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Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future.	Rulemaking 21-06-017 (Filed July 2, 2021)

ENVIRONMENTAL DEFENSE FUND OPENING COMMENTS ON ASSIGNED COMMISSIONER'S RULING SEEKING ADDITIONAL INFORMATION ON DER ENABLED NEAR TERM FLEXIBLE CONNECTIONS

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I. INTRODUCTION

Pursuant to the Assigned Commissioner's Ruling Seeking Additional Information on DER Enabled Near Term Flexible Connections, filed November 3, 2025, in Docket R.21-06-017 ("Commissioner's Ruling"), as modified by the Email Ruling Modifying Party Response Date, filed November 19, 2025, Environmental Defense Fund ("EDF") respectfully files these Opening Comments.[1]

EDF continues to believe that enabling flexible service connections ("FSCs") for all customers, including dynamic flexible FSCs, should be a central focus for the Commission as it works to enable timely interconnection, promote more efficient grid utilization, and put downward pressure on utility rates. In particular, EDF recommends that the Commission prioritize implementing a range of FSC options in addition to dynamic approaches, so as to address different customer use cases. EDF also encourages adapting or modifying existing rules and tariffs to support these strategies, with the understanding that customer compensation mechanisms will also be necessary in the future. Below, EDF provides more detailed responses to a subset of the Commissioner's Ruling questions.

II. RESPONSES TO QUESTIONS

16. Does the value provided by the ability to signal maximum import values via IEEE 2030.5 to sites on the polyphase grid during emergent abnormal grid operation justify the technical and contractual effort necessary to develop this ability?

Yes. Under the right circumstances, investing in grid flexibility through communications-based solutions represents a sound strategy from both technical and contractual perspectives, and can deliver near- and long-term system resilience, operational flexibility, and customer value. FSCs, for example, allow utilities to actively manage load, optimize existing infrastructure, and potentially avoid costly and time-consuming infrastructure upgrades. This approach is especially valuable for larger customers—such as EV fleet charging depots—which often exceed one megawatt of demand and are more likely to justify the associated costs. Moreover, PG&E has explicitly acknowledged that pursuing this capability can be cost-effective while emphasizing the

[1] Docket R.21-06-017, *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*, Assigned Commissioner's Ruling Seeking Additional Information on DER Enabled Near Term Flexible Connections (Nov. 3, 2025); Docket R.21-06-017, *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future*, Email Ruling Modifying Party Response Data (Nov. 19, 2025). [hereinafter "High DER Proceeding"].

importance of implementing such strategies only where they make sense.[2]

As utilities deploy technologies that enable the capture and coordination of DERs—including rooftop solar, battery storage, and EVs—they can adopt orchestration platforms that unlock flexibility at scale. Moreover, signaling maximum import values via IEEE 2030.5 or some other active communications pathway can allow utilities to safely and proactively manage load at individual sites or aggregated portfolios, reducing strain during contingencies, maintenance events, or forecasted peaks. This capability can support more precise operations than static load limits, improving system reliability and operational efficiency. Given the pace of technological advancement, proactively integrating flexible, technology-agnostic platforms allows utilities to adapt to changing grid conditions and emerging customer needs, creating future-proof investments that expand system flexibility precisely when it is most needed.

Polyphase sites that can support higher loads are particularly well-suited for testing or deploying flexible connection programs, including signaling maximum import/export limits or implementing dynamic load limits. This is particularly true when utilities are already investing in the necessary grid visibility and communications infrastructure to serve other system needs, and enabling FSCs represents one benefit among many. Critically, the value of these investments is fully realized only when utilities incorporate assumptions about available flexibility into their grid planning and interconnection processes. By doing so, utilities can avoid or defer costly and time-consuming infrastructure upgrades that would otherwise be triggered, because the additional firm capacity is no longer required. Over time, this approach enables the grid to operate more efficiently, deliver meaningful customer value, and respond dynamically to changing system conditions—ultimately supporting a more flexible, resilient, and future-proof distribution grid.

