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Generac Power Systems, Inc RFI Response

Additional submitted attachment is included below.

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November 30, 2022

California Energy Commission
Docket Unit, MS-4
715 P Street
Sacramento, CA
Via docket submission

Re: Docket No. 21-ESR-01 Comments of Generac Power Systems, Inc. to the Request for Information: Clean Energy Resources for Reliability issued Nov. 7, 2022

Commissioners and Staff:

Generac Power Systems, Inc. (Generac) appreciates the opportunity to respond to the California Energy Commission (CEC)'s Request for Information. Generac offers the following comments in response to the CEC's Request for Information (RFI) seeking input on the CEC's development of a Clean Energy Reliability Investment Plan (CERIP), evaluation of existing and developing resources to meet energy demand and develop a load shifting program (SB 846), and creation of the Distributed Electricity Backup Assets Program (DEBA) (AB 205). Our comments focus on how the CEC can accelerate the development of distributed energy resources (DERs) that can support reliability and make better use of existing DERs.

The 2022 legislation is highly significant because it expresses the legislature's intent that California further its progress on DERs and utilizing DERs to support the grid while providing a huge investment to do so. The CEC has an unprecedented opportunity to make ambitious and prudent investment decisions while fostering new DER programs across California and setting an example for the broader market.

As a preliminary matter, the CEC should clearly delineate the relationships between the CERIP, DEBA, and the Demand Side Grid Support program (DSGS), which was also created by AB 205 in 2022. The recent workshop slides and the RFI, because they focus on delineating certain technologies, appear to mix the programs. AB 205 authorizes the CEC to adopt guidelines for the DSGS program and directs the CEC to "adopt guidelines to determine when to implement the program, including which resources are dispatched first to minimize local pollution and emissions of greenhouse gases." (AB 205, §25792(e)). AB 205 created DEBA to "implement the DEBA Program in accordance with Article 2 (commencing with Section 25791)" and authorized the CEC to adopt regulations to implement the chapter. § 25793(b), (e).

In August of 2022, the CEC adopted guidelines for the DSGS program, which "will provide incentives to reduce customer net load during extreme events with upfront capacity commitments

and for per-unit reductions in net load."[1] (Guidelines published August 2022). We are unaware of any regulations created by the CEC so far to implement the DEBA. Given the mixing of the programs in the CEC workshop presentations, and the parallel goals of the two programs, it is unclear how, why, or whether the CEC will proceed in a different direction with DEBA than with the already-adopted DSGS program. Therefore, we recommend that CEC provide clarification on the overlap between the two programs, and whether it intends to follow a similar path for DEBA as for DSGS regulations before further work in this docket.

Company Background

Generac is a leading energy technology solutions company providing advanced power grid software solutions, backup and prime power systems for home and industrial applications, solar + battery storage solutions, ecobee smart thermostats and virtual power plant (VPP) platforms and distributed energy resource management system (DERMS) aggregation and control platforms. Generac has a long history of providing power generation products across a variety of applications and maintains a leading position in the power equipment market in North America, with an expanding presence internationally.

With a commitment to sustainable, cleaner energy products, Generac recently formed an Energy Technology organization focused on supporting the next-generation grid with a comprehensive energy ecosystem comprised of solar and battery storage systems, energy monitoring, smart devices including ecobee thermostats for intelligent energy management, as well as an extensive portfolio of grid services.

Generac offers a wide array of power products suitable as grid-tied distributed energy resources (DER) assets, controllable and dispatchable by way of the ConcertoTM VPP/DERMS software platform. These products include but are not limited to ecobee smart thermostats, PWRcell energy storage systems, load control switches, and CTA-2045 smart water heater modules, among several other smart energy solutions and more traditional backup power systems. Generac offers the technological capability to aggregate and control these systems and products.

CEC Request for Information

The CEC is seeking to identify clean energy resources and characterize their ability to support grid reliability. Pursuant to legislation enacted in 2022, CEC is required to conduct an assessment and comparison of clean energy alternatives to support grid reliability and make recommendations to expand their deployment. CEC is seeking to collect information on the potential resources and attributes for consideration in these analyses.

The CEC is also soliciting information and public comments related to the potential design of the DEBA program to help expedite the phased development and launch of the program.

In considering potential investments overall, Generac recommends that CEC should keep in mind categories, solutions, and attributes that meet the following criteria:

[1] https://www.energy.ca.gov/publications/2022/demand-side-grid-support-dsgs-program-first-edition

1) Improves energy resilience and independence through onsite behind the meter generation and storage solutions that provide resiliency for homes, businesses, and communities;
2) Optimizes energy efficiency and consumption by enabling sustainable and more efficient power generation and consumption through monitoring, management, and lower-carbon solutions;
3) Protects and builds critical infrastructure by offering innovative solutions that aggregate and optimize next-generation power, communications, transportation, and other critical infrastructure;
4) Does not predetermine successful program design, allows for third party aggregators to design and manage programs in ways that they have proven to be successful, while providing consistency and certainty to program managers and customers that the programs will be in place for a specified period of time and will be available statewide.

These goals are consistent with the legislature's direction as well as existing laws regarding clean energy investments in the electricity sector.

I. Questions for the Public: List of Resource Types and Evaluation Attributes

The RFI seeks feedback on the following questions regarding the list of preliminary resources and qualitative and quantitative attributes by which they will be evaluated:

***General Comments*:**
CEC is taking a technology-specific approach, which may ultimately limit the state's ability to be nimble in addressing future energy needs. In addition to listing specific technologies, CEC should take a similar approach to that taken in the PLS and energy efficiency (EE) categories to the Demand Response/Demand Flexibility (DR/DF) to allow CEC to adapt to the changing technological market and provide greater flexibility as new technology comes online.
Generac recommends that CEC consider all customer-sited solutions that may, collectively, address load shift by focusing on the benefits provided rather than the specific resource. For example, a distributed energy system may include generation, storage, efficiency, along with software that enables control of the system. The diversity of resources provides greater benefits to the grid and to customers, allowing for load reductions and/or power export at times that are most valuable and beneficial.

