CLAIMS

1. A system for powering an accessory device with power generated on a floating solar photovoltaic (PV) array, comprising:

(a) a plurality of PV modules;

(b) a plurality of floating pontoons for supporting the PV modules above the water;

(c) an inverter for receiving DC power from the PV modules and converting the DC power to AC power, wherein the inverter has an AC power limit such that any power received above the AC Power limit would be clipped by the inverter;

(d) at least one powered accessory device;

(e) a power line running from the floating solar array to an on-shore grid; and

(f) an energy management power control system configured to send power that has been clipped by the inverter to the at least one powered accessory device, wherein the energy management power control system is configured to send power to the at least one powered accessory device by adjustably changing the amounts of power received from each of the following power sources over a period of time:

power received from the PV modules that has been clipped by the inverter,

power received from the PV modules that has not been clipped by the inverter, and

power received from the on-shore grid.

2. The system of claim 1, wherein the energy management power control system is further configured to send power that has not been clipped by the inverter to the at least one powered accessory device.

3. The system of claim 1, wherein the energy management power control system is further configured to receive power through the power line running from the floating solar array to the on-shore grid to send power to the at least one powered accessory device.

4. The system of claim 1, wherein the powered accessory device is a water quality device, being one or more of an aerator, a diffuser, a sub-surface agitator, a sub-surface water circulator, or a water quality sensor.

5. The system of claim 1, wherein the powered accessory device is an air compressor for inflating the plurality of pontoons.

6. The system of claim 1, wherein the powered accessory device is a positional mooring device.

7. The system of claim 1, wherein the powered accessory device is a panel washer, or a bird removal system.

8. The system of claim 1, wherein the plurality of floating pontoons comprise:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon and

a plurality of inflatable lower support pontoons with lower mounting hardware thereon,

wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons, and

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle.

9. A system for powering an accessory device with power generated on a floating solar photovoltaic (PV) array, comprising:

(a) a plurality of PV modules;

(b) a plurality of floating pontoons for supporting the PV modules above the water;

(c) an inverter for receiving DC power from the PV modules and converting the DC power to AC power, wherein the inverter has an AC power limit such that any power received above the AC Power limit would be clipped by the inverter;

(d) at least one powered accessory device;

(e) a power line running from the floating solar array to an on-shore grid;

(f) an energy management power control system configured to send power that has been clipped by the inverter to the at least one powered accessory device;

wherein the plurality of floating pontoons comprise:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon and

a plurality of inflatable lower support pontoons with lower mounting hardware

thereon,

wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons, and

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

(g) an air manifold system, comprising:

at least one of an air source or an air compressor, and

pneumatic tubing connecting the air source or air compressor to each of the plurality of inflatable support pontoons;

pressure sensors for determining air pressures in the inflatable support pontoons; and

an air manifold control system for controlling the air pressures in the inflatable support pontoons.

10. A system for powering an accessory device with power generated on a floating solar photovoltaic (PV) array, comprising:

(a) a plurality of PV modules;

(b) a plurality of floating pontoons for supporting the PV modules above the water;

(c) an inverter for receiving DC power from the PV modules and converting the DC power to AC power, wherein the inverter has an AC power limit such that any power received above the AC Power limit would be clipped by the inverter;

(d) at least one powered accessory device;

(e) a power line running from the floating solar array to an on-shore grid;

(f) an energy management power control system configured to send power that has been clipped by the inverter to the at least one powered accessory device;

wherein the plurality of floating pontoons comprise:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon and

a plurality of inflatable lower support pontoons with lower mounting hardware thereon,

wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons, and

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

wherein the inclined angle of each of the solar photovoltaic modules is adjusted by adjusting an inflation level in one of the inflatable upper support pontoons.

11. A floating solar photovoltaic array, comprising:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon;

a plurality of inflatable lower support pontoons with lower mounting hardware thereon; and

a plurality of solar photovoltaic modules, wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons,

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

an air manifold system, comprising:

at least one of an air source or an air compressor, and

pneumatic tubing connecting the air source or air compressor to each of the plurality of inflatable support pontoons;

pressure sensors for determining air pressures in the inflatable support pontoons; and

an air manifold control system for controlling the air pressures in the inflatable support pontoons.

12. The floating solar photovoltaic array of claim 11, wherein the air manifold system is powered by the photovoltaic modules in the solar photovoltaic array.

13. A floating solar photovoltaic array, comprising:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon;

a plurality of inflatable lower support pontoons with lower mounting hardware thereon; and

a plurality of solar photovoltaic modules, wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons,

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

wherein the inclined angle of each of the solar photovoltaic modules is adjusted by adjusting an inflation level in one of the inflatable upper support pontoons.

14. A floating solar photovoltaic array, comprising:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon;

a plurality of inflatable lower support pontoons with lower mounting hardware thereon; and

a plurality of solar photovoltaic modules, wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons,

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

wherein the lower support pontoons have a flattened top surface functioning as a walkway.

15. A floating solar photovoltaic array, comprising:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon;

a plurality of inflatable lower support pontoons with lower mounting hardware thereon; and

a plurality of solar photovoltaic modules, wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons,

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

wherein a center portion of each solar photovoltaic module is positioned directly above water with no mechanical structure positioned directly thereunder.

16. A floating solar photovoltaic array, comprising:

a plurality of inflatable upper support pontoons with upper mounting hardware thereon;

a plurality of inflatable lower support pontoons with lower mounting hardware thereon; and

a plurality of solar photovoltaic modules, wherein each solar photovoltaic module has an upper end that is connected to the mounting hardware on one of the inflatable upper support pontoons and a lower end that is connected to the mounting hardware on one of the inflatable lower support pontoons,

wherein the mounting hardware on the inflatable upper support pontoons is higher than the mounting hardware on the inflatable lower support pontoons to thereby hold each of the solar photovoltaic modules at an inclined angle; and

a powered accessory comprising at least one of an aerator, a diffuser, a sub-surface agitator, a sub-surface water circulator, a sub-surface positioning system, a water quality sensor; a panel washer, or a bird removal system,

wherein the powered accessory is powered by the photovoltaic modules in the solar photovoltaic array.

17. The floating solar photovoltaic array of claim 16, further comprising:

at least one inverter on the array for converting DC output from the solar photovoltaic modules into AC power, and

an AC bus on the array connected to the inverter for sending AC power to an on-shore grid,

wherein the powered accessory is connected to the AC bus.

18. The floating solar photovoltaic array of claim 16, further comprising:

at least one on-shore inverter for converting DC output from the solar photovoltaic modules into AC power, and a DC bus on the array for sending DC power to the on-shore

inverter,

wherein the powered accessory is connected to the DC bus.

19. The floating solar photovoltaic array of claim 16, further comprising:

at least one inverter that converts DC output from the solar photovoltaic modules into AC power, wherein the powered accessory is powered by output from the solar photovoltaic modules that has been clipped by the at least one inverter.

20. The floating solar photovoltaic array of claim 16, further comprising:

a battery on the array,

wherein the powered accessory is powered by the battery at times when the powered accessory is not being powered by the photovoltaic modules in the solar photovoltaic array.

21. The floating solar photovoltaic array of claim 16, further comprising:

a plurality of mooring cables connected to at least one of the plurality of inflatable upper support pontoons or the inflatable lower support pontoons for mooring the array at a desired location on a body of water.