



Attachment 3

Appendix A: Questions for Smart Inverter Operationalization Working Group (SIOWG) Reports

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Smart Inverter Operationalization Working Group Report Questions

Prioritization:

1. The SIOWG Report includes prioritization criteria and stakeholder values that are used to inform the prioritization of the business cases and their associated use cases. Prioritization criteria are found in Section 3.4.1 on pages 25-26. Stakeholder values are found in Table 1 of Section 3.4.1 on pages 26-27.
 - a. Are there any additional prioritization criteria and stakeholder values the Commission could use to determine which business cases to operationalize and what are they and why?
 - b. If yes, based on this prioritization criteria and stakeholder values, which business cases and associated use cases are most important for the Commission to prioritize for operation and why?

Concepts of Firm Export Limits and Non-Firm Export Capacity:

In response to questions 2-5, please include any relevant lessons learned from the Limited Generation Profiles (LGP) regulatory process and record development in the years 2021 through 2023 in Rulemaking R.17-07-007 and through the Advice Letter process (see Figure 3, SIOWG Report at page 18). In response to questions 2-4, please address where relevant the additional primary benefits and challenges of firm export limits and non-firm export capacity and identify which stakeholders these apply to.

2. The following questions are for Business Cases A, B, C, and their associated export-related use cases 1-3 in the report.
 - a. **Business Case A - Operational Flexibility in DER Interconnection-** Should Distribution System Operators (DSOs) be authorized to set firm and non-firm export limits in the interconnection agreement? What criteria should be used to set the non-firm export limits, such as expected full export capacity or export capacity after eventual grid upgrades?
 - b. **Business Case B - Operational Flexibility during Abnormal Conditions-** Should DSO be able to utilize schedule and command capability (automation system) to modify firm export limits under abnormal conditions? What criteria should be used for when and how much the firm export limits could be modified, such as expected heat waves or planned grid reconfigurations?
 - c. **Business Case C - Operational Flexibility for Distribution Services under Normal Conditions-** Should DSOs be authorized to dynamically modify non-firm export limits using schedule and/or command capability (automation system) to DER facilities on an ongoing basis?

- d. **Business Case A - Operational Flexibility in DER Interconnection** Should DSOs be authorized to set minimum export requirements in the interconnection agreement? What criteria (time, duration, amount) should be included?
 - e. **Business Case B - Operational Flexibility during Abnormal Conditions-** Should DSOs be able to utilize schedule and command capability (automation system) to modify minimum export requirements under abnormal conditions?
 - f. **Business Case C - Operational Flexibility for Distribution Services under Normal Conditions-** Should DSOs be authorized to dynamically modify minimum export requirements using schedule and/or command capability (automation system) to DER facilities on an ongoing basis?
 - g. If yes to the questions above, what should be the scheduling structure (e.g., Comma Separated Value (CSV)), interaction (e.g., acknowledgment and error handling), and granularity level (e.g., monthly, weekly, daily, hourly, or others)?
3. Under what conditions, if any, should an interconnection agreement be updated to modify firm export limits and/or non-firm export capacity?
 - a. For example, following a distribution circuit capacity upgrade, permanent circuit reconfiguration, or when the distribution system's capacity decreases to a level where non-firm export capacity is no longer available.
 4. Should firm and non-firm export agreements be extended to DER owners with existing interconnection agreements? If so, how?

Concept of Firm Import Limits and Non-Firm Import Capacity:

In responses to questions 5-8, please address what the additional primary benefits and challenges of firm import limits and non-firm import capacity are and for which stakeholders these apply to.