Customer deployment of DERs and load flexibility are expected to continue growing in the coming years as adoption accelerates and technology costs decline.[3] Accordingly, even if the CPUC determines that current costs exceed near-term benefits, it should account for long-term cost-effectiveness as these deployments are likely to grow faster than the utility costs to serve them. This capability can support more precise operations than static load limits, improving system reliability and operational efficiency. Market trends are expected to improve FSC cost-benefit

[2] High DER Proceeding, PG&E Responses to Assigned Commissioner's Ruling Seeking Additional Information on DER Enabled Near Term Flexible Connections at 8-9 (November 25, 2025).
[3] *See generally* High DER Proceeding, PG&E, SCE, and SDG&E Draft Electrification Impact Studies Part 2 (Oct. 31, 2025).

performance over time; DERs and flexible capabilities will continue to grow in scale and sophistication, while the cost of enabling technologies for communications, integration, and control are likely to decline as standards mature and deployment scales.[4] While implementation requires upfront investment, coordination, and clear frameworks, the long-term gains in operational flexibility, DER visibility, and alignment between customer-side resources and grid needs make this a cost-effective and strategic investment when deployed prudently, ultimately enabling a resilient, efficient, and future-ready grid.

16(c). How could such customer import direction be developed and implemented to maximize value and produce significant net benefit to the system?

Implementing and expanding flexible interconnection programs—starting with straightforward, simple, easily-implemented solutions—represents a clear, low-risk, high-reward strategy that delivers tangible benefits for both customers and the grid.[5] For example, programs like SCE's LCMS Pilot[6] can be implemented by most utilities with minimal upfront investment, providing an immediate pathway to improved system flexibility, reliability, and ratepayer affordability. An essential component of these programs is customer choice. Customers should have options for flexible service connections, with utilities clearly presenting the costs, benefits, and potential trade-offs associated with each option. Over time, utilities can build on these programs by incorporating more sophisticated operational capabilities, as discussed further below in response to question 20. In presenting options to customers, utilities should clearly detail the specific constraint conditions such as timing and magnitude of the constraints, and the resulting customer impacts such as energization timelines and available compensation mechanisms for each option. Dynamic, communications-based options are likely to have the greatest net benefit to the system as they are based on directly measured grid conditions, but may be overly restrictive for certain customers. By giving customers multiple options, utilities can maximize the total benefits through maximizing participation.

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[4] *See, e.g.*, Energy + Environmental Economics, *Unlocking the Value of Smart Panels: The Benefits of a Utility Ownership Model for Smart Electric Panels* (Aug. 2025) (case study demonstrating long-term utility-level benefits and avoided secondary distribution costs from smart panel investments), *available at* https://www.ethree.com/wp-content/uploads/2025/08/E3_Unlocking-the-Value-of-Smart-Panels_August-2025.pdf

[5] Casey Horan et al., *Let's Get Flexible: Considerations for Unlocking Grid Capacity Using Flexible Interconnection* at 4 (Environmental Defense Fund, Feb. 2025), *available at* https://library.edf.org/AssetLink/q812pd5afr3hboi61cm503fprla5ge0p.pdf

[6] SCE's LCMS operates independently without real-time external communication, using pre-programmed limits to manage power usage. SCE, Establishment of Southern California Edison Company's Customer-Side, Third Party Owned, Automated Load Control Management Systems Pilot (Advice Letter 5138-E and 5138-E-A) (Jan. 2023).

18.Should Rules, Tariffs, or policies be modified in order to allow for operator signaled maximum import capacity limits under abnormal grid operation?

Yes. As noted above, existing rules and tariff provisions (e.g., Rules 15, 16, 29, and 45) should be adapted to support FSC agreements in both the near- and long-term. Pilot programs and dynamic interconnection agreements, such as those implemented by PG&E and SCE, can serve as valuable testing grounds to refine these frameworks prior to broader adoption. That said, widescale adoption of indefinite flexible connections will require formalized rules and consistent regulatory frameworks to provide predictability and equitable treatment for all customers. Utilities should include in their energization rules language that specifies when customers are eligible for flexible connections and outline the obligations of both utilities and customers under those arrangements. This clarity should apply not only to dynamic options, which are the primary focus of this proceeding, but also to static and scheduled interconnection options.

Over time, utility tariffs should be updated to support more advanced behind-the-meter flexibility. However, certain operational rules should be established sooner rather than later. These rules should define when and how utilities can signal maximum import values under abnormal grid conditions and clearly delineate the responsibilities of both utilities and customers.

Any future tariff updates should also explicitly address compensation and incentives for FSCs. For bridging solutions, compensation structures may or may not be necessary, as the primary value to the customer is faster energization. By contrast, indefinite flexible service connections, in which customers agree to forgo full capacity for an extended period, should include clear financial credits or other forms of compensation to ensure fairness between participating customers and those who opt out.

18(d). If yes, please provide suggestions regarding the specific Rules, Tariffs, or policies, and any suggested modifications.

