

Claims

1. A method comprising:

orchestrating peer-to-peer communication between power consumption devices over a communication network, each of the power consumption devices being associated with an access device operable to provide communication with other of the consumption devices;

monitoring, using a processor of a computing device, for new event data from the consumption devices, the new event data including information selected from the group consisting of: device location, operating information of the devices, and sensor data from the devices;

analyzing, using the processor, the new event data to determine power consumption behavior of the consumption devices;

anticipating, using the processor, an occurrence of a future event responsive to the analysis in relation to one of the consumption devices;

predicting, using the processor, the outcome of the future event based on analysis of the received new event data in relation to past behavior data of the consumption device; and

communicating the anticipated future event and the predicted outcome to one or more of the other consumption devices to control, using the processor, consumption choices for the one or more of the other consumption devices.

2. The method of claim 1, where anticipating further comprises:

extracting a pattern of power consumption during periods of a day or week from the new event data; and

comparing the pattern with identified patterns stored in relation to events in a database stored in memory.

3. The method of claim 1 or 2, further comprising:

limiting the communication of the anticipated future event and predicted outcome to devices within a defined geographic area.

4. The method of any of the preceding claims, where the future event comprises a surge in power.

5. The method of any of the preceding claims, where the future event comprises a determined consumption of power during a determined period of time, further comprising:

aggregating anticipated events and predicted outcomes from multiple devices over the determined period of time; and

predicting a surge in power at a geographic location at a future moment in time responsive to the aggregated anticipated events and predicted outcomes.

6. The method of any of the preceding claims, where the future event comprises failure of the consumption device.

7. The method of any of the preceding claims, where the analyzing, estimating and predicting occur on a continuous basis.

8. A system comprising:

a processor;

a network interface executable by the processor to monitor for new event data from power consumption devices over a network, the new event data including information selected from the group consisting of: device location, operating information of devices, and sensor data from the devices;

an estimation engine executable by the processor to analyze the new event data to determine power consumption behavior of ~~a one of the~~ consumption devices; and

a predictor executable by the processor to anticipate an occurrence of a future event responsive to the analysis, and to predict the outcome of the future event based on analysis of the new event data in relation to past behavior data of the consumption device;

where the network interface is further operable to communicate the anticipated future event and the predicted outcome to one or more of the other consumption devices to control, using the processor, consumption choices for the one or more of the other consumption devices.

9. The system of claim 8, further comprising multiple access devices in communication with the consumption devices, where the network interface is further operable to receive the new event data from the access devices, and where the access devices are configured to provide communication between the consumption devices.
10. The system of claim 8 or 9, where the predictor is further operable to:
extract a pattern of power consumption during periods of a day or week from the new event data; and
compare the pattern with identified patterns stored in relation to events in a database stored in memory.
11. The system of any of claims 8 to 10, where the network interface is limited to a predefined geographic area in which the network interface communicates the anticipated future event and the predicted outcome.
12. The system of any of claims 8 to 11, where the future event comprises a surge in power.
13. The system of any of claims 8 to 12, where the future event comprises a determined consumption of power during a determined period of time.
14. The system of claim 13, where the predictor is further operable to:
aggregate anticipated events and predicted outcomes from multiple devices over the determined period of time; and
predict a common future event for a group of consumption devices that share a common geographic area.
15. The system of any of claims 8 to 14, where the future event comprises failure of the consumption device.

16. The system of any of claims 8 to 15, where the estimation engine and the predictor are operable to analyze the new event data at a substantially continuous rate.

17. The system of any of claims 8 to 16, further comprising:
an actuator executable by the processor to execute an actuation method comprising taking an action with relation to a power flow to or from the consumption device; and confirming the future event through two-way data communication with the consumption device.

~~18. A method comprising:~~
~~—determining, using a processor of a computing device, power demand from buildings that include power consumption devices connected into a power grid;~~
~~determining an amount of power supply available from power sources that feed the buildings;~~
~~calculating, using the processor, a power demand-supply gap at each of at least some of the buildings;~~
~~forecasting, using the processor, times when and identifying building locations where the power demand-supply gap will increase and when and where the power demand-supply gap will decrease;~~
~~determining, using the processor, one or more paths between a first building where power is forecasted to be needed and power sources that have excess power;~~
~~determining, using the processor, a speed at which the power demand-supply gap is increasing at the first building;~~
~~identifying, using the processor, a nearest power source located along the one or more paths, the nearest power source having excess power supply and being able to close the demand-supply power gap before the first building reaches a blackout condition; and~~
~~sending a command to the nearest power source to transfer some of the excess power to the first building, to alleviate a threat of the blackout condition at the first building.~~

19. —The method of claim 18, further comprising the identified nearest power source transferring the excess power to the first building.

20. —The method of claim 18 or 19, where identifying further comprises:
——identifying the nearest power source that, when commanded to transfer the excess power, will not create a likelihood of a brownout or a blackout at a second building to which the power source provides power.

21. —The method of any of claims 18 to 20, where the power sources are selected from the group consisting of: power distributors, power generators, power collectors and power storage reserves.

22. —The method of any of claims 18 to 21, where the power sources that feed the buildings include renewable energy sources positioned at locations of the buildings.

23. —The method of any of claims 18 to 22, further comprising:
determining a shift in the one or more paths required to avoid an obstacle on the determined one or more paths; and
determining a queue time on each of the determined one or more paths because of the one or more obstacles on the determined optimal paths;
where identifying the nearest power source further comprises considering a needed shift in path over which to send the excess power, and the queue time that will affect the determined speed.

24. —The method of any of claims 18 to 23, where the command is sent to the nearest power source to also alleviate a threat of a brownout condition.

25. —The method of any of claims 18 to 24, where the buildings comprise communities and the first building comprises a first community.