Generac also recommends that the CEC consider different characteristics or "attributes" and weigh these characteristics separately based on their legislative intent for the three main programs: Clean Energy Reliability Investment Program (CERIP) vs. the Load Shift goals vs. the Distributed Electricity Backup Assets (DEBA).

Recommended Additions:

1) *Are the categories (indicated in Tables 1, 2, and 3) appropriately representing how the CEC should be evaluating resources?*

With the above general comments in mind, the CEC should add to the "Categories" at Tables 1-3 "Aggregation Resources". This would include not only resources that are capable of being

aggregated, but the technology necessary for such aggregation and remote responsiveness. There is a tremendous opportunity for both existing and future resources to respond to grid capacity issues in this manner. The "Aggregation Resources" category will unlock resources that otherwise would not be available to the grid.

Aggregation is a solution that can apply across many resource types and can apply to a mixed-resource on-site system. A particular resource, if separated from its delivery mechanism, may have limited value with regard to these programs. There are significant barriers and costs entailed in signing up DER customers to participate in virtual power plants or other types of aggregation programs, along with taking on the risk of meeting performance standards. Creating a separate category for "Aggregation Resources" would recognize real grid benefits and create a path to streamline and lessen the barriers to entry by providing funds through the CEC programs for aggregation services. The delivery mechanism is as or perhaps even more important than the technology type for achieving the legislature's resiliency and reliability objectives because it converts a single DER that may have a limited impact into one component of a powerful aggregated resource.

2) *Are there resources that should be added to or removed from the preliminary list under each of the categories (shown in Tables 1, 2, and 3)?*

As indicated above, CEC should also consider an inclusive approach that includes a catch-all focused on qualities that would allow for additional flexibility and the addition of new distributed resources as the technology continues to evolve.

3) *Are there other attributes that should be considered, in addition to the ones listed in Table 4? If so, should those be considered for the qualitative and/or quantitative evaluation?*

Table 4 lists the following attributes of resources, which Generac supports:

- Readiness,
- Permitting Ease,
- Interconnection Ease
- Supply Chain Efficiency
- Customer Acceptance
- Cleanliness: Generac recommends re-categorizing this as Emissions– as this is more common terminology and more specific. Both the GHG and the criteria emissions profiles of the resources should be an important factor in the CEC's decision making.
- Policy Alignment
- Equity
- Aggregation Capability

As indicated above, Generac recommends that the CEC consider different characteristics or "attributes" and weigh these characteristics separately for the three main programs: Clean Energy Reliability Investment Program (CERIP) vs. the Load Shift goals vs. the Distributed Electricity Backup Assets (DEBA).

The legislature intended that the CERIP prioritize low emitting resources, while focusing on emergency and distributed resource characteristics for DEBA. Therefore, including all attributes in a single list for this RFI response is not ideal and Generac recommends that the CEC develop separate lists going forward.

In addition to our suggestions on the proposed attributes above, there are two attribute categories that are appropriate to add:

- **Resilience**: Some resources provide grid services but have no impact on local resilience, while other resources can additionally provide some amount of customer or community resilience. Given the increasing need for local resilience in the face of extreme weather, public safety power shutoffs (PSPS) and aging grid infrastructure, Generac recommends that the CEC factor the resilience impact of resources in its assessment. For instance, a transmission-connected battery may provide little to no resilience (particularly when siting does not factor this into its selection process) while customer-sited storage can help people and communities ride through long duration outages more safely, protecting public health during heatwaves, wildfires and other extreme weather events. Absent a consideration of resilience, the CEC might prioritize the transmission-sited resource merely based on levelized cost without considering community needs.

- **Utilization of existing infrastructure:** Given the supply chain constraints we are observing across a wide variety of resources, Generac recommends that the CEC consider the degree to which a proposed resource leverages existing infrastructure. Priority should be given to resources that utilize either equipment already in place or that can utilize currently planned infrastructure build out holding all else constant. This will help to ensure that capacity is fully utilized before investing in more costly, and potentially difficult to deploy, infrastructure. It will also minimize the potential lifecycle impacts of a given solution not considered in the analysis of energy-based emissions. For example, aggregation can unlock value of existing DER resources that otherwise would not be available to support grid reliability during a grid event.

- **Peak Load or Net-Peak Load Reduction Ability:** A critical qualitative attribute for resources that the CEC is considering under these programs is the ability for that resource to contribute to peak-load, and net-peak load reduction. If a resource helps a customer save energy, but not during periods of the day when the grid is more predictably likely to be stressed, this resource is inherently less valuable and less relevant to the statutory goals of the programs the CEC has been enabled to develop and fund. We echo the comments of the California Solar and Storage Association (CalSSA) on this topic submitted in response to this RFI and also suggest that in addition to the capabilities of battery storage to shave peak and net-peak load, aggregation of a diverse set of DERs can have an even greater ability to do so, as is discussed further below.

- **Dispatchability**: If a resource has many other beneficial attributes but cannot be called upon quickly and doesn't respond in a visible or reliable way, it is less valuable to the grid operator during periods of stress. Therefore, one important attribute for CEC to include is **dispatchability.** Generac echoes the comments submitted by CalSSA on dispatchabilty, while noting that many types of DERs, including mixed-resource systems can be dispatchable when controlled by an aggregator.

4) *How should the attributes be weighted relative to each other? Should some attributes be weighted more than others?*

Generac recommends that priority should be given to attributes that relate to customer adoption and benefits. For that reason, Generac recommends prioritizing customer acceptance, permitting, interconnection, equity, resilience, existing infrastructure, and cost structure. Based on legislative direction, the resource's emissions should also be a key factor.

5) *What data/information sources can help inform characterization and evaluation (both qualitative and quantitative) of the different resources?*

Generac recommends soliciting voluntary information from experienced providers on the business model, market readiness, and how the proposed solution would interact with existing offers with respect to each resource. This will be critical to the assessment of options. The CEC should ask that potential program designs identify how costs and benefits would flow to participants, inclusive of the attributes described above.