5. The following questions are for Business Cases A, B, C, and their associated import-related Use Case 4 in the report. A Business Case and Use Case matrix is available in Appendix A.
 - a. **Business Case A - Operational Flexibility in DER Limited Load Profiles** - Should Distribution System Operators (DSOs) be authorized to set firm and non-firm import limits in the connection agreement? What criteria should be used to set the non-firm import limits, such as overall import needs even if some time periods are constrained by firm import limits, or the expected import capacity after eventual grid upgrades?
 - b. **Business Case B - Operational Flexibility during Abnormal Conditions**, Should DSOs be able to utilize schedule and command capability (automation) to modify firm import limits under abnormal conditions? What criteria should be used for when and how much the firm import limits could be modified, such as expected heat waves or planned grid reconfigurations?
 - c. **Business Case C - Operational Flexibility for Distribution Services under Normal Conditions-** Should DSOs be authorized to dynamically modify non-firm import

limits using schedule and/or command capability (automation system) to DER facilities on an ongoing basis?

- d. **Business Case A - Operational Flexibility in DER Limited Load Profiles** - Should DSOs be authorized to set minimum import requirements in the interconnection agreement? What criteria (time, duration, amount) should be included?
 - e. **Business Case B - Operational Flexibility during Abnormal Conditions**- Should DSOs be able to utilize schedule and command capability (automation system) to modify minimum import requirements under abnormal conditions?
 - f. **Business Case C - Operational Flexibility for Distribution Services under Normal Conditions**- Should DSOs be authorized to dynamically modify minimum import requirements using schedule and/or command capability (automation system) to DER facilities on an ongoing basis?
 - g. If yes to the questions above, what should be the scheduling structure (e.g., CSV), interaction (e.g., acknowledgment and error handling), and granularity level (e.g., monthly, weekly, daily, hourly, or others)?
6. Regarding the granularity of hourly scheduling values for Power Import Limiting profiles:
 - a. Do you view 288 hourly values spread across three possible configurations ("24-hourly," "Block," and "18-23-fixed"), as described in Resolution E-5296 regarding Limited Generation Profiles, as an adequate symmetrical construct on the load side?
 - b. If not, do you believe a different number of hours and structure(s) should be used for scheduling Power Import Limiting profiles?
 7. Under what conditions, if any, should a Service Agreement be updated to modify firm import limits and/or non-firm import capacity?
 - a. For example, following a distribution circuit capacity upgrade, permanent circuit reconfiguration, or when the distribution system's capacity decreases to a level where non-firm import capacity is no longer available.
 8. The report uses the term "Limited Load Profiles" to describe the agreement for energization. Are there any suggested alternative terms to describe providing energy and service agreements to customers?

Concepts of Non-Firm Capacity

9. Non-firm export and import capacity is not guaranteed and may not always be available, for example, if distribution capacity is not available due to grid conditions.
 - a. What criteria should DSOs and DER owners use to identify non-firm capacity to ensure a realistic and fair estimated quantity (kW) is provided in the agreement?
 - b. Once DER facilities are operational, what reasonable terms and conditions should the Commission consider to ensure DSOs authorize the use of non-firm

capacity for stakeholders' benefits when those non-firm limits are not needed for grid safety and reliability?

EV (Business Case E):

10. Regarding any initial efforts to deploy EV charging projects through flexible connection agreements:
 - a. How many EV charging sites (including capacity), that are either operational or under development, are piloting or using a form of flexible connection agreement that relies on power import limiting schedules?
 - i. Note: If responses include confidential information, please include a redacted and non-redacted version.
 - b. For sites as described in 12(a), how is PG&E, SCE, and SDG&E differentiating between firm and non-firm levels of energization and / or export from a contractual and operational standpoint?
 - c. What is the preferred temporal granularity for power import limiting and/or power export limiting schedules?
 - d. What communication pathways or protocols, if any, are required for the DSOs to communicate with and send commands to the EVSE at EV charging sites?

