of interconnection to grid.
- Once operating, intermittent resources provide the CAISO with meteorological data for the CAISO to forecast their output.
- A point of contact that can operate the generator immediately in the event of a reliability issue.

Break

Transmission-Connected NEM Resources Interconnecting Under Rule 21

Rich Borba
Director of Policy & Strategy
JKB Energy

Issues

- Rule 21 tariff vs. CAISO tariff
- Benefits
- Exports
- Rationale

Rule 21 tariff vs. CAISO tariff

- Projects with customer substation include protective devices
- Inverter settings
 - < 50 kV IEEE 1547-2018
 - > 50 kV IOU Interconnection Handbook
- Telemetry
 - IOU's typically require telemetry on projects > 1 MW
 - IOU's not providing to CAISO
- CAISO recommendations
 - Single line diagram,
 - Generator PMax & PMin,
 - Modeling assumptions,
 - Substation Interconnection Circuit breaker status,
 - Gen connectivity status,
 - Net Flow,
 - Metrological data,
 - Point of Contact

Rule 21 vs. CAISO Tariff

- Telemetry
 - Can IOU's & CAISO use same telemetry data?
- Cap lifted but > 1 MW must pay full cost of upgrades
- Rule 21 proven method for NEM
 - Incorporate safety and reliability requirements
 - CAISO recommendations

Benefits

- Ensures ALL customers can self generate
 - Some customers do not have access to distribution grid
- Allows customers to buy-in / participate in CA climate goals
- Entry step towards electrification and storage
- Equity -
 - Projects size necessitate projects in rural areas w/ high poverty and unemployment
 - Provides jobs, local investment
- Potential to reduce new transmission expenditures

Exports

- Non-export minimal if any impact
- Exporting - Invisible to CAISO
- NEM Generator islanding potential during “reliability issue”

Rationale

- NEM access to all customers
 - Customers connected to grid via transmission do not have distribution access
- Initial 1 MW cap
- Cap lifted but > 1 MW must pay full cost of upgrades
- Economic benefits
 - Projects in cities & counties with high poverty rates
 - Pre and post interconnection jobs
- Allows customers to move towards net zero in phases

Wrap up

- Potential to incorporate CAISO recommendations into Rule 21
- How many customers connect via transmission grid
 - How many have substation?
- IF and when do exports become issue?
 - Telemetry?
- Electrification and storage impact on exports
 - Customers have long term plans to embrace CA climate goals
 - Storage, electrification, reliability
 - Exploring microgrids, PSPS events

Thank you.

rich@jkbenergy.com

Rich Borba
Director of Policy & Strategy
JKB Energy

Break

Discussion of UL certification categories for both distribution and transmission applications, especially as they relate to the (still developing) IEEE P2800 standard