II. Request for Information on Resource Types –Resource Characterization

As indicated above, Generac recommends that CEC prioritize resources that are capable of aggregation, including mixed-resource types and aggregation technology. Aggregated resources have the potential to leverage existing infrastructure to respond near-term to fill the gap that will occur once Diablo Canyon is off-line, and should be considered as a priority.

Generac Submits for the CEC's Consideration the Following Resource Types:

- Aggregated Smart Thermostats
- Energy Storage–Short Duration– Batteries; and
- Mixed Asset DER Aggregation Solutions.

Aggregated Smart Thermostats

Smart Thermostats should be considered in the demand-distributed scale resource category as an emission-free demand response and demand flexibility resource that should be prioritized in CA according to the state's loading order.

Smart Thermostats have vast potential to support reliability because, when aggregated, millions of households can reduce their energy use to relieve stress on the grid through automated energy management. If fully leveraged, such solutions can enhance grid reliability in the event of an extreme weather event using automated tools that don't require energy expertise or even active engagement by program participants.

One example is ecobee's thermostat optimization platform—**eco+,** which is a free software upgrade for consumers that has been pushed out to ecobee smart thermostats to improve the energy performance of residential HVAC systems. The platform consists of personalized algorithms for intelligent demand response and time-of-use optimization that use data about real-time occupancy

patterns, a home's specific thermodynamic properties and HVAC system performance and indoor humidity conditions to maximize thermostat setbacks while maintaining customer comfort.

Automation solutions such as smart thermostats can adjust usage without requiring a proactive customer response, to deliver visible and predictable reliability value and provide detailed granular telemetry data that offers transparency with respect to what is actually happening with customer load. Leveraging automated devices also produces much greater load impacts overall than relying on a behavioral (e.g., active) response.

The immense value and positive grid impact of adjusting vast quantities of thermostats upwards was demonstrated during the September 2022 heatwave. Unfortunately, during that major grid event, most smart thermostats in California were not enrolled in an existing automated demand response program. Aggregating millions of customers through customized pre-cooling strategies and set point adjustments has the potential to shave thousands of MW of California's overall load during periods of grid stress, and during grid emergency events.

Input on DEBA Smart Thermostat program design

A statewide bilateral contract between the CEC and demand response (DR) program providers would be the best way to leverage the DR availability from smart thermostat customers who are not already enrolled in an existing CPUC or CAISO program. The program should aim to maximize the participation during grid emergencies from consumers with these devices already in their homes, and therefore should not impose unnecessary enrollment burdens. The CEC should avoid imposing any additional enrollment processes that would hinder broad enrollment by device manufacturers and should allow device manufacturers to handle customer engagement and enrollment to maximize participation and potential positive impacts. The program should target residential customers who are not already enrolled in an existing DR program but who have automation technology, with a specific focus on technology that controls large, flexible loads such as cooling.

By establishing and funding a program that provides concrete data regarding the timing and extent of expected (and realized) customer load reductions, the CEC would increase grid operators' certainty regarding the contributions of DR resources. Such a program would set up a mechanism for the state to call on technology vendors to automatically respond to grid emergencies through existing software on consumer devices, increasing customer response and making that customer response "visible" to grid operators as a basis for reducing more expensive emergency procurements of higher emitting fossil resources.

Because this approach could leverage existing devices owned by customers, barriers are lessened to unlock a significant amount of additional emergency reliability resources. ecobee can estimate that this type of program would deliver **50 MW** from its devices alone. To the extent other automation technology vendors can offer similar solutions based on the development of funding for such a program, the impacts could be far greater: market data shows that as of 2022, approximately 14% of residential households in the United States had a smart thermostat, which could translate to over 1**.5 million smart thermostats in California**. With an average load reduction of 0.75-1 kW, such automated devices might provide over **1000 MW** of reliability

resource during an emergency. Dedicating funding to a program that fully harnesses consumer devices to deliver automated response to grid emergencies will thus deliver predictable load reductions that can be reasonably forecasted, allowing for greater state reliance on those resources to the benefit of customers.

Current barriers to full utilization of smart thermostats in existing CPUC programs

Unnecessary obstacles to customer participation in existing programs significantly limit the potential of smart thermostats as a reliability resource. For example, a report by the California Public Utility Commission's Energy Division described an analysis by demand response provider EnergyHub finding that: requiring customers to provide utility account numbers to enroll in DR programs resulted in an 84% drop-off in customer enrollments. This obstacle among others led EnergyHub to enroll just 3% of eligible California customers it targeted for the Demand Response Auction Mechanism (DRAM). This barrier also exists in certain utility Bring Your Own Thermostat programs (BYOT) in California. For example, Southern California Edison ("SCE") offers a BYOT program, but the requirement for a customer to provide their utility account number to enroll has limited participation significantly.

Additionally, this barrier exists in any program that uses a customer enrollment mechanism using the Rule 24 Auth framework, including the Emergency Load Reduction Program Group B and DR providers participating in market-integrated supply-side Demand Response programs. Residential customers do not know their utility account number by memory so requiring this information to enroll in a program creates a point of friction that leads to significant drop off during the enrollment process for customers that would otherwise be willing to participate if enrollment was streamlined and easy. Data shows there is a direct correlation between the level of friction involved in the customer enrollment process and the overall program enrollment rate with high friction enrollment processes leading to low enrollment rates. Through this program, the CEC should seek to eliminate the points of friction in the customer enrollment process that is preventing mass participation in order to maximize the reliability value of existing flexible load resources.

Aggregators such as Generac and ecobee can enroll customers in "emergency only" programs using low friction enrollment frameworks to capture mass participation beyond what is already captured through general demand-response programs that call events more frequently. There could be over 1000 MW of flexible load resources through smart thermostats in customer homes today that are not enrolled in an existing demand response program and are not being utilized during grid emergencies. Smart thermostat penetration is expected to grow to over 27% in the coming years which would nearly double the installed capacity.

