CLAIMS

What is claimed is:

1. A power regulator comprising:

a plurality of harvester switches, each coupled to receive energy from a separate energy source;

a plurality of load switches, each coupled to supply power to a separate load;

an inductor to store energy received from one or more of the energy sources and release the energy to supply the power to one or more of the loads; and

a controller to control charging of the inductor via activation of one or more of the harvester switches and discharging of the inductor via activation of one or more of the load switches, wherein the controller is to generate asynchronous energy pulses to regulate load voltages of the one or more loads, and wherein the controller comprises:

a plurality of load comparators to compare a load output voltage of each load to a reference voltage;

a control unit to enable an energy pulse if one or more of the load comparators detect that one or more of the load output voltages is below the reference voltage; and

a pulse generator having a counter, wherein the pulse generator is to generate the energy pulse of the asynchronous energy pulses for a length of time proportional to a stored count value.

2. The power regulator of claim 1, wherein the controller time multiplexes the activation of the harvester switches to charge the inductor to regulate the load voltage corresponding to each of the energy sources.

3. The power regulator of claim 2, wherein the controller time multiplexes the activation of the load switches to discharge the inductor to regulate the load voltage corresponding to each of the loads.

4. The power regulator of claim 3, further comprising a battery switch to receive the energy from a battery, wherein the controller further activates the battery switch and one or more of the load switches to regulate the load voltages.

5. The power regulator of claim 4, wherein the controller activates the battery switch, the harvester switches and the load switches to regulate the load voltages.

6. The power regulator of claim 5, wherein the controller activates the battery switch, and deactivates the harvester switches and the load switches to charge the inductor.

7. The power regulator of claim 6, wherein the controller activates the battery switch and the harvester switches, and deactivates the load switches to charge the inductor.

8. The power regulator of claim 7, wherein the controller activates the harvester switches, and deactivates the battery switch and the load switches to charge the battery.

9. The power regulator of claim 4, wherein the controller comprises:

a zero current detector (ZCD) to detect zero current at the inductor;

a plurality of harvester comparators, each to compare a voltage received from each energy source to a maximum power voltage;

a plurality of load comparators, each to compare the load voltage of each load to a reference voltage; and

a control unit to control activation of the harvester switches and the load switches based on the current detected by the ZCD at the inductor.

10. The power regulator of claim 9, wherein the controller comprises battery comparators to compare a voltage received from the battery, wherein the controller monitors the battery comparators to prevent overcharging of the battery.

11. The power regulator of claim 1, wherein the controller further comprises a zero current detector (ZCD) to detect zero current at the inductor, wherein a count value at the counter is incremented upon detection of zero current at the ZCD and a determination that one or more of the load output voltages is below the reference voltage reference voltage.

12. The power regulator of claim 11, wherein the count value at the counter is decremented upon detection of the zero current and a determination that no load output voltage is below the reference voltage reference voltage.

13. A power regulator comprising:

a switch to receive energy from an energy source;

a plurality of load switches, each coupled to supply power to a separate load;

an inductor to store energy received from the energy source during activation of one or more of a plurality of harvester switches and release the energy during activation of one or more of the load switches; and

a controller to generate asynchronous energy pulses to regulate power voltage to the loads, wherein the controller comprises:

a zero current detector (ZCD) to detect zero current at the inductor;

a plurality of load comparators to compare an output voltage of each load to a reference voltage; and

pulse generator to generate an energy pulse if one or more of the load comparators detect that one or more of the load output voltages is below the reference voltage, and wherein the pulse generator comprises a counter, wherein the pulse generator is to generate the energy pulse of the asynchronous energy pulses for a length of time proportional to a count value stored in the counter.

14. The power regulator of claim 13, wherein the counter increments a count value upon detection of the zero current at the ZCD and a determination that one or more of the load output voltages is below the reference voltage reference voltage.

15. The power regulator of claim 14, wherein the counter decrements the count value upon the detection of the zero current and a determination that no load output voltage is below the reference voltage reference voltage.