The specific language in utility tariffs will vary by utility, but any provisions should clearly state that customers have the option to use FSCs for both temporary and indefinite purposes. At the same time, PUC Rules 15, 16, 29, and 45 can be updated to better support flexible interconnection by explicitly incorporating provisions for dynamic flexible service connections alongside traditional flat/static and scheduled options.

Rules 15 and 16, which govern distribution and service line extensions, could be updated to clarify eligibility criteria and application processes for customers seeking FSCs. They could also provide guidance on signaling maximum import/export limits and managing behind-the-meter

resources under abnormal grid conditions as well as compensation mechanisms for indefinite flexibility. Additionally, tariff structures and rate design could provide a framework for financial incentives or credits that recognize the value of voluntary capacity reductions, while ensuring fair treatment for customers who choose to opt out.

Rules 29 and 45, which cover EV infrastructure, could establish standardized terms for flexible arrangements at EV charging stations, including the responsibilities of both utilities and customers. If the Commission considers changes in the future to the utilities' Rule 29/45 policy socializing the cost of utility-side make-ready infrastructure for EV charging customers, it should consider directing the utilities to continue socializing some or all of these costs for customers who agree to a flexible service connection. This could both incentivize greater participation and compensate customers for that participation.

PG&E has also agreed that these rules and tariffs should be updated, noting that to some extent, flexible connection is already available under existing provisions for sites that have voluntarily opted into the utility's DERMS-connected programs (e.g., FlexConnect).[7] PG&E suggested that the Commission may want to consider modifications to Rules or Tariffs to require connection to the IOU's DERMS for specific customer classes that are both flexible and large enough to have a meaningful impact on the grid. EDF disagrees with this recommendation to the extent that it would require a customer to connect to the DERMS system. As explained above and throughout EDF's comments in this proceeding on flexible service connections, the utilities should be offering a menu of options to customers, from simple static connections to complex dynamic options. For some customers, participating in a dynamic connection may be feasible and cost-effective, but this is not necessarily true for all customers, even all large customers. The cost of connecting to a utility's DERMS system may not be justified for all customers and should not be imposed as a uniform requirement.

20.Do parties favor adapting existing approaches (e.g., LLL, FlexConnect) to serve single phase customers, or taking a different approach? g. If parties favor a mix of adaptation and different approaches, please detail which elements (e.g., computing static operating profile, communicating day ahead values, etc.) should be adapted and which should use a different approach.

Utilities should adapt existing approaches and explore a range of FSC options, providing customers with a menu of arrangements to maximize participation and system benefits. At a

[7] High DER Proceeding, PG&E Responses to Assigned Commissioner's Ruling Seeking Additional Information on DER Enabled Near Term Flexible Connections at 9-10 (November 25, 2025).

minimum, these options should include flat and scheduled limits, while continuing to explore dynamic limits options for single phase customers. Providing a spectrum of choices allows customers with greater operational flexibility to access more grid capacity, while those with less flexibility can participate through simpler, easier-to-implement arrangements. This includes single phase customers. Given the diminishing returns to each additional FSC option offered to customers, EDF recommends the utilities focus near-term efforts on providing one option in each of the following three categories and collect data on their use and effectiveness before considering additional options.

Flat (Static) Limits: Flat, or static, FSCs establish a fixed load limit that does not vary over time or in response to real-time grid conditions, similar to the existing LLL. The static operating limit is set when the agreement is executed and remains constant year to year. Flat limits are particularly useful as interim solutions when a utility is planning or constructing upstream upgrades; once these upgrades are complete, limits can be increased to reflect newly available capacity. Often referred to as "ramped" or "phased" connections, these arrangements are already employed across the U.S. through construction service agreements but have not been formally recognized as a tool for accelerating energization timelines.[8] Because flat limits require no real-time communication or advanced controls, they are the simplest and most immediately deployable form of FSC, offering a low-cost, low-complexity option that can quickly alleviate interconnection delays for EV charging and other electric end uses.

Scheduled Limits: Scheduled limits provide firm capacity that varies predictably over the course of a day, month, or season based on the terms of the FSC agreement. These limits can take the form of hourly values, broader time blocks, or other structured schedules that allow for intra-day variations. A notable example is Southern California Edison's LCMS pilot, which uses preset limits without real-time communication; devices are pre-programmed to manage their energy usage automatically. Scheduled limits offer customers greater access to grid capacity during off-peak periods while providing clear, dependable parameters for managing load throughout the year.