Smart thermostats are very impactful residential flexible demand measure during grid emergencies. California's demand on the hottest days of the year is about 50% higher than on a typical summer day, with much if not all of that difference likely due to cooling load.[2] Therefore, the load shed provided by weather sensitive resources such as smart thermostats is even greater during extreme heat events because there is a larger cooling load. Additionally, residential customer willingness to contribute during grid emergencies is greater as evidenced by a program

[2] *See* CAISO, 2019 Annual Report on Market Issues & Performance at 33-34 (June 2020) (comparing average Q3 load with summer peak).

ecobee piloted with SDG&E this past summer to make available all devices in their territory that are not enrolled in their AC Savers Demand Response program for the purpose of Grid Emergencies such as that experienced in September this year. On Friday September 9th, CAISO called a Flex Alert from 4-8 PM, and ecobee customers were notified that an event had been scheduled and were able to opt-out at that time, or during the event. ecobee then sent a DR event to participating pilot customers. Approximately 60% of customers who were asked to participate did so and only 5% of customers opted out during the event. This result is significant as it means there are megawatts of untapped resources in California homes today that can be tapped during grid emergencies through customer friendly, voluntary, opt-out emergency demand response strategies if the program design and funding allow for it.[3]

Aggregated Short Duration Energy Storage

Generac adopts and supports the comments submitted by CALSSA as they relate to the benefits and potential of short duration energy storage and we urge the Commission to use the newly authorized funding to supercharge deployment of home batteries, especially in underserved communities. Residential and commercial behind the meter storage can provide economic, health and safety resiliency benefits to customers who install batteries, and these resources can be shared with their communities and the grid at large through aggregation in VPPs. With increased incentive funding, and reduced interconnection and permitting barriers, California can enable a significant increase in battery capacity before the 2023 fire season. Behind the meter batteries can be installed much more quickly than large scale centralized batteries.

Mixed Asset DER Aggregation Solutions

In addition to the individual technologies outlined above, Generac also encourages the CEC to view Mixed Asset DER Aggregation solutions as a technology category unto itself. Aggregation solutions represent the means by which the collective capacity and energy flexibility represented by the entire spectrum of grid tied BTM DER assets can be brought to bear in addressing the State of California's increasingly critical grid balancing and reliability needs. Aggregation unlocks the value that would otherwise stay behind the customer's meter, invisible to the grid, and aggregation allows for optimization of the DERs, ensuring that the customer's electricity needs can be met while also providing support to the grid.

DER Aggregation software solutions – such as Generac's Virtual Power Plant (VPP) DERMS platform, Concerto™ – are designed to provide the telemetry, monitoring, controls, dispatch, and optimization functions required to leverage the dynamic flexibility characteristics inherent to DERs. The technology has advanced to the point whereby real-time control of a fleet (or fleets) of mixed asset DER against multiple grid imperatives – e.g., dynamic load shifting, shaping, and shedding – can be executed and orchestrated in a highly reliable and measurable manner. This includes the ability to seamlessly integrate with (and add value to) those extant conventional grid balancing and management solutions utilized by the state's electric utilities and independent system operator (e.g., EMS, ADMS, MDMS, etc.).

[3] See https://www.sdgenews.com/article/ecobee-launches-pilot-program-california-utility-help-prevent-power-emergencies

Critically, DER Aggregation can also help to co-optimize between and among different resources within a given site as well as between and among individual sites within a given fleet of assets. These platforms also serve to better balance customer comfort against the need to relieve grid constraints when compared to traditional demand response offerings. This leads to more efficient, effective, and reliable flexibility being delivered to the bulk power system. It can also lead to ancillary benefits such as localized capacity deferral or customer rate savings – benefits that are far more difficult to achieve through more traditional demand response products.

Given the enormity of value that DER Aggregation solutions unlock for customers and grid operators alike – e.g., cost effective grid resiliency, grid balancing, resource adequacy, and energy and capacity savings, to name but a few – Generac encourages the CEC to develop a pathway to incentivize Mixed Asset DER Aggregation solutions commensurate with the critical role that this technology will play in enabling the full value of BTM grid tied DER to be realized.

III. Input on Distributed Electricity Backup Assets (DEBA) Program Design

General Comments:

In addition to resource categories, types, and attributes, the CEC RFI requests input on initial program design for the DEBA program. Pursuant to legislative direction, this program can provide incentives for two main categories of projects:

- Efficiency upgrades, maintenance, and capacity additions to existing power generators, and
- Deployment of new zero- or low-emission technologies, including, but not limited to, fuel cells or energy storage at existing and new facilities.

The statute also requires that all funding recipients participate as on-call emergency resources for the state during extreme events.

- Our understanding is that DEBA customers will be required to enroll in the Demand Side Grid Support Services program, but we request that the CEC clarify this requirement before moving forward in this proceeding.

Generac sees a role for aggregated batteries, thermostats and low emission natural gas generators to meet the objectives of DEBA to provide reliable back-up grid assets. As CALSSA explains in its comments, existing behind the meter battery storage units can be aggregated to replace inefficient fossil generation units (cite) or to provide emergency power if a centralized generation unit fails to perform.

Similarly, existing smart grid enabled natural gas home generators in California can be aggregated and called upon in emergency situations. The cost of aggregating and managing these generation resources should be recognized as "efficiency upgrades" and "capacity additions" due to the fact the aggregation is unlocking a resource that is presently not able to be used to support grid reliability (except in response to urgent calls to action for voluntary participation). With aggregation incentives and new, well-defined programs, the CEC and CAISO will be able to count

on distributed generators, batteries and thermostats to show up when needed as back-up system assets.

As an experienced market participant, Generac is pleased to provide its feedback on the following questions to help inform the design of the Distributed Electricity Backup Assets program and its phased development and launch:

1. *What size of resource and what types of customers should the program target?*

Generac recommends that the CEC should not establish a minimum size requirement for this program, and that it should be inclusive of all customer segments. Special consideration and prioritization should be given to historically underserved communities.

2. *What types of incentive structures and amounts are needed to accelerate the development and deployment of this resource?*

There are three high level characteristics that are critical to incentive designs for this program: consistency, flexibility, and certainty.

