CLAIMS

1. A modular energy system controllable to supply power to a load, comprising:

three arrays, each array comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules comprises an energy source and a converter;

a charge port configured to conduct a DC or single phase AC charge signal; and

routing circuitry connected between the charge port and the three arrays, wherein the routing circuitry is controllable to selectively route the DC or single phase AC charge signal to each of the three arrays.

2. The system of claim 1, further comprising a control system communicatively coupled with the routing circuitry, wherein the control system is configured to control the routing circuitry to selectively route the DC or single phase AC charge signal to each of the three arrays.

3. The system of claim 2, wherein the control system is communicatively coupled with each module of the three arrays and is configured to control the converter of each module to charge each module.

4. The system of claim 3, wherein the control system is configured to control the converters of each module according to a pulse width modulation or hysteresis technique.

5. The system of claim 3, wherein each module comprises monitor circuitry configured to monitor status information of the module, wherein each module is configured to output the status information to the control system, and wherein the control system is configured to control the converter of each module based on the status information.

6. The system of claim 5, wherein the status information relates to temperature and state of charge of the module, and wherein the control system is configured to control the converter of each module to balance temperature and state of charge of all modules of the arrays.

7. The system of claim 2, wherein the routing circuitry comprises a plurality of unidirectional solid-state relays controllable by the control system to selectively route the DC charge signal to each of the three arrays.

8. The system of claim 2, wherein the routing circuitry comprises a plurality of bidirectional solid-state relays controllable by the control system to selectively route the DC or single phase AC charge signal to each of the three arrays.

9. The system of claim 2, wherein the charge port is configured to conduct a three phase AC charge signal, and the routing circuitry comprises a plurality of bidirectional solid-state relays controllable by the control system to selectively route the DC or single phase AC charge signal to each of the three arrays.

10. The system of any of claims 7-9, further configured to selectively disconnect all modules and motors from a charge source.

11. The system of any of claims 1-10, wherein the three arrays are interconnected in a delta series configuration.

12. The system of any of claims 1-10, wherein the load is a six phase load, the three arrays are a first set of arrays, and the system further comprises a second set of arrays comprising an additional three arrays of modules, wherein the system is configured to charge the first and second set of arrays in parallel.

13. The system of any of claims 1-8, wherein the charge port is a first charge port, the system further comprising a second charge port configured to receive a three-phase charge signal.

14. The system of claim 13, wherein the first and second charge ports are integrated in the same user accessible location.

15. The system of claim 13, wherein the routing circuitry is connected to lines from the second charge port.

16. The system of any of claims 1-15, comprising a plurality of switches coupled between a first module of each array and the load, wherein the plurality of switches are controllable to disconnect the load from the three arrays.

17. The system of any of claims 1-16, wherein the three arrays are of a first subsystem of the system configured to provide three-phase power to a first load, the system further comprising a second subsystem configured to provide three-phase power to a second load, wherein the second subsystem comprises three arrays each comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules of the second subsystem comprises an energy source and a converter,

wherein the first and second subsystems are coupled together by a first plurality of switches such that the first and second subsystems are electrically connectable in parallel for charging.

18. The system of claim 17, further comprising a third subsystem configured to provide three-phase power to a third load, wherein the third subsystem comprises three arrays

each comprising at least two modules electrically connected together to output an AC voltage signal comprising a superposition of output voltages from each of the at least two modules, wherein each of the modules of the third subsystem comprises an energy source and a converter,

wherein the first and third subsystems are coupled together by a second plurality of switches such that the first and third subsystems are electrically connectable in parallel for charging.

19. A method of charging a modular energy system configured in accordance with any of claims 1-18, comprising:

controlling the modular energy system while a charge signal is applied to charge the modular energy system and to balance at least one operating characteristic of the system.

20. The method of claim 19, wherein the at least one operating characteristic is temperature.

21. The method of claim 19, wherein the charge signal is a three-phase charge signal, a single phase charge signal, or a direct current (DC) charge signal.

22. The method of claim 19, wherein the modular energy system is controlled to maintain a power factor of the system within a threshold of unity.

23. The method of claim 19, wherein controlling the modular energy system comprises controlling converters of modules of the energy system.

24. A control system for a modular energy system configured in accordance with any of claims 1-18.

25. A computer readable medium comprising a plurality of instructions that, when executed by processing circuitry, cause the processing circuitry to control charging for a modular energy system configured in accordance with any of claims 1-18.