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AN018 - Sonnen – 3-Ph Net Metering Overview

Overview

This application note sets out to explain that when single phase sonnenBatterie systems, or three phase sonnenBatterie systems with single phase PV systems are installed on domestic three phase properties within Australia the overall energy flow in and out of the grid becomes rationalised from the householders and billing perspective. (the situation in New Zealand is however different due to an alternative billing / metering configuration).

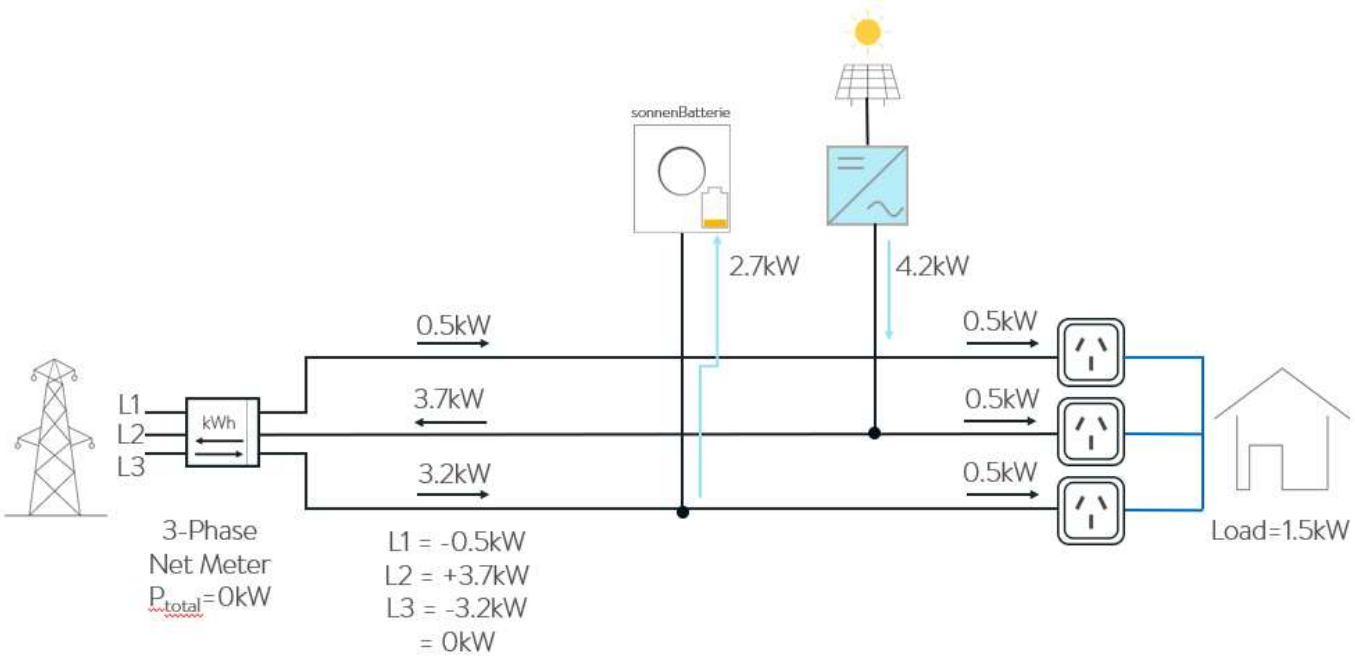
Net power flow explanation

If a PV system has been installed with net metering, the power generated from the PV is first used to supply the loads in the household. Any excess PV power will be fed back into the grid. On the other hand, if there is not enough PV power generated to supply the loads, the shortage of power will be imported from the public electricity grid. With net metering in place, consumers are only billed for their net electricity use (import from the grid) and gain a benefit from the net energy exported to the grid.

The concept is exactly the same for domestic three-phase systems whereby the net metering takes the sum of the power flow from each phase and adds them together into a single value. This sum of all phases (the net amount) is used to measure and meter the value of energy either being imported or exported to the grid. Just like with a single-phase system the customer just pays for the total energy either purchased or sold.

The benefit of having single phase sonnenBatterie system on a three-phase domestic property is that it can help to balance out the net energy power flow and add value to the consumer.

The sonnenBatterie through its metering, independent from the utility metering will also look at the total power being consumed, and the Solar PV energy being generated. The sonnenBatterie will support this net affect by either charging or discharging the batteries regardless of the balance of energy across the phases.



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For example, a three-phase property has single-phase Solar PV installed on one phase (L2). If the PV is generating 4.2kW and the load is only 1.5kW balanced across each phase (0.5kW each, L1, L2, L3), then the three-phase net meter will simply record an export of 2.7kW to the grid, although in reality L2 is actually exporting 3.7kW, both L1 and L3 are importing 0.5kW each.

If a sonnenBatterie system is installed and has the charge rate / SOC available to allow a 2.7kW charge then the customer will have no power flow recorded from the grid. The PV will produce 4.2kW, the loads total 1.5kW (0.5kW p/Phase) and the sonnenBatterie will charge at 2.7kW.

Again, let us assume that the sonnenBatterie is installed on L3, the Solar PV will be producing 4.2kW on L2 but 0.5kW will be used on that phase by the load exporting 3.7kW. The load on L1 is 0.5kW which comes from the grid. The load on L3 is 0.5kW which comes from the Grid plus the 2.7kW to charge the sonnenBatterie (3.2kW). However from the net metering perspective, although L2 is exporting 3.7kW, L1 is importing 0.5kW and L3 is importing 3.2kW the net sum equals 0kW and the consumer is utilising all of the solar PV being produced and having no energy charge from the grid.

If you have any further questions or seek any further clarification please contact via academy@sonnen.com.au.

Yours faithfully,

James Sturch
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