Claims

1. A method of controlling an inverter energy system supplying power to a site, the inverter energy system including one or more inverters and being connected to a mains power supply and to a site load, the method including

monitoring, at a monitoring point at the site, the forward or reverse power flow into or out of the mains power supply;

setting a rate limit for power flow into or out of the mains power supply; and

varying the supply of power to the load from the inverter energy system by controlling one or more of the inverters so that the power flow to the load is varied thereby controlling the power flow into or out of the mains power supply to be within the rate limit.

2. The method of claim 1, wherein control of the plurality of inverters is achieved by isolation of one or more of the inverters.

3. The method of claim 1, wherein control of the plurality of inverters is achieved by ramping the power output of one or more of the inverters up or down.

4. The method of claim 1, wherein the rate limit is a set power consumption limit of power flow out of the mains power supply in a forward direction.

5. The method of claim 4, wherein the set power consumption limit is an upper limit.

6. The method of claim 4, wherein the set power consumption limit is a lower limit.

7. The method of claim 6, wherein the set power consumption lower limit is at or close to 0 kW, so as to approximately balance the rate of supply of power from the inverter energy system with the rate of power use by the site load.

8. The method of claim 5, wherein the inverter energy system includes two or more inverter energy strings, the upper power consumption limit selected to be at or larger than the expected maximum power supply from an inverter of one of the inverter energy strings.

9. The method of claim 1, wherein the rate limit is a set power export limit of power flow into the mains power supply.

10. The method of claim 9, wherein the set power export limit is an upper limit of power flow into the mains power supply.

11. The method of claim 10, wherein the rate limit includes a set power consumption limit of power flow out of the mains power supply in a forward direction and the set power export limit.

12. The method of claim 1, wherein control of the supply of energy from the inverter energy system includes mechanically or electrically isolating an inverter of one of a number of inverter energy strings of the inverter energy system.

13. The method of claim 12, wherein the inverter energy system includes two or more inverters and control of the supply of energy from the inverter energy source includes mechanically or electrically isolating one or more of the inverters.

14. The method of claim 13, wherein a first inverter of the inverter energy system is isolated upon reverse power flow or a fault condition being detected at the monitoring point.

15. The method of claim 14, wherein a further inverter of the inverter energy system is isolated upon a fault condition being detected at the monitoring point, but the further inverter is not isolated due to reverse power flow being detected at the monitoring point.

16. The method of claim 1, wherein the inverter energy system includes one or more inverters and control of the supply of energy from the inverter energy system includes electronic control of the power output from one or more of the inverters.

17. The method of claim 16, wherein the control of the supply of energy from the inverter energy system further includes mechanically or electrically isolating one or more of the inverters.

18. The method of claim 16 or claim 17, wherein the electronic control of the power output from an inverter is digital control of the inverters.

19. The method of claim 1, wherein monitoring the forward or reverse power flow into or out of the mains power supply includes sensing the voltage and/or a current to sense the load on the mains power supply.

20. The method of claim 1, wherein the inverter energy system includes two or more inverter energy strings, each inverter energy string comprising a supply of renewable energy connected to an inverter.

21. The method of claim 20, wherein the supply of renewable energy is an array of photovoltaic panels.

22. The method of claim 1, wherein the inverter energy system includes a first inverter energy string and a further inverter energy string, the method including when power is in the forward direction connecting said further inverter energy string to compensate for the usage of load from the mains power supply and when forward power or load decreases isolating said further inverter energy string to prevent over generation from the further energy string above the rate limit.

23. A controllable switch connectable to:

a voltage and/or a current sensing devices to sense a load on a mains power supply; and
a renewable energy source connected to the load including at least one renewable energy supply connected to an inverter energy system including one or more inverters

wherein the controllable switch is operable to monitor, at a monitoring point at the site, the electrical power flow into or out of the mains power supply, and includes a microprocessor programmed for setting a rate limit for power flow into or out of the mains power supply, the controllable switch configured to be connected to the inverter energy system so that the controllable switch is operable to vary the supply of power from the inverter energy system by controlling one or more of the inverters so that the power flow to the load is varied thereby controlling the power flow into or out of the mains power supply within the rate limit.

24. The controllable switch of claim 23, wherein the microprocessor is programmed to control the energising and isolation of a first series comprising at least one renewable energy supply connected to a first inverter, and a further series comprising at least one renewable energy supply connected to a further inverter, via contactors; and wherein said first series and inverter are sized and connected to export renewable energy to the mains power supply, and said further series and said further inverters are switched depending on the load or consumption on the mains power supply reaching the set rate limit for power flow into or out of the mains power supply.

25. The controllable switch of claim 23, including a communications port for communicating with the inverters to ramp the inverters up or down so that the power flow into or out of the mains power supply is controlled to be within the rate limit.

26. A renewable energy generation load compensation system comprising: a mains power supply; a renewable energy source connected to a load, the renewal energy source including at least one renewable energy supply connected to an inverter energy system including one or more inverters comprising: a first series comprising at least one renewable energy supply connected to a first inverter; at least one further series comprising at least one further renewable energy supply connected to a further inverter; and a contactor connected to each said inverter to electrically isolate and connect each said series to and from the system; a controllable switch comprising: a voltage and/or a current sensing devices to sense the load on the mains power supply; an energising means connected to each said contactor to isolate and energise each said series; and a microprocessor programmable to control the energising and isolation of each series; a site power supply network adapted to be connected to either the mains power supply or the renewable energy source; and wherein said first series and inverter are sized and connected to export renewable energy to the mains power supply, and said further series and inverters are controlled to vary the supply of power

from the inverter energy system to the load thereby controlling the power flow into or out of the mains power supply to be within a set rate limit.

27. A renewable energy generation load compensation system comprising: a mains power supply; a renewable energy source connected to a load, the renewal energy source including at least one renewable energy supply connected to an inverter energy system including one or more inverters comprising: a first series comprising at least one renewable energy supply connected to a first inverter; at least one further series comprising at least one further renewable energy supply connected to a further inverter; a controllable switch comprising: a voltage and/or a current sensing devices to sense the load on the mains power supply; a communications link connected to each said inverter; and a microprocessor programmable to control the power output from each inverter via the communications link; a site power supply network adapted to be connected to either the mains power supply or the renewable energy source; and wherein said first series and inverter are sized and connected to export renewable energy to the mains power supply, and the power output from said further series and inverters is controlled to vary the supply of power from the inverter energy system to the load thereby controlling the power flow into or out of the mains power supply to be within a set rate limit.

28. The renewable energy generation load compensation system of claims 26 or 27, wherein the set rate limits are the rate limits of claims 4 to 7.

29. The renewable energy generation load compensation system of claim 26 wherein the microprocessor is programmable to control the energising and isolation of each series.

30. The renewable energy generation load compensation system of claim 26 or claim 27, wherein the switch is designed to continuously measure and monitor both forward and reverse direction of power flow in the mains power supply.