WHAT IS CLAIMED IS:

1. A system comprising:

a power generation system for powering a data center, wherein the power generation system is chosen to be sufficient to meet normal energy needs of all systems within the data center at peak capacity of the power generation system, but insufficient to meet peak energy needs of all of the systems within the data center, and wherein the power generation system operates more efficiently when used at peak capacity than at less than peak capacity of the power generation system;

a battery storage system having a state of charge attribute; and

processing circuitry having access to an electrical power grid, the power generation system, the battery storage system, and a liquid cooling system, wherein the processing circuitry is configured to:

determine an energy utilization forecast for a data center,

monitor energy availability factors,

determine, based on the energy utilization forecast and the monitored energy availability factors, an energy flow configuration defining energy flows involving the electrical power grid, the power generation system, the battery storage system, the liquid cooling system, and the data center, wherein the energy flow configuration includes information identifying, the power generation system, as a primary source of power for the data center with the power generation system used at peak capacity, and wherein the energy flow configuration further defines energy flows associated with stored thermal energy and mandates that the data center is not to be powered by the electrical power grid even when power from the electrical power grid is available,

provide power to the data center based on the energy flow configuration, and

manage energy flows involving the battery storage system based on the energy flow configuration and further involving the stored thermal energy based on the energy flow configuration by cooling water associated with the liquid cooling system, wherein to manage the energy flows, the processing circuitry meets peak energy needs using power from both the power generation system and the battery storage system.

2. The system of claim 1, wherein the power generation system generates electrical power by converting at least one of natural gas or biogas into electricity.

3. The system of claim 1, wherein the battery storage system includes a plurality of lithium ion batteries.

4. The system of claim 1, wherein to determine an energy utilization forecast, the processing circuitry is further configured to:

collect energy utilization information relating to current energy utilization by the data center; and

apply a machine learning model to the energy utilization information to determine the energy utilization forecast, wherein the machine learning model has been trained with historical information about energy utilization by the data center.

5. The system of claim 1, wherein the energy flow configuration includes a desired state of charge value, and wherein to manage the energy flows involving the battery storage system, the processing circuitry is further configured to:

manage the energy flows involving the battery storage system by directing energy to the battery storage system to charge the battery storage system when the desired state of charge value is greater than the state of charge attribute.

6. The system of claim 1, wherein the energy flow configuration includes a desired state of charge value, and wherein to manage the energy flows involving the battery storage system, the processing circuitry is further configured to:

manage the energy flows involving the battery storage system by providing energy to the data center by discharging energy from the battery storage system when the desired state of charge value is less than the state of charge attribute.

7. The system of claim 1, wherein the energy availability factors include one or more of commercial information, environmental information, local monitoring information, power quality information, equipment condition information, weather conditions information, information about news events, information about energy markets, or information about energy costs.

8. The system of claim 1, wherein the energy flow configuration indicates that the data center is to be powered solely by the power generation system.

9. The system of claim 1,

wherein the energy flow configuration indicates that power generated by the power generation system that exceeds needs of the data center is to be used to charge the battery storage system.

10. The system of claim 1, wherein the energy flow configuration indicates that the data center is to be powered by a combination of the power generation system and the battery storage system.

11. The system of claim 1, wherein the processing circuitry is further configured to:

determine an updated energy utilization forecast for the data center;

continue to monitor the energy availability factors;

determine, based on the updated energy utilization forecast and the monitored energy availability factors, an updated energy flow configuration;

provide power to the data center based on the updated energy flow configuration; and

manage energy flows involving the battery storage system based on the updated energy flow configuration.