A successful incentive structure provides **consistency** across a broad territory, allowing solution providers to develop models with sufficient scale to sustainably serve a broad base of customers. This means having a structure that is universally deployed across the state and isn't fraught with conflicts with existing program offerings. Therefore, Generac recommends that CEC should consider a statewide implementation path that allows for third parties to deliver a statewide program. This would eliminate the need for separate contracts by utility, something currently required by the Demand Side Grid Support program guidelines adopted earlier this year. Using a third-party, statewide model will increase speed to market, increase participation rates, provide a better customer experience, and reduce the need to address customer eligibility by utility.

To echo the suggestions of CalSSA: "developers and customers need to have sufficient certainty about the complete value proposition to deploy new resources. In designing the DEBA program, the CEC must consider that incentive levels must be higher of performance payments through the reliability program are uncertain, to provide the needed certainty. DEBA could offer lower incentive levels if the corresponding reliability program offers greater certainty."

Particularly for low-income customers with varying credit worthiness, and who may or may not own their home, high upfront costs can be daunting. Therefore, a key design element would include not just an upfront rebate but the ability to turn that into a no-cost investment. For third parties to be able to provide this to customers, a key element is having **certainty** that grid services payments will persist over the life of an asset (or at least to the point that the asset pays back). For this reason, Generac recommends that the program lock in payment structures for a duration equivalent to what would be expected with grid scale resources, e.g., in the range of 10-15 years.

The length of time over which DEBA recipients will be obligated to participate as grid resources must also be considered in setting incentive levels. The incentive level must take into account operational costs for the dispatch of resources to be managed for reliability needs. Moreover, the

funding recipient will be limited in their ability to operate the resource for their individual needs over the duration of program participation, and that limitation on the use of the asset must also be included in valuing the incentive.

In our experience, successful structures allow customers and solution providers **flexibility** in how the incentive is factored into the purchase and operation of their resources. The key to this is creating a program and incentive that is consistent statewide, easy to understand, doesn't rely on tax incentives, and can be transferred to a third party where relevant. The CEC should also consider the **length of time** that a customer is obligated to participate as grid resources in setting incentive levels.

Finally, as also recommended by CalSSA, the operational costs for the dispatch of resources must be considered in setting incentive amounts, as this will determine uptake of the program. There are real opportunity costs for commercial businesses in particular that factor into their willingness to participate.

Creating a flexible program will allow for creative use of new financial instruments, such as third-party ownership models, loans, grid services agreements, and/or retail aggregation. Additionally, the CEC should also consider avoiding performance penalties in the early years of the program to allow more flexibility for solution providers and customers to contribute without strict performance requirements that could deter participation. Rather, performance should be incentivized so that home and business owners have a strong motivation to respond when called.

3. *What types of conditionalities and measurement and verification requirements should the program include to ensure funded resources participate and deliver during emergency events?*

A large barrier for residential and small/medium businesses is requirements to use utility data for measurement and verification. Data access and continuing provision of that data can be unreliable and poses a burden to service providers and customers that limits the addressable market. For this reason, a few critical features for the program that would not rely on utility-provided data are useful:

- Generac encourages the CEC to allow M&V to take place at the device level as well as at the meter.

- As indicated above, data access for AMI should be provided in a statewide, streamlined, low friction process. The need for low friction models is demonstrated by a report by the California Public Utility Commission's Energy Division which described an analysis by demand response provider EnergyHub finding that: requiring customers to provide utility account numbers to enroll in DR programs − not required in programs in Texas − resulted in an 84% drop-off in customer enrollments. In addition, requiring customers to complete CISR forms resulted in a 39% decrease in customer enrollment applications, according to EnergyHub. These obstacles led EnergyHub to

enroll just 3% of eligible California customers it targeted for DRAM, as compared with over 40% in Texas.[4]

- Create a statewide clearinghouse for smart-meter data: a good example for California to follow is Smart Meter Texas (SMT). SMT is an example of successful implementation of a streamlined mechanism that has greatly increased customer participation rates in demand response compared to more laborious enrollment processes in other jurisdictions. The SMT data repository was established over a decade ago through a collaborative effort among a range of stakeholders including Texas utilities, the Public Utilities Commission of Texas (PUCT), retail energy providers, in-home device manufacturers, and consumer advocates, as a statewide clearinghouse for smart meter data and associated customer information.[5] In Texas, stakeholders recognized that burdensome requirements for customer authorization and enrollment with a service provider had resulted in low utilization of SMT. The approach SMT created has proved effective in facilitating demand response participation, without requiring individual customers to hunt down their ESI ID or navigate other needlessly burdensome enrollment requirements. SMT enables third party service providers to look up the applicable ESI ID for customers simply using their address.

- Reduce friction in the enrollment process–this is critical to bringing assets online. Generac encourages the CEC to consider this when determining the requirements for data access and M&V.

- Develop Guidance on Establishing Baselines: Another key aspect of M&V that the CEC should consider issuing guidance on is baseline setting. There has been a lot of discussion on improving baseline setting for event-based optimizations like demand response to ensure resources are properly valued, especially during extreme weather events, but baseline setting for daily optimizations like rate optimizations has yet to be closely considered. In the instance of daily rate optimizations, the baseline becomes eroded and cannot be measured accurately after year 1 even though impacts may persist beyond year 1. Therefore, measurement and verification practices for daily optimizations should consider the issuance of baseline non-event days rather than using the previous year as the baseline (the current practice being used in the CPUC's Market Access Program). This is an issue that the CEC should address because the recently adopted revisions to the state's Load Management Standards and the development of the Market Informed Demand Automation Server are meant to encourage mass market daily rate optimization to increase demand flexibility.

4. *In general, please provide any specific proposal or recommendation on the design and implementation of the DEBA program*

Generac encourages the CEC to work closely with current providers of backup technologies to understand the existing and potential future capabilities of these assets and how they can be coupled with related resources such as flexible demand. Many providers of backup resources, such as Generac, also provide rate management and/or aggregation services and therefore can bring a wide range of assets to bear through this channel.

[4] https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/d/6442460092-dram-evaluation-final-report-public-01-4-19-final.pdf at 33.
[5] Understanding Smart Meter Texas - Version 2.0 (Nov. 3, 2014), available at http://www.ercot.com/content/wcm/key_documents_lists/27280/FINAL_Understanding_Smart_Meter_Texas.pdf).

