CLAIMS

[Claim 1]

A greenhouse comprising:

a plurality of roof supports;

a pair of brackets suspended underneath each of the plurality of roof supports;

a bi-facial solar panel attached to the pair of brackets underneath the plurality of roof supports;

a pair of reflector rails suspended underneath each of the plurality of roof supports; and

a dichroic reflector attached to the pair of reflector rails, the dichroic reflector being directly below the bi-facial solar panel,

wherein the dichroic reflector maintains a space from the bi-facial solar panel,

wherein the dichroic reflector is configured to concentrate and reflect solar irradiation having a selective wavelength band between about 700 nanometers and about 1100 nanometers, and

wherein the dichroic reflector is further configured to pass incident solar irradiation having a wavelength shorter than about 700 nanometers and longer than 1100 nanometers to pass through the dichroic reflector.

[Claim 2]

The greenhouse according to claim 1, wherein each of the pair of brackets is attached between the pair of reflector rails.

[Claim 3]

The greenhouse according to claim 1 or 2, wherein the pair of reflector rails extend between adjacent roof supports of the plurality of roof supports.

[Claim 4]

The greenhouse according to any one of claims 1 to 3, wherein a width of the bi-facial solar panel is between about 14% and about 50% of a width between the pair of reflector rails.

[Claim 5]

The greenhouse according to any one of claims 1 to 3, wherein a width of the bi-facial solar panel is between about 14% and about 50% of a width between the pair of reflector rails when the reflector rails are attached to the roof supports.

[Claim 6]

The greenhouse according to any one of claims 1 to 5, wherein the bi-facial solar panel comprises a string of bi-facial half cells connected in series.

[Claim 7]

The greenhouse according to any one of claims 1 to 6, wherein the dichroic reflector has a width larger than a distance between the pair of reflector rails.

[Claim 8]

The greenhouse according to any one of claims 1 to 7, wherein the dichroic reflector has an arcuate cross section.

[Claim 9]

The greenhouse according to any one of claims 1 to 8, wherein the dichroic reflector is slidable along the pair of reflector rails.

[Claim 10]

The greenhouse according to any one of claims 1 to 9, wherein the bi-facial solar panel is slidable along the pair of brackets.

[Claim 11]

The greenhouse according to any one of claims 1 to 10, wherein the bi-facial solar panel plus the dichroic reflector has a field of view larger than a daily and seasonal elevation angle range of the sun at a location of the greenhouse.

[Claim 12]

The greenhouse according to claim 11, wherein the field of view is ±23.5°.

[Claim 13]

The greenhouse according to any one of claims 1 to 12, wherein the bi-facial solar panel has a bifaciality factor of at least 85%.

[Claim 14]

A greenhouse comprising:

a plurality of roof supports:

a pair of brackets fixedly attached to and extending downwardly from each of the plurality of roof supports each of the pair of brackets comprising:

a top leg engaged with at least one of the plurality of roof supports;

a rib extending downwardly from each top leg; and

a bottom leg extending from each rib such that each bottom leg of each bracket of the pair of brackets faces the bottom leg of the other bracket of the pair of brackets;

a bi-facial solar panel supported by the bottom leg of each of the pair of brackets;

a rail bracket fixedly attached to and extending downwardly from the plurality of roof supports;

a pair of reflector rails attached to the rail bracket, each of the pair of reflector rails having a generally C-shaped cross section having a slot formed therein; and

a separate dichroic reflector attached to each of the pair of reflector rails such that an edge of each dichroic reflector is inserted into the slot of one of the pair of reflector rails,

wherein the pair of brackets is attached to a respective one of the plurality of roof supports such that the pair of brackets is between the pair of reflector rails such that the bi-facial solar panel is directly above the dichroic reflector.