Regulatory Issues:

11. Which regulatory proceedings (existing or new) should address these recommended capabilities for generation limiting with non-firm **export** capacity? (Note: The IOUs' Rule 21 tariffs currently address firm export limits).
12. Which regulatory proceedings (existing or new) should address these recommended capabilities for load limiting with firm **import** limits and non-firm import capacity?
13. What regulatory requirements would need to be defined to provide operational guidelines on the **fair allocation** of non-firm capacity to different DER facilities? What issues would need to be resolved?
14. How should regulations and tariffs for export and import limits be designed for DERs that have both load and generation attributes, such as stand-alone battery storage, PV-paired storage, and bidirectional EV charging? Should power import and export issues be addressed in separate rulemakings working in parallel, or should they be combined into a single rulemaking?
15. Annex B briefly addresses the handling of **unused capacity**. What issues do you see related to managing customer unused capacity? What, if anything, should the Commission do relative to unused capacity? Should this be addressed in the IOUs' tariffs?
16. What existing standards (such as technical, safety, testing, and operational) should the Commission consider referencing in developing rules and regulations for Business Cases

and Use Cases in the report? What new standards will be needed to inform CPUC regulation and policy?

Technical Requirements:

17. Questions 17a-17d discuss technical requirements and timelines that DSOs may need to develop or modify to support the management of firm limits and non-firm capacity and its inclusion in grid operations and planning. These areas include the following: Geographic Information System (GIS), Integration Capacity Analysis (ICA), Advanced Distribution Management Systems (ADMS), Distributed Energy Resources Management System (DERMS), power flow applications, and communications,
- a. For DSOs: Section 5.5 discusses the technical issues for DSOs implementing Use Cases 1-3, while Section 11.7 (Table 19) includes estimated deployment timelines. What would be your Use Case 1-3 technology roadmap(s) for implementing the necessary ADMS/DERMS power flow assessment applications required by Section 5.5? What actions could the Commission, DSOs, and other actors take to meet or accelerate the roadmap(s) timeline?
 - b. For DSOs: What would be your Use Case 4 (import limiting) technology roadmap(s) for the same implementation issues? What are the differences in meeting the Use Case 4 technical requirements compared to Use Cases 1-3? What actions could the Commission, DSOs, and other actors take to meet or accelerate the roadmap(s) timeline?
 - c. For all: What communication capabilities and protocols are needed for DSOs and DER aggregators to implement monitoring, scheduling, and commands in the Uses Cases 1-4? See sections 5 and 6 in the SIOWG Report.
 - d. For DSOs: Which situational awareness scenarios (performance timeline) described in Table 10, Section 5.5.3 on page 73 are included in your technology roadmap(s), for which Use Cases 1-4, and why? What actions could the CPUC, DSOs, and other actors take to meet or accelerate the roadmap(s) timeline about situational awareness scenarios?
18. What technical, procedural, and regulatory requirements are necessary for testing and certification to reflect the new scheduling and command requirements supported by power control systems for firm and non-firm capacity management proposed in Section 5.5 on pages 71-79, Sections 11.1 -11.7 on pages 112-120, and Annex C on pages 131-135?
- a. What testing standards, for example Underwriters Laboratories (UL) 3141, are being developed or need to be developed that may affect the implementation of firm/non-firm capacity limits?
 - b. What is the timeline for developing these testing and certification requirements and which entities are addressing it?

Smart Inverter Operationalization Cybersecurity Subgroup Report Questions

Cybersecurity Requirements:

19. Do you agree with the Commission establishing Paths F, G, and H based on SIO-CS prioritization? If yes, why? If not, why not?
 - a. Please verify if any challenges could arise while running the prioritized parallel paths F, G, and H in parallel. Specifically, are there any timing constraints or internal prioritization conflicts that could hinder the desired parallel implementation of the pathways?
 - b. Do you agree with SIO-CS Working Group recommendation that the Commission Should not pursue Paths A, B, C, D, and E? Explain your reasoning.

20. Questions related to Path F (**Recommend that DSOs use the SIO-CS Phase 1 Primary DER Cybersecurity Requirements in the short term as part of their cybersecurity requirements for DER facilities**):
 - a. Following the publication of DOE/NARUC Cybersecurity baseline recommendations in February 2024, should Path F **require** DSOs to include the Phase 1 Primary DER Cybersecurity Requirements instead of just **recommending** their inclusion?
 - b. If Path F is required, should it apply to DERs less than 1 MW or some other size threshold?
 - c. What existing DER cybersecurity requirements do Utilities (DSOs) have and what challenges could they face in implementing the SIO-CS Phase 1 DER Cybersecurity Requirements in Annex A with their existing requirements?
 - d. Which implementation pathways should be taken for the SIO-CS Phase 1 DER cybersecurity requirements?