For example, Generac sells "smart" generators into the California market that can be remotely controlled by Generac and aggregated as a "virtual power plant." These generators can therefore provide a much greater level of grid support than the traditional backup generator.

Therefore, Generac recommends that DEBA be designed to incentivize cleaner-than diesel backup generators that can be remotely cycled on-and-off, performing as a virtual power plant. Demand for backup generators is growing in California as customers perceive that electricity is becoming less and less reliable, and the CEC should therefore use DEBA to ensure that Californians are buying cleaner generators that are "visible" and controllable.

Additionally, Generac encourages the CEC to engage on conversations around fuel transition and long run roadmap. The clean fuels space is rapidly evolving and many OEMs are beginning to look at how integrate cleaner fuels into their existing product lines. Pursuant to legislative direction, CEC should consider all clean resources that have the potential to be developed quickly to meet short-and medium-term demand. It is important that the CEC define and encourage alternatives to diesel-backup generators for residential and commercial customers, as these are the primary "emergency" resources being relied on today. Table 3 should include all potential generation types, similar to Table 1. While there will be a priority given to clean resources, smart grid enabled natural gas home standby generators can serve as an important energy backup resource. We are increasingly seeing renewable natural gas, synthetic methane, and/or hydrogen gas being explored for use in customer-sited engines. Given that these technologies are considered for transmission-connected generation, we believe that they should also be considered for customer-sited/ distributed resources, particularly in cases where existing assets can be utilized for this purpose (or can be made to do so with retrofit technology).

Conclusion

Generac thanks the CEC for its work in implementing the immense opportunity recently created by the legislature to invest in DERs. We appreciate the opportunity to provide feedback on the questions and concepts presented in the RFI.

For purposes of illustration of the potential for DER resources to improve reliability and resiliency in California, we have attached five case studies at Appx. A for the CEC's consideration. These examples illuminate the mixed asset and aggregation benefits that should be considered as the CEC develops these programs.

We look forward to continued work with Commissioners and Staff. If we can answer any additional questions about our comments or the products and services that we provide, Generac would be happy to do so.

Thank you,

Anne E. Hoskins
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Appendix A to Generac Power Systems, Inc Response to Nov. 7, 2022 RFI

Short Heading:
Energy Market Opportunities with Battery Storage

Location:
Australia

Implementing and Emphasizing the Benefits of Virtual Power Plants in Southern and Eastern Australia

CHALLENGE: AGL Energy (AGL) needed to implement a software-based grid reliability solution, in part due to voltage fluctuations driven by unprecedently high volumes of solar energy connecting to the distribution grid

SOLUTION: The energy company leveraged Generac Grid Service's Concerto™ platform to provide real-time grid services including thermal and voltage management, and frequency control ancillary services (FCAS), all while taking advantage of energy market incentives

RESULT: The VPP stabilized the grid providing technical, economic and environmental benefits and is poised to address future capacity changes and distribution system needs in Australia's changing energy landscape

OPPORTUNITY

Like other global power grids, Australia's transmission and distribution networks were originally designed to accommodate one-way power flows. However, in the present day, Australian distribution networks are experiencing a growing number of distributed solar generation interconnections. One 2020 study found that up to 95% of network voltages are out of the allowable range at times across all Australian jurisdictions, in part due to power quality response modes that are mandated in all grid-connected inverter systems in the country.

New solutions are required to reduce voltages, thus accommodating bidirectional electricity flows and allowing higher penetrations of renewable energy to connect to the distribution system. Fortunately, Australia has been a longstanding pacesetter in implementing clean energy solutions that extract value from distributed energy resources (DERs). The country also has a decades-long history of implementing creative solutions to add value to its energy markets.

One of Australia's largest energy companies, AGL Energy (AGL) pursued the opportunity created by Australian markets, valuing the network services that DERs can bring to the National Energy Market (NEM). AGL sought to leverage a distributed energy resource system (DERMS) to actualize both voltage- and frequency-balancing services from distributed assets. The implementation of a DERMS would also provide immediate economic and sustainability benefits to the company and its customers, while demonstrating the future potential of VPPs as a clean energy solution.

SOLUTION

When paired with right-sized market incentives, real-time DER asset orchestration can provide grid services to distribution networks, including thermal and voltage management, and frequency control

ancillary services. AGL implemented Generac Grid Services' Concerto DERMS to leverage DERs for such solutions through the creation of a virtual power plant (VPP).

Almost 25% of homes in AGL's service territory feature rooftop PV, thus AGL's VPP program leverages these existing systems while simultaneously rewarding its customers for providing services to the distribution grid and wholesale markets. By using Generac Grid Services' Concerto DERMS, the company began to aggregate and optimize fleets of these residential systems in real time, helping to unlock high-economic-value energy and ancillary services while helping to keep community grids stable.

A cloud-based DERMS solution, the Concerto platform readily scales to optimize the ever-expanding DER fleet within AGL's service territory. In 2019, AGL launched a Bring Your Own Battery program for its customers, further diversifying the mix of residential battery storage within the network. The company has demonstrated that a fleet of behind-the-meter batteries can, in aggregate, manage peak demand while limiting real and reactive power. AGL has also launched a series of experiments that continue to explore the potential to increase network service value on systems sited at strategic locations along the distribution grid.

OUTCOME

AGL's growing VPP serves as an example of the grid stability and economic benefits of progressive market rules. The VPP program also illustrates the economic returns accessible through the implementation of a complete DERMS solution. For example, leveraging real-time data on fleet status and availability allows AGL to confidently forecast and bid FCAS availability to maximize the systems' value while ensuring that customer-sited batteries continue to serve their primary purpose of solar self-consumption to better power homes. This accuracy helps participants to confidently enroll in AGL's programs and supports improved customer satisfaction.

While Australian energy markets continue to evolve, creating the potential to enhance grid stability and unlock more value from these programs in the future, the capabilities provided by AGL's VPP have already shown the benefits of clean energy for the company and its customers. The agility and scalability provided by Generac Grid Services' Concerto platform continue to support the energy company as distribution network needs and Australian energy markets evolve in tandem.

