UNBALANCED POWER SUPPLY SOLUTION (Energy Storage Systems)

VER 05, UPDATED ON AUG 18, 2020

Why do we need Unbalanced Phase-level Power Supply?

In a three-phase home connection, both three-phase and single-phase loads are used, which causes unbalanced power consumption among the three phases.

With solar power adopted into a three-phase home connection, it would be much better to share solar power among all three phases before metering, instead of exchanging with the grid, especially in a system without FIT or with an energy meter that cannot balance buy/sell power.

In addition, phase-level export power control regulations in some countries require a power limit on each phase.

Unbalanced output ability, therefore, makes power sharing possible before metering and phase-level export power limit.

GoodWe Unbalanced Power Supply Solution

GoodWe's three-phase energy storage inverter ET series can provide unbalanced output on both grid side and backup side.

Solution Introduction

We take a zero-export power limit scenario as an example. Unbalanced power output capacity is crucial because the export power is limited on each phase separately, which means the inverter is able to output different power according to the load consumption on each phase. The export power on each phase can be controlled down to 0W.

In energy storage systems with GoodWe hybrid inverter ET series, a Smart Meter with CTs is used to monitor real-time running consumption on each phase so that the inverter adjusts its output power on each phase accordingly. In this way, no excess energy would be fed into the grid on any phase.

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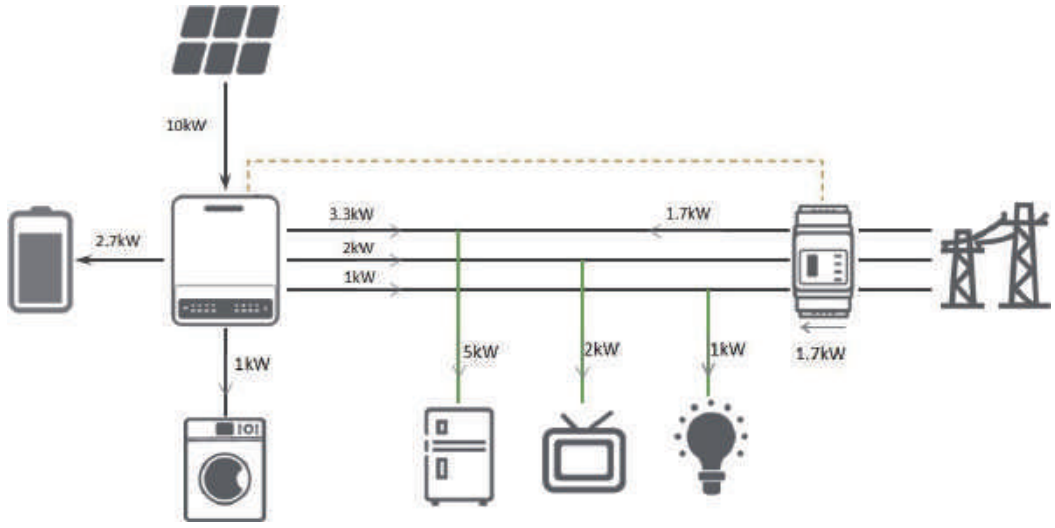

Figure 1. Unbalanced Output Simulation Diagram

NOTE

1. The on-grid output of GoodWe ET series can realize 100% unbalanced phase-level output, which means each phase can output power from 0W up to 1/3 of inverter nominal output power.
2. The back-up output of ET series also has unbalanced output function (100% unbalanced output). This is a default function for all ET inverters.

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