CLAIMS

1. A station-building power supplier that supplies power to a station load using both AC power supplied from an AC system and surplus regenerative power generated by trains, the station-building power supplier comprising:

a feeding-voltage detector that detects a feeding voltage;

an SOC (State Of Charge) detector that detects an SOC of a capacitor that stores therein the surplus regenerative power;

a first power converter that performs DC/DC power conversion in both directions between a feeder and the capacitor;

a second power converter that converts DC power supplied from the capacitor to AC power and supplies the AC power to the station load; and

a controller that controls the first power converter and the second power converter on the basis of the feeding voltage and the SOC, wherein

the controller

controls the first power converter such that power is supplied from the feeder to the capacitor when the feeding voltage exceeds a predetermined first voltage threshold,

controls the second power converter such that power is supplied from the capacitor to the station load when the SOC exceeds a predetermined first SOC threshold, and

controls the first power converter such that power is supplied from the capacitor to the feeder when the feeding voltage falls below a second voltage threshold that

is smaller than the first voltage threshold and the SOC exceeds a second SOC threshold that is larger than the first SOC threshold.

2. The station-building power supplier according to claim 1, wherein

the controller controls the second power converter such that an amount of power supplied from the capacitor to the station load is constant.

3. A station-building power supplier that supplies power to a station load using both AC power supplied from an AC system and surplus regenerative power from trains, the station-building power supplier comprising:

a feeding-voltage detector that detects a feeding voltage;

a first power converter that performs DC/DC power conversion in both directions between a feeder and a capacitor that stores therein the surplus regenerative power;

a second power converter that converts DC power supplied from the capacitor to AC power and supplies the AC power to the station load;

an SOC detector that detects an SOC of the capacitor; and

a controller that controls the first power converter and the second power converter on the basis the feeding voltage and the SOC, wherein

the controller

controls the first power converter such that power is supplied from the feeder to the capacitor when the feeding voltage exceeds a predetermined first voltage

threshold;

controls the second power converter such that power is supplied from the capacitor to the station load when the SOC exceeds a predetermined first SOC threshold; and

controls the second power converter such that power supplied from the capacitor to the station load is reduced in a lapse of a predetermined time period when the SOC becomes lower than the predetermined first SOC threshold.

4. A station-building power supplier that supplies power to a station load using both AC power supplied from an AC system and surplus regenerative power generated by trains, the station-building power supplier comprising:

a feeding-voltage detector that detects a feeding voltage;

an SOC (State Of Charge) detector that detects an SOC of a capacitor that stores therein the surplus regenerative power;

a first power converter that performs DC/DC power conversion in both directions between a feeder and the capacitor;

a second power converter that converts DC power supplied from the capacitor to AC power and supplies the AC power to the station load; and

a controller that controls the first power converter and the second power converter on the basis of the feeding voltage and the SOC, wherein

the controller

controls the second power converter such that power is supplied from the capacitor to the station load

when the SOC exceeds a predetermined first SOC threshold, and

controls the first power converter such that power is supplied from the capacitor to the feeder when the SOC exceeds a predetermined second SOC threshold that is larger than the predetermined first SOC.

5. A station-building power supplier that supplies power to a station load using both AC power supplied from an AC system and surplus regenerative power generated by trains, the station-building power supplier comprising:

a feeding-voltage detector that detects a feeding voltage;

an SOC (State Of Charge) detector that detects an SOC of a capacitor that stores therein the surplus regenerative power;

a first power converter that performs DC/DC power conversion in both directions between a feeder and the capacitor;

a second power converter that converts DC power supplied from the capacitor to AC power and supplies the AC power to the station load; and

a controller that controls the first power converter and the second power converter on the basis of the feeding voltage and the SOC, wherein

the controller controls the second power converter such that a fixed amount of power is supplied from the capacitor to the station load when the SOC exceeds a predetermined first SOC threshold.