Short Heading:
Achieving Flexibility with a Virtual Power Plant

Location:
Oregon

Quote:
"We've been really impressed with the results of our VPP program to date. We've seen faster integration and enablement of resources, positive customer feedback, increased realization rates, and overall greater value out of the resource." - manager of distributed resource planning, PGE.

Leveraging Distributed Energy Resources for a More Flexible Future

CHALLENGE: Portland General Electric needed to create distributed flexibility at scale, focusing on decarbonizing the grid to meet energy and climate goals.

SOLUTION: Generac Grid Services' Concerto™ software platform was implemented as a solution to help PGE meet its climate-related goals, increase grid resiliency, and improve customer satisfaction.

RESULT: The utility remains on-track to meet its ambitious greenhouse gas emissions reduction goals while also creating a dependable flexible resource of distributed assets.

OPPORTUNITY

Facing aggressive greenhouse gas reduction goals, Portland General Electric (PGE) needed to make major changes to the way it produces, delivers, and uses electricity. To reduce greenhouse gas emissions by over 80% by 2050, and to meet other energy and climate goals, the utility concluded that potentially 25% of load needs to be flexible – capable of being modulated on demand. By implementing a distributed energy resource management system (DERMS), PGE could begin to integrate more flexible DERs into its grid at scale.

Embracing distributed flexibility is a critical component of PGE's future energy portfolio, as outlined in the company's integrated resource plan. This decentralized and decarbonized grid must optimize the way the power is produced, stored, and used across millions of distributed energy resources (DERs), many of which are located behind the meter. A flexible grid also creates other benefits, such as improving reserve power margins and reducing the need for additional, costly centralized power plants.

SOLUTION

PGE needed to create a larger virtual power plant (VPP) capable of controlling and optimizing a variety of DER fleets. The VPP platform would need to simplify the management of multiple devices, by multiple vendors and would also need to incorporate multiple programs, each with its own unique set of parameters.

By leveraging Generac Grid Services' Concerto platform, PGE built its large-scale VPP, enabling control of a variety of customer-sited DERs, including residential solar arrays, battery storage systems, smart thermostats, water heaters and other flexible loads. The utility is also integrating both residential and commercial EV charging ports to address the need for real-time managed charging of electric vehicles.

PGE also retains a focus on generating additional value for its customers via the VPP. The utility takes a portfolio view of DERs under its control and helps customers to adopt additional clean, distributed technologies capable of providing grid services through the VPP. By integrating customer-sited DERs into its grid, PGE can enhance current grid reliability through real-time power management operations and plan for longer-term clean energy programs and solutions. Simultaneously, customers perceive a direct benefit through their ability to earn incentives, support community-level grid stability, and contribute to the broader western energy markets.

OUTCOME

PGE continues to work towards meeting its long-term goals and remains on-track to add up to 200 MW of distributed flexibility by 2025, equivalent to approximately 5% of summer and winter peak load.

In May 2019, PGE's program received the Peak Load Management Alliance's (PLMA) Program Pacesetter Award. The accolade honors industry leaders that create innovative ideas, methods, programs, and technologies that manage end-use loads to meet peak-load requirements while supporting successful integration of DERs on the grid.

Alongside its VPP program, PGE has developed additional programs to support its distributed flexibility goals:

- The **Smart Grid Test Bed**, which integrates smart grid technology on a large scale, has been established in neighborhoods in three Oregon cities. The test bed will be the hub that brings together separate pieces of technology and energy delivery to pilot the integrated grid of the future. The test bed uses Generac Grid Services' Concerto platform to aggregate, control, and optimize the flexibility available in each zone to test the maximum amount of flexibility that can be harnessed within a given area.
- **Time of Use (TOU)** and **Peak Time Rebate (PTR)** programs targeting 58,000 customers; the incremental capacity provided by these programs will be combined with the dispatchable flexibility in the VPP to provide PGE's power operations desk with a single consolidated view of the system flexibility available at any given moment.

Driven by the need to decarbonize its grid – while making it more resilient and reliable – PGE has created a scalable VPP-based flexibility resource with the help of Concerto's comprehensive DER monitoring and orchestration capabilities.

"We've been really impressed with the results of our VPP program to date. We've seen faster integration and enablement of resources, positive customer feedback, increased realization rates, and overall greater value out of the resource," said a PGE manager of distributed resource planning. "We look forward to further growth and learning in the coming years."

GENERAC®
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KAHAUIKI VILLAGE
Honolulu, Hawaii

CASE STUDY

CHALLENGE:
Create a comprehensive and resilient energy package to ensure residents have an affordable, environmentally friendly, reliable and safe energy system.

SOLUTION:
Generac 150 kW propane generator.

RESULT:
A cost effective and flexible solution that helps maximize resources to implement a long-term strategy aimed to achieve permanent homes for homeless families with children.

"We were drawn to Generac for the cost effectiveness of their product and flexibility of available solutions."

Microgrid with Propane Generator Ensures Resiliency for Residents

Homelessness is not a new issue. After declining briefly after the Civil War, homelessness first became a national issue in the 1870s. According to the National Alliance to End Homelessness, there are an estimated 553,742 people in the United States experiencing homelessness on a given night. This represents a rate of approximately 17 people experiencing homelessness per every 10,000 people in the general population. In 2019, Washington, D.C. had the highest estimated rate of homelessness in the U.S. with 94 homeless individuals per 10,000 of the population. Hawai'i had the third highest rate among all U.S. states with about 45 homeless individuals per 10,000 of the population.