Dynamic Limits: Dynamic limits provide non-firm capacity that adjusts throughout the day in response to real-time or forecasted grid conditions. These arrangements allow customer loads to respond to system events or peak demand periods, providing flexibility while maintaining

[8] *See e.g.*, Major Utilities: CenterPoint Houston Electric, PG&E, Los Angeles Department of Water and Power.

grid stability. PG&E's FlexConnect pilot illustrates the successful application of dynamic limits among large charging station developers and stationary battery storage projects by communicating day-ahead forecasts to customers.

Dynamic limits are a more sophisticated approach, offering significant system benefits but requiring greater utility visibility and operational capabilities. In the near-term, dynamic options may be lower priority for the utilities with respect to single phase customers as the cost of hardware and software necessary to offer dynamic limits may not be justified for these smaller customers. But additional information is necessary regarding the distribution of customers across the utilities' polyphase and single phase circuits before the Commission makes a decision on this. The Commission and utilities should focus on enabling static and scheduled agreements for single phase customers for now, and should collect further information from the utilities on the scale of the need for dynamic options for single phase customers and the additional cost of DERMS and other infrastructure necessary to make this option available.

23. Should the Commission pursue non-bridging flexible connections as a way for single phase customers to avoid or defer grid upgrades? Please provide details as to how this could be implemented.

Yes. Non-bridging solutions, or (indefinite) FSC agreements, can be well-suited for single phase customers who are willing to remain on constrained capacity limits permanently, or at least until they seek an alternative arrangement from the utility. Though generally lower demand than polyphase customers, single phase customers can still have the DERs (including EVs and distributed storage) that allow them to be flexible in their demand and abide by flexible service connection agreement. These long-term options can provide meaningful certainty for both utilities and customers, optimize the use of existing assets, and help support a more efficient and adaptable grid as electrification—including EV charging—continues to grow. That said, indefinite arrangements will require consideration of potential mechanisms to compensate customers for voluntarily limiting their load.

24.What current models or methodologies (e.g., AusNet Approximation algorithm, Asset Capacity Operating Envelopes, LV network approximation with AMI data, etc.) have the potential to provide low-cost static or variable operating envelopes for the purpose of minimizing or deferring distribution line or service upgrades on single phase feeders?

A static operating envelope methodology can be implemented by adapting standard capacity analyses to determine how much capacity is available on a given circuit. Using routine engineering analyses, utilities can quantify the available capacity and offer that amount to the

customer under a static operating envelope. Moreover, PG&E has noted that it is exploring a pathway to this approach through AMI 2.0 meters and edge computing and expects to provide additional details in the future.[9] This demonstrates that utilities already recognize these technologies as potentially valuable tools for minimizing distribution upgrades.

27.Should Rules, Tariffs, or policies be modified in order to allow for the implementation of static or variable operational envelopes for single phase customers?

Yes. For the same reasons discussed above in response to question 18, EDF recommends the Commission direct the utilities to modify their rules related to energization (Rules 15, 16, and 29/45) to set clear customer and utility obligations related to flexible service connections. And, the utilities should develop compensation mechanisms for customers who opt for indefinite agreements, and detail those mechanisms in their tariffs.

28.Should existing and new customers utilizing variable or dynamic operating envelopes be required to enroll in dynamic rate pilots, when available in their territory, and then be defaulted to dynamic rates when the pilots are no longer available? Please provide rationale for your response.

Participating customers should continue to have access to the same tariff options as similarly situated non-participating customers. Importantly, a dynamic rate is not required to influence a participating customer's local grid impact, as they are already managing it through participation in the flexible service connection. Nonetheless, there may still be value in influencing that customer's effect on upstream grid infrastructure and generation, which is a consideration that applies to all customers, whether or not they participate in a flexible agreement.

Eventually, the Commission may determine that customers—both those participating in flexible service connections and those not—should be defaulted to dynamic rates. Over time, this could maximize the long-term benefits of FSCs—such as enhanced grid resilience and deferred and/or avoided upstream infrastructure investments—supporting more cost-effective system planning and helping to mitigate potential rate increases.

III. CONCLUSION

EDF thanks the Commission for the opportunity to provide these Opening Comments.

Respectfully submitted,

[9] High DER Proceeding, PG&E Responses to Assigned Commissioner's Ruling Seeking Additional Information on DER Enabled Near Term Flexible Connections at 11 (November 25, 2025).

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