Tim Zgonena, Principal Engineer, UL



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Group Discussion

Facilitated by CPUC Energy Division Interconnection Team

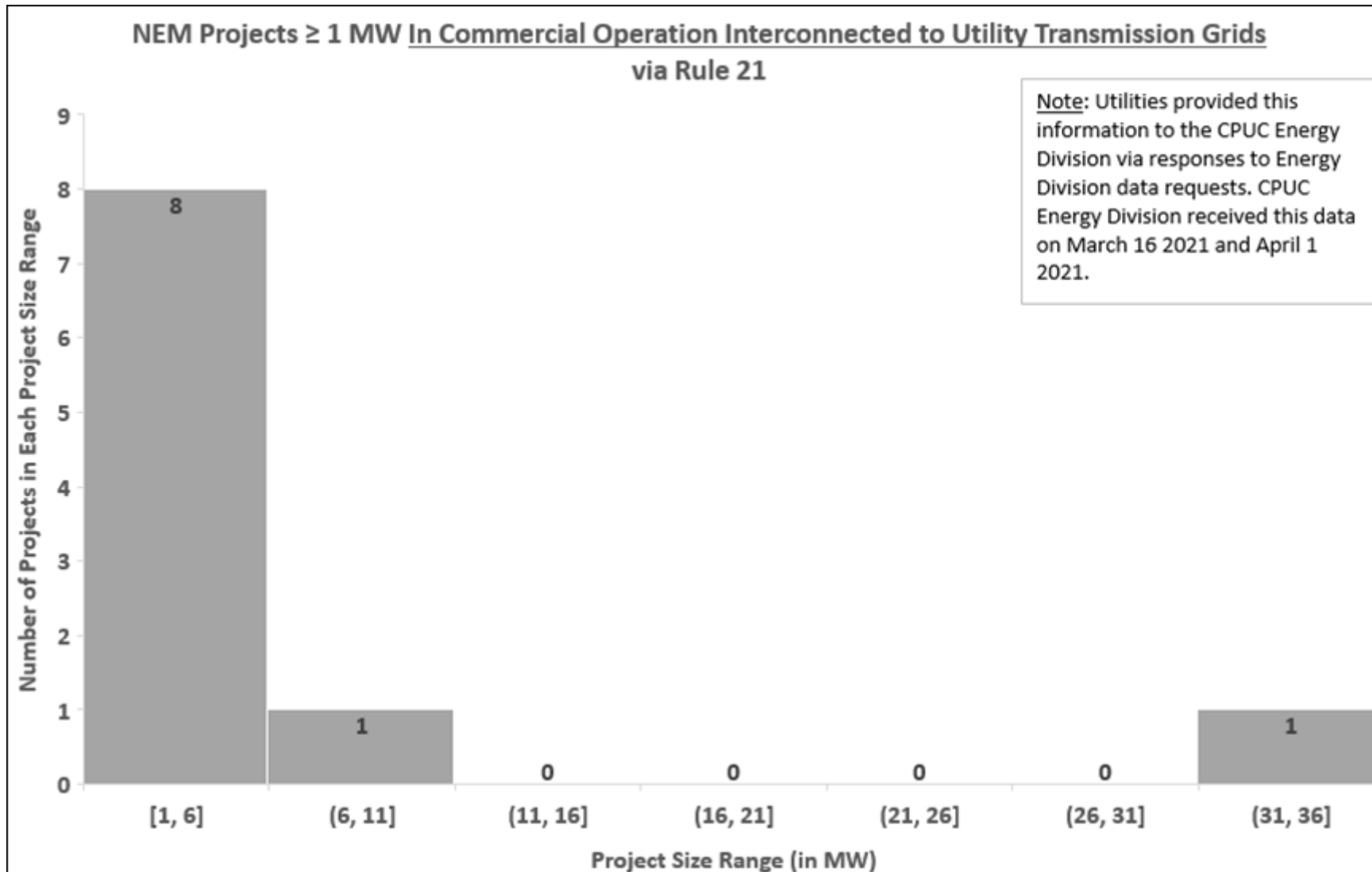


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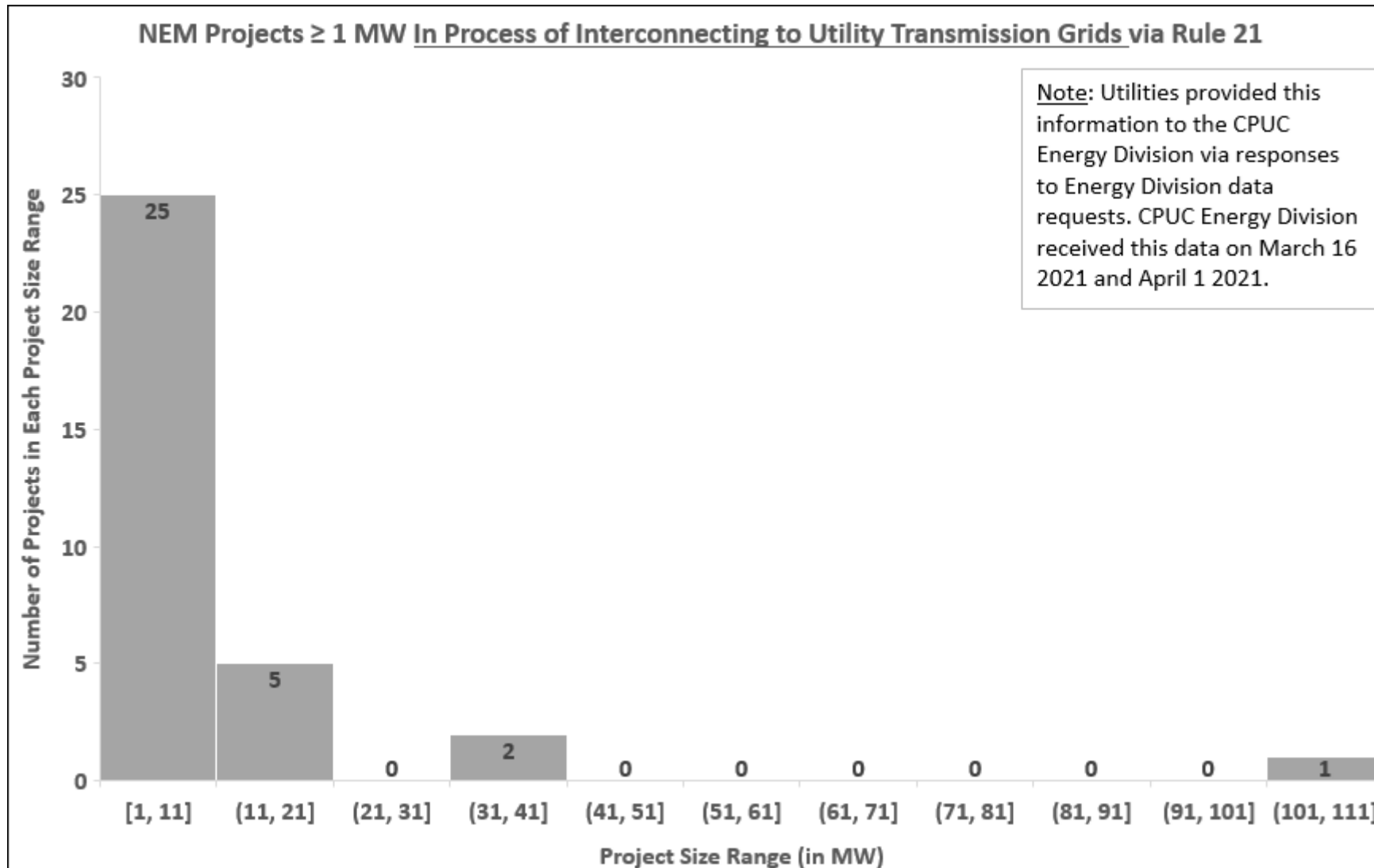
Discussion Question:

If we eliminate transmission interconnection via Rule 21 what is the scale of the impact in terms of the State of California's clean electricity generation, environmental justice and greenhouse gas emissions reductions goals?

Anonymized System Histogram (Interconnected)



Anonymized System Histogram (In-Process)



Discussion Question:

What was/is the rationale for grouping NEM and Non-Export systems under the same structure in R21 Section B.1 from the Ruling Reopening R.11-09-011?

For reference: Rule 21 Tariff Language (PG&E)

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Discussion Question:

What was the initial rationale for allowing transmission interconnection for R21 Settlement Agreement as specified in D.12-09-018?

Wrap up and closing thoughts

Please feel free to share additional feedback and questions with Jimmy.Mahady@cpuc.ca.gov

Thank you!

Please feel free to share additional feedback and questions with Jimmy.Mahady@cpuc.ca.gov