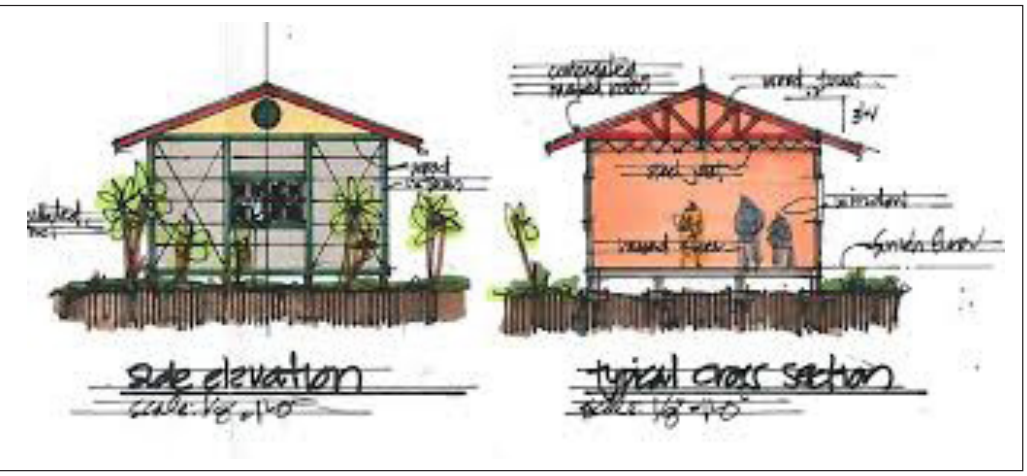
Dealing with Hawai'i's homeless population is a complex issue. One initiative to help the situation has been the creation of a community designed to transition people off the streets and into new productive living spaces. Kahauiki Village is a housing project in Honolulu on the island of Oahu designed as long-term housing for families in need. Kahauiki Village provides long term, permanent, affordable housing for over 600 adults and children on Oahu on about 12 acres of land.

Community leaders both public and private created a unique partnership that brought together each individual partner's resources to make Kahauiki Village a reality. Hawai'i Gas, along with representatives from across the state's major energy sector was one of the project partners that played an integral role in identifying and designing the community's energy sources and needs, to ensure a cost-effective, reliable and resilient energy system for the community. Working together the group was able to create a comprehensive and resilient energy package to ensure residents have an affordable, environmentally friendly, reliable and safe energy system.

According to Brian Yee, Hawaii Gas' project manager for this installation, "Kahauiki Village offers a number of energy sources. Each house has solar thermal for hot water, gas water heater backup, gas for cooking, a PV farm with battery storage and as a backup to the village's energy supply, a propane powered generator. Having multiple energy sources creates resiliency for the community that allows them to have power through any type of event, natural or man-made."

As an example of the unique solution deployed at Kahauiki, the village has its own independent power supply, or microgrid, that is powered by photovoltaic (PV) solar panels and a battery. The village only draws power from the utility when there is not enough sunlight and battery to meets its energy needs. Microgrids provide increased resiliency through several means. First, by locating electricity generation close to the electrical users and the needs they serve, they can more efficiently deliver the required power. Second, they provide a significant improvement in power reliability by their ability to operate independently of the utility's grid. Kahauiki Village's connection to the grid is minimal in capacity to reduce standby and demand costs. Unlike conventional grid-tied PV systems where the grid alone can provide sufficient power under all conditions, the grid is capable of only supplementing Kahauiki Village's energy needs. However, with the threat of hurricanes, mudslides and other power failures, it was important for the community to have backup power. With 144 total

CASE STUDY Microgrid with Propane Generator Ensures Resiliency for Residents



APPLICATION:
Residential Housing

MODELS:
150 kW Propane Generator

homes, a daycare center, security and other critical buildings in the community, having power at all times was essential.

"Both centralized energy storage and emergency backup power were critical to the success of the project," said Tim Johnsson, PhotonWorks. "It helps to reduce the high cost of requiring individual, autonomous energy storage and backup infrastructure in each home, and provides adequate redundancy to achieve a high level of reliability."

PhotonWorks Engineering is a construction and renewable energy company. They teamed up with InSynergy Engineering to design an integrated PV system, which in combination with a propane-fueled gas generators, handles all of the residents' daily and emergency energy needs. When looking for a backup power solution partner, the team turned to Generator & Power Systems, Generac's Industrial Power distributor for the Hawai'ian Islands.

"The original design called for three smaller generators," said Travis Tilton, Generator & Power Systems. "Two generators would cover the load while the third was for N+1 redundancy. However, after reduction in some of the anticipated site loads and evaluation of generator alternatives, we specified one Generac Industrial SG150 propane generator as it would cover all the loads as a more cost-efficient solution." Tilton added that, as the community continues to grow and expand, more generators can be added to the current system. This allowed the village to make a smaller initial investment and scale accordingly based on increased power demands.

"This was our first real experience working with Generac," said Johnsson. "We were drawn to Generac for the cost effectiveness of their product and flexibility of available solutions. Competitive products had a significantly higher cost, and due to the nature of the project where residents' rent would be paying for the generator, cost was a serious concern."

An important element to the village design was making it sustainable. The state of Hawai'i has put in place strong legislation in order to increase the amount of renewable energy sources on the islands. With a goal to generate 100-percent clean energy by 2045, the state is working to align government regulations and policies with clean energy goals, facilitate processes for developing renewable energy, deploy renewable generation and grid infrastructure, and explore next generation technologies and new applications of existing technologies. With this in mind, the design team did not want to use diesel-fueled generators to support the PV-based microgrid. They instead wanted a cleaner fuel choice. "Hawai'i Gas provides the fuel onsite and propane is already being piped in for water heaters and the propane-fueled gas cooking ranges," said Tilton. "The island doesn't have any natural gas and diesel fuel has installation challenges, leaving propane as an ideal solution for this project."

The microgrid produces its own power by capturing and storing electricity from the PV panels or the electrical grid. The generator turns on during a utility outage after the batteries have been drained. The village has already experienced several outages long enough for the energy storage batteries to drain, requiring the generator to start. The generator is actively playing a key role in the village's resiliency and it will continue to provide peace of mind to residents throughout storm season and during any other power outages.

The Kahauiki Village is a groundbreaking initiative that maximizes public and private resources to implement a long-term strategy aimed to achieve permanent homes for homeless families with children, and to provide employment opportunities within walking distance for parents. It is a project that could be duplicated around the nation in other in-need areas. "This is something special," said Johnnson. "Being able to help families with new housing, clean accommodations and breaking the cycle; we are incredibly proud to have played a role in this project."

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