12. A computing system configured to:

determine an energy utilization forecast for a data center;

monitor energy availability factors;

determine, based on the energy utilization forecast and the monitored energy availability factors, an energy flow configuration defining energy flows involving an electrical power grid, a power generation system, a battery storage system, a liquid cooling system, and the data center, wherein the power generation system is chosen for the data

center to be sufficient to meet normal energy needs of the data center at peak capacity of the power generation system, but insufficient to meet peak energy needs of the data center, wherein the power generation system operates more efficiently when used at peak capacity than at less than peak capacity of the power generation system, and wherein the energy flow configuration includes information identifying the power generation system as a primary source of power for the data center with the power generation system used at peak capacity, and wherein the energy flow configuration further defines energy flows associated with stored thermal energy and mandates that the data center is not to be powered by the electrical power grid even when power from the electrical power grid is available;

provide power to the data center based on the energy flow configuration; and

manage energy flows involving the battery storage system based on the energy flow configuration and further involving the stored thermal energy based on the energy flow configuration by cooling water associated with the liquid cooling system, wherein to manage the energy flows, the computing system meets peak energy needs using power from both the power generation system and the battery storage system.

13. A method comprising:

determining, by an energy management system, an energy utilization forecast for a data center;

monitoring, by the energy management system, energy availability factors;

determining, by the energy management system and based on the energy utilization forecast and the monitored energy availability factors, an energy flow configuration defining energy flows involving with an electrical power grid, a power generation system, a battery storage system, a liquid cooling system, and the data center, wherein the power generation system is chosen for the data center to be sufficient to meet normal energy needs of the data center at peak capacity of the power generation system, but insufficient to meet peak energy needs of the data center, wherein the power generation system operates more efficiently when used at peak capacity than at less than peak capacity of the power generation system, and wherein the energy flow configuration includes information identifying the power generation system as a primary source of power for the data center with the power generation system used at peak capacity, and wherein the energy flow configuration further defines energy flows associated with stored thermal energy and mandates that the data center is not to be powered by the electrical power grid even when power from the electrical power grid is available;

providing, by the energy management system, power to the data center based on the energy flow configuration; and

managing, by the energy management system, energy flows involving the battery storage system based on the energy flow configuration and further involving the stored thermal energy based on the energy flow configuration by cooling water associated with the liquid cooling system, wherein managing energy flows includes meeting peak energy needs using power from both the power generation system and the battery storage system.

14. The method of claim 13, wherein determining an energy utilization forecast includes:

collecting energy utilization information relating to current energy utilization by the data center; and

applying a machine learning model to the energy utilization information to determine the energy utilization forecast, wherein the machine learning model has been trained with historical information about energy utilization by the data center.

15. The method of claim 13, wherein the energy flow configuration includes a desired state of charge value, and managing the energy flows involving the battery storage system includes:

managing the energy flows involving the battery storage system by directing energy to the battery storage system to charge the battery storage system when the desired state of charge value is greater than the state of charge attribute.

16. The method of claim 13, wherein the energy flow configuration includes a desired state of charge value, and wherein managing the energy flows involving the battery storage system includes:

managing the energy flows involving the battery storage system by providing energy to the data center by discharging energy from the battery storage system when the desired state of charge value is less than the state of charge attribute.

17. The method of claim 13, wherein the energy availability factors include one or more of commercial information, environmental information, local monitoring information, power quality information, equipment condition information, weather conditions information, information about news events, information about energy markets, or information about energy costs.

18. A non-transitory computer-readable storage medium comprising instructions that, when executed, configure processing circuitry of a computing system to:

determine an energy utilization forecast for a data center;

monitor energy availability factors;

determine, based on the energy utilization forecast and the monitored energy availability factors, an energy flow configuration defining energy flows involving an electrical power grid, a power generation system, a battery storage system, a liquid cooling system, and the data center, wherein the power generation system is chosen for the data center to be sufficient to meet normal energy needs of the data center at peak capacity of the power generation system, but insufficient to meet peak energy needs of the data center, wherein the power generation system operates more efficiently when used at peak capacity than at less than peak capacity of the power generation system, and wherein the energy flow configuration includes information identifying the power generation system as a primary source of power for the data center with the power generation system used at peak capacity, and wherein the energy flow configuration further defines energy flows associated with stored thermal energy and mandates that the data center is not to be powered by the electrical power grid even when power from the electrical power grid is available;

provide power to the data center based on the energy flow configuration; and

manage energy flows involving the battery storage system based on the energy flow configuration and further involving the stored thermal energy based on the energy flow configuration by cooling water associated with the liquid cooling system, wherein to manage the energy flows, the processing circuitry meets peak energy needs using power from both the power generation system and the battery storage system.