

CLAIMS:

1. A method for managing a microgrid (200), the method comprising:

receiving (702) status data from a set of microgrid controller elements (209) connected in a peer-to-peer controller network connecting the set of microgrid controller elements within a microgrid local area network (222) of a microgrid;

responsive to the status data indicating a change in the microgrid that exceeds a threshold level (704), re-aligning (706) the set of microgrid controller elements and a set of tasks associated with the set of microgrid controller elements to form a re-aligned microgrid configuration;

executing (708) the re-aligned microgrid configuration; and

receiving status data from a set of distributed energy resource cluster processors (202, 204, 206, 208) connected in a peer-to-peer processor network within the microgrid local area network.

2. The method of claim 1 further comprising:

sending the status data generated by a first controller element on the microgrid (200) to a second controller element in the set of microgrid controller elements (209); and

sending the status data generated by the controller element on the microgrid to every processor in a set of distributed energy resource cluster processors (202, 204, 206, 208) on the microgrid using a peer-to-peer processor network.

3. The method of claim 1 further comprising:

sending processor status data generated by a first distributed energy cluster processor on the microgrid (200) to each controller element in the set of microgrid controller elements (209); and

sending the processor status data generated by the distributed energy cluster processor to a second processor in a set of distributed energy resource cluster processors on the microgrid using a peer-to-peer processor network.

4. An apparatus comprising:

a microgrid (200) having a set of microgrid elements (209);

a microgrid controller (226) associated with the microgrid configured to initialize a first configuration of the microgrid; verify an address for each element in the set of microgrid elements; re-align the set of microgrid elements to form a second grid configuration in response to receiving status data from the set of microgrid elements connected in a peer-to-peer network that indicates a reconfiguration of the microgrid;; and execute the second grid configuration;

wherein the peer-to-peer network is a network within a local area network (222) and wherein the peer-to-peer network further comprises:

a peer-to-peer redundant ring controller network (418) sending the status data generated by a controller element within the set of microgrid elements to a set of distributed energy resource processors (202, 204, 206, 208) on the microgrid using the peer-to-peer local area network; and

a peer-to-peer processor network sending the status data generated by a distributed energy cluster processor

to every processor in the set of distributed energy resource processors.

5. The apparatus of claim 4 further comprising:

a set of two routers (444,446) connected to a processor (402) in a distributed energy resource cluster (400) within the microgrid (200).

6. The apparatus of claim 4, wherein the set of elements (209) comprises at least one of a sensor associated with the distributed energy resource, a controller associated with a distributed energy resource, a processor, a router, and a managed Ethernet switch.

7. A computer program product for configuring a microgrid (200), the computer program product comprising:

a computer recordable storage medium;

program code, stored on the computer recordable storage medium, for initializing a first configuration of the microgrid having a set of microgrid elements (209);

program code, stored on the computer recordable storage medium, for verifying an address for each element in the set of microgrid elements;

program code, stored on the computer recordable storage medium, for re-aligning the set of microgrid elements to form a second grid configuration in response to receiving status data from the set of microgrid elements connected in a peer-to-peer network that indicates a reconfiguration of the microgrid;

program code, stored on the computer recordable storage medium, for executing the second grid configuration; and

program code, stored on the computer recordable storage medium, for receiving status data from a set of

distributed energy resource cluster processors (202, 204, 206, 208) connected in a peer-to-peer processor network within the microgrid local area network (222).