

NEM Paired Storage

Traditionally, when solar and storage have been installed behind a customer meter, the solar system has been considered a NEM-eligible generator and the storage system has been considered a non-NEM device. Customers have not been able to discharge from a battery to the grid for net metering credits.

For systems with a battery larger than 10 kW, to prove that all exports to the grid come from solar, customers have been required either to install a relay device to prevent exports from the battery or to install a separate meter on the solar inverter in an AC-coupled system. In the metering option, the utility compares solar production to grid exports in every billing interval to make sure the customer is not exporting more than they are producing from solar.

The challenge has been that utilities put you in their normal construction queue when you need a meter and might not come out for nine months. Metering can also be expensive, ranging from \$400 for a simple bubble meter to \$15,000 for an interconnection on a primary line. Relays are also prohibitively expensive at a cost on the order of \$60,000.

If the battery is verifiably charged 100% from solar, however, it becomes a NEM-eligible device. In this case, the utility does not need to track where exports come from. Any exports get NEM credits. From a billing perspective it is treated the same as solar without storage.

It is common for systems to be configured to charge the battery entirely from solar, but utilities have not been able to verify that functionality. A new UL standard has now been created to solve this problem. The certification requirements decision (CRD) for power control systems is a new optional component within UL 1741.

The CRD can certify two operating modes for NEM paired storage. Solar-Only Charging mode (also known as Export Only Mode) guarantees that a battery cannot charge from the grid. In No Grid Exports mode (also known as Import Only Mode), the battery can charge from the grid but can only discharge for on-site load.

Installers must use equipment that has achieved certification, although interconnection applications can be submitted while certification is pending. CALSSA will maintain a list of certified equipment at: calssa.org/powercontrolsystems.

In addition to avoiding the cost and delays of meters and relays, this new capability will allow customers to export electricity from the battery in the evening for NEM credits at peak TOU rates. Previously, energy storage systems used for arbitrage could only discharge during non-solar hours to reduce on-site load. This storage management approach works well to reduce customer bills when the customer has evening load and the storage control system is capable of “load-following.” Under the CRD, you do not need to follow the load and can do arbitrage for customers that do not have evening load. When a solar-only charged system discharges

during TOU peak hours, the customer reduces their kWh purchases when they consume the power and gets NEM credits at peak rates when the power goes onto the grid.

Verifying the Installation Settings

The CRD certifies that the equipment will perform correctly when it is set to the right operating mode. As part of the interconnection application process, installers will need to verify that the system has been set to the correct mode. Under the CRD, once a system has been set to one of these modes, it cannot be switched to another mode except by the manufacturer.

SDG&E has an attestation form that must be signed by the customer to attest that the system has been set to the correct operating mode and will not be changed. SCE and PG&E have not yet specified the process for verifying the operating mode, but will soon include language in their interconnection handbooks with these requirements. Installers will likely need to upload photos or screenshots to verify settings.

Below 10 kW

For systems smaller than 10 kW, a separate meter is not required and the utilities instead use an “estimation methodology” to determine solar production. The goal is still to compare exports with solar production, but the solar production is estimated. The estimate is done on a monthly basis because you cannot accurately predict solar output on an hourly basis due to changing weather conditions. Monthly NEM credits are capped at the expected monthly output of the solar system. The utilities have agreed to generous assumptions for the production estimate. Therefore, as long as the customer is not intentionally doing storage arbitrage with grid power, the only way NEM credits will be reduced with this methodology is if a customer has an extremely productive system and negligible load.

The 10 kW threshold is judged by the storage inverter size in an AC-coupled system. In a DC-coupled system, the storage size is the “maximum continuous discharge rate” of the battery if that value is listed on the battery data sheet. If the battery data sheet does not have a value with that label or a label that is substantially equivalent, the utility uses the inverter size.

Large DC-Coupled Systems

Under the previous rules, DC-coupled systems larger than 10 kW could not be interconnected behind the meter. This is because the utilities have not recognized any revenue-grade DC meters, so it has not been possible to meter solar production and compare it to exports if solar shares an inverter with storage. Large DC-coupled systems are now allowed if they are certified to the CRD.

Tariff Language

For SCE, see Special Condition 6 in the Schedule NEM-ST. It will be updated soon to include language that has been approved by the CPUC on “power control-based options.”

For SDG&E, see Special Condition 10 of Schedule NEM-ST. It will be updated soon to include language that has been approved by the CPUC on “firmware-based or software-based equipment.”

PG&E’s tariff language is more confusing and is still pending CPUC approval. Special Condition 9 of Schedule NEM2 defines two types of NEM paired storage. “Integrated Storage” is equivalent to Solar-Only Charging. “Directly-Connected NEM-Paired Storage” can meet the requirements for the No Grid Exports operating mode. Language related to certifying these operating modes to a national standard will be added to Schedule NEM2 after it is approved by the CPUC.

Storage Size Limit

The storage system sizing limit for systems larger than 10 kW is 150% of the size of the solar system. That is, a 100 kW solar system could be paired with a storage system with a discharge capacity up to 150 kW. There is no requirement to size solar in relation to the solar system size for storage systems smaller than 10 kW. This size cap in the NEM tariff is in addition to the separate sizing limit under SGIP that the discharge capacity (inverter size) of an energy storage system cannot be higher than the customer’s peak demand over the previous 12 months.