WHAT IS CLAIMED IS:

1. A standby power supply, comprising:

a first sub power supply configured to provide alternating current electrical energy, wherein the first sub power supply is connected to an input terminal of an alternating current/direct current (AC/DC) converter;

the AC/DC converter configured to convert the alternating current electrical energy into direct current electrical energy, wherein an output terminal of the AC/DC converter is connected to an output terminal of the standby power supply; and

second sub power supplies configured to provide the direct current electrical energy, wherein the second sub power supplies are connected to the output terminal of the standby power supply,

wherein the first sub power supply is configured to supply power independently when a power grid voltage is lower than a voltage threshold and expected output power of the standby power supply is less than or equal to a power threshold, and to supply power jointly with the second sub power supplies when the power grid voltage is lower than the voltage threshold and the expected output power of the standby power supply is greater than the power threshold, and the second sub power supplies are configured to supply power jointly with the first sub power supply when the power grid voltage is lower than the voltage threshold and the expected output power of the standby power supply is greater than the power threshold.

2. The standby power supply according to claim 1, wherein the power threshold P_threshold is determined according to the following formula:

P_threshold = P_average * a + P_peak * (1 - a),

wherein $0 < a < 1$; P_average is average power required for a power supply load, which is subjected to statistics based on minute level load data;

P_peak is peak power of the power supply load, which is subjected to statistics based on second level load data; and a is a proportional coefficient, by which the power threshold is adjusted and having the first sub power supply providing the average power and the second sub power supply providing the peak power.

3. The standby power supply according to claim 1, further comprising

a first switch, wherein the first sub power supply is connected to the input terminal of the AC/DC converter via the first switch.

4. The standby power supply according to claim 3, further comprising

DC/DC converters configured to convert the direct current electrical energy into direct current electrical energy with different parameters, wherein input terminals of the DC/DC converters are connected to the second sub power supplies, and output terminals of the DC/DC converters are connected to the output terminal of the standby power supply via second switches.

5. The standby power supply according to claim 1, wherein

the first sub power supply comprises one or more of the following:

a generator; and

a combination of a battery pack and a direct current to alternating current converter; and

each of the second sub power supplies comprises one or more of the following:

a battery pack and a supercapacitor; and

a combination of a generator and an alternating current to direct current converter.

6. The standby power supply according to claim 4, wherein the DC/DC converters are bidirectional DC/DC converters, and the standby power supply further comprises

a third switch, wherein an alternating current power grid is connected to the input terminal of the AC/DC converter via the third switch.

7. The standby power supply according to claim 6, wherein the first switch and/or each of the second switches and/or the third switch comprises one of the following: a power switch, a circuit breaker, a contactor, and a relay.

8. The standby power supply according to claim 1, further comprising

inverters configured to convert the direct current electrical energy into the alternating current electrical energy, wherein input terminals of each of the inverters are connected to the output terminal of the standby power supply, and an output terminal of each of the inverters is connected to a load.

9. The standby power supply according to claim 6, further comprising a controller configured to:

when detecting that a voltage of the alternating current power grid connected via the third switch is lower than a voltage threshold, closing the first switch and/or the second switches to connect the first sub power supply and/or the second sub power supplies, wherein in the case of closing the second switches, the DC/DC converters operate forwards to discharge the second sub power supplies, wherein:

when the expected output power of the standby power supply is less than or equal to a power threshold, closing the first switch and opening the second switches to connect the first sub power supply; and

when the expected output power of the standby power supply is greater than the power threshold, closing the first switch and the second switches to connect the first sub power supply and the second sub power supplies.

10. The standby power supply according to claim 9, wherein the controller is further configured to:

when detecting that the voltage of the alternating current power grid connected via the third switch is higher than the voltage threshold and an electric quantity of the second sub power supplies is lower than an electric quantity threshold, closing the second switches, such that the DC/DC converters operate reversely to charge the second sub power supplies from the alternating current power grid; and/or

when detecting that the voltage of the alternating current power grid connected via the third switch is lower than the voltage threshold and the electric quantity of the second sub power supplies is lower than the electric quantity threshold, closing the first switch and the second switches, such that the DC/DC converters operate reversely to charge the second sub power supplies from the first sub power supply.

11. A method for operating the standby power supply according to one of claims 1 to 10, characterized by comprising:

determining a power grid voltage of an alternating current power grid connected via a third switch;

when the power grid voltage is lower than a voltage threshold and expected output power of the standby power supply is less than or equal to a power threshold, closing a first switch and opening a second switch to connect a first sub power supply for supplying power by the first sub power supply;

when the power grid voltage is lower than the voltage threshold and the expected output power of the standby power supply is greater than the power threshold, closing the first switch and the second switches to connect the first sub power supply and the second sub power supplies for supplying power together by the first sub power supply and the second sub power

supplies, such that DC/DC converters operate forwards to discharge the second sub power supplies; and

when the power grid voltage is higher than the voltage threshold and an electric quantity of the second sub power supplies is lower than an electric quantity threshold, closing the second switches, such that the DC/DC converters operate reversely to charge the second sub power supplies from the alternating current power grid.

12. The method according to claim 11, further comprising the following steps:

determining the power threshold P_threshold according to the following formula:

P_threshold = P_average * a + P_peak * (1 - a), wherein $0 \leq a \leq 1$; P_average is average power required for a power supply load, which is subjected to statistics based on minute level load data; P_peak is peak power of the power supply load, which is subjected to statistics based on second level load data; and a is a proportional coefficient, by which the power threshold is adjusted.

13. A wind generator having the standby power supply according to one of claims 1 to 10, wherein a load connected to an output terminal of the standby power supply comprises one or more of the following: a yaw bearing, a pitch bearing, and a control circuit.

14. A clean energy device having the standby power supply according to one of claims 1 to 10.

15. The clean energy device according to claim 14, wherein the clean energy device is a wind generator.