CLAIMS

1. A power supply system comprising:

an AC network connected to an electricity network and an electrical load;

a DC bus;

at least one energy generation system connected to the DC bus;

at least one energy storage system connected to the DC bus; and

a statcom connecting the DC bus to the AC network;

wherein the statcom and the voltage of the DC bus control electricity flow on the DC bus.

2. The power supply system of claim 1, wherein the energy generation system comprises one or more of a renewable electricity source, a hydro generator, biomass generator, fuel cell, and/or hydrocarbon generator.

3. The power supply system of claim 1, wherein the energy generation system is connected to the DC bus via an AC/DC converter or a DC/DC converter to match its voltage output to substantially accord with the voltage of the DC bus.

4. The power supply system of claim 3, wherein the converters comprise a communication system that communicates with the statcom to transfer information about the converters and/or to receive instructions from the statcom.

5. The power supply system of claim 1, wherein the energy storage system comprises one or more batteries.

6. The power supply system of claim 1, wherein the energy storage system is connected to a DC/DC converter which is connected to a DC bus.

7. The power supply system of claim 6, wherein the DC/DC converter is bidirectional.

8. The power supply system of claim 1, wherein the statcom is programmed to prioritise available power flow from the DC bus to itself or to the energy storage system.

9. The power supply system of claim 1, wherein the system further comprises a power sensor.

10. The power supply system of claim 9, wherein the power sensor is located on the AC network.

11. The power supply system of claim 9, wherein the electricity network is connected to the AC network via the power sensor.

12. The power supply system of claim 9, wherein the power sensor communicates a power measurement to the statcom wirelessly or over a wired connection.

13. The power supply system of claim 1, wherein the statcom is configured to provide peak demand shifting, phase balancing of a multiphase AC network, export control to the electricity network, and/or an uninterruptable power supply that meets anti-islanding requirements for an electricity network connected generation system.

14. The power supply system of claim 1, wherein the statcom improves the quality of electricity imported from the electricity network for the electrical load based on measurements the statcom takes at its connection to the AC network or the power measurement from the power sensor.

15. The power supply system of claim 1, wherein the DC bus has a voltage of greater than 100V.

16. The power supply system of claim 15, wherein the DC bus has a voltage that varies within the range of 200V to 600V.

17. The power supply system of claim 1, wherein the AC network has a voltage of less than 400V.

18. A method of improving the quality of an electricity network, the method comprising the steps of:

measuring electrical characteristics of the electricity network;

using a statcom connected to the electricity network to vary its output to improve the quality of the electricity network by implementing voltage control, harmonic suppression, and/or power factor correction.

19. The method of claim 18, wherein the step of measuring further comprises measuring at the statcom or measuring at another point in the electricity network.

20. The method of claim 19, wherein the step of measuring at another point in the electricity network comprises measuring using a power sensor and communicating the power measurement to the statcom.