21. Questions related to Path G (**Initiate the development of Phase 2 DER Cybersecurity Requirements based on SIO-CS Phase 1**):
 - a. The DOE/NARUC document titled "*Cybersecurity Baselines for Electric Distribution and DER*" indicates that regulatory bodies should utilize it to establish cybersecurity requirements for their respective jurisdictions. Should the Commission take the initiative to encourage the development of updated cybersecurity requirements for DER in California based on the Path G process, which involves using the DOE/NARUC baselines and incorporating feedback into the Phase 1 DER Cybersecurity Requirements from UL, SunSpec, IEEE, utilities, and cybersecurity experts?
 - b. UL, SunSpec, and IEEE are undertaking the development of cybersecurity requirements within their different but overlapping domains, potentially resulting in similar but not identical requirements. Should (and how could) the Commission through Path G take the lead in coordinating these efforts?
 - c. Should Path G also be used to periodically revise and develop new cybersecurity requirements in response to evolving cyber threats?

22. Questions related to Path H (**Endorse the establishment of testing and certification programs**):

- a. What is the role of the Commission in coordinating with third-party cybersecurity certification programs like the ones being developed by SunSpec and UL?
- b. Should this process be the same as the Commission's development of Rule 21 requirements and subsequent certification programs by UL 1741 SA? For Rule 21, the Commission set timelines for the development of testing and certification programs and the timeframe for DER compliance with those programs. What timelines should the Commission propose for coordination with third-party cybersecurity certification programs?
- c. What requirements are necessary for cybersecurity testing and certification of DER equipment, as opposed to attestation for supply chain and bill of materials threats?
- d. UL and SunSpec are currently focused on testing the cybersecurity of individual DER equipment. What other cybersecurity requirements would DSOs like to see in a testing and certification program, such as gateways, communications, and Power Control Systems?
- e. What is the role of DER unit testing by manufacturers vs. on-site field testing by DER integrators in DER cybersecurity requirements?

Appendix B: SIOWG Business Cases and Use Cases Matrix

	Use Case 1. Scheduled Maximum Export Limit	Use Case 2. Commanded Maximum Export Limit	Use Case 3. Generation Minimum Export Requireme nt	Use Case 4. Import Limits (Scheduled, Commanded, Minimum)
Business Case A: Operational Flexibility in DER Interconnection or Limited Load Profiles	Use Case A1: Inclusion of Firm Export Limits and Non-Firm Export capacity for scheduling maximum export limits in Interconnection Agreements	Use Case A2: Inclusion of Firm Export Limits and Non-Firm Export capacity for commanding maximum export limits in Interconnection Agreements	Use Case A3: Generation Export Minimum Requirement in Interconnection Agreements	Use Case A4: Firm Import Limits and Non-Firm Import (Load) Capacity in Limited Load Profiles
Business Case B: Operational Flexibility during Abnormal Conditions	Use Case B1: Scheduled Firm Export Limits and Non-Firm Export Capacity Before or During Abnormal Conditions	Use Case B2: Commanded Firm Export Limits and Non-Firm Export Capacity for Abnormal Conditions	Use Case B3: Minimum Generation Export Requirement for Abnormal Conditions	Use Case B4: Firm Import Limits and Non-Firm Import (Load) Capacity Before or During Abnormal Conditions
Business Case C: Operational Flexibility for Distribution Services under Normal Conditions	Use Case C1: Scheduled Firm Export Limits and Non-Firm Export Capacity for Distribution Services	Use Case C2: Commanded Firm Export Limits and Non-Firm Export Capacity for Distribution Services	Use Case C3: Minimum Generation Export Requirement for Distribution Services	Use Case C4: Firm and Non-Firm Import (Load) Limits for Distribution Services