CLAIMS

1. A system comprising a biomass growth module (BGM) and:

a. a thermal plant module producing an exhaust gas comprising carbon dioxide optionally fueling the BGM;

b. wherein the thermal plant module is optionally fuelable by a BGM outflow fluid from the BGM;

c. wherein the BGM outflow fluid is optionally refined in whole or in part optionally by heat from the thermal plant module; and

d. wherein the exhaust gas optionally may provide a substantial portion of the carbon content of the BGM outflow fluid.

2. The system of claim 1 wherein;

(i) the BGM is configured to be supplied by BGM feed water which is optionally pretreated and comprising:

a. salt water;

b. fresh water;

c. high salinity water;

d. wastewater;

e. any source of water;

f. another water type(s); and/or

g. a combination thereof, wherein the BGM feed water is optionally processed through a primary treatment process, also referred to as "primary treatment", before being supplied to the BGM, optionally wherein the primary treatment process comprises:

a. screening;

b. grit removal;

c. sedimentation;

d. addition of chemicals;

e. and/or other means to prepare water for introduction into a BGM; and

optionally wherein sludge from the primary treatment process is optionally supplied to a gasification module;

(ii) the BGM is configured to produce a biofuel, which biofuel supplies the thermal plant module either directly or after additional processing;

(iii) wherein the BGM outflow fluid is optionally processed before optionally fueling the thermal plant module, and wherein the BGM outflow fluid is optionally being supplied to a gasification module, a biomass processing plant (BPP) module and/or a water bottling/biomass product bottling/packaging plant (BBPP) module, wherein the BGM outflow fluid is processed by:

a. a tertiary treatment module;

b. a gravity thickener to concentrate, and separate the BGM outflow fluid;

c. a dilution module;

d. a refinery module;

e. processing; and/or

f. a heat recovery module;

optionally wherein the tertiary treatment module is configured to supply a biomass/water slurry to the gravity thickener to concentrate, separate, and/or dilute the BGM outflow fluid;

(iv) the thermal plant module is configured to optionally provide heat and/or cooling to the following:

a. the refinery module;

b. a BPP module;

c. biomass products;

d. a BBPP module;

e. the BGM;

f. the gasification module;

g. processing of biofuel; and/or

h. a desalination module;

optionally wherein in (iii) or (iv) the water that is the result of the tertiary treatment is routed for water reuse and/or optional recirculation to the BGM; and

optionally wherein the gravity thickener in (iii) to concentrate, separate, and/or dilute the BGM outflow fluid comprises:

a. a water, biomass and/or extract output;

b. a treated biomass/water slurry output (also defined as a BGM outflow fluid); and/or

c. a water output;

and advantageously any portion of the treated biomass/water slurry is directed to:

a. the refinery module; and/or

b. the gasification module;

preferably wherein the water, biomass, and/or an extract thereof is supplied to the BPP module; or

wherein the water output from the gravity thickener to concentrate, separate, and/or dilute the BGM outflow fluid is routed for water reuse.

(v) in any of (iii) or (iv) the BPP module comprises:

a. biomass products outputs which are optionally routed to a BBPP module;

b. heat, water, and/or carbon dioxide outputs which are optionally routed for reuse; and/or

c. residuals optionally routed to the refinery module;

optionally wherein the refinery module receives optional inputs selected from:

a. other biomass source(s);

b. other waste; and/or

c. pressure.

further optionally wherein the refinery module has optional outputs selected from:

a. biocrude;

b. biofuel;

c. water; and/or

d. residuals.

preferably wherein the biocrude and/or biofuel outputs from the refinery module serve in whole or in part as the BGM outflow fluid output which output optionally fuels the thermal plant module,

wherein the biocrude and/or biofuel outputs from the refinery module undergo additional steps selected from the following before optionally fueling the thermal plant module:

a. a heat recovery module; and/or

b. processing;

suitably wherein the refinery module generates residuals which are optionally sent to a gasification module.

(vi) the gasification module produces a biogas output, which is optionally further processed, or wherein the biogas output optionally partially or fully fuels the thermal plant module, or wherein the gasification module produces a residuals output (and optionally wherein the residuals output is supplied to the BGM).

(vii) in (v) the refinery module's water output is directed to an optional heat and/or pressure recovery module, optionally wherein the heat and/or pressure recovery module produces a water output wherein the water is reused;

(viii) the thermal plant module optionally provides power to the Plan.

3. A method of integrating a thermal plant and a BGM comprising: providing the system of claim 1 and generating a biomass in the BGM.

4. The method of claim 3 further comprising:

a. refining the biomass to a biofuel;

b. delivering the biomass to the thermal plant;

c. delivering the biofuel to the thermal plant;

d. combusting the biofuel in the thermal plant;

e. delivering thermal plant exhaust gas to the BGM;

f. processing the biomass into non-fuel products; and/or

g. removing pollutants from the thermal plant exhaust gas.

5. A system configured for biomass growth comprising a biomass growth module (BGM) according to claim 1 wherein the BGM comprises one or more biomass growth units (BGUs) selected from the following configurations:

a) single;

b) dual serial;

c) dual parallel;

d) dual parallel connected;

e) serial simple networked; and/or

f) complex networked.

6. The system of claim 5 wherein any one or more of the BGUs is:

a) an autotrophic BGU;

b) a heterotrophic BGU; and/or

c) a mixotrophic BGU; and/or

wherein any of the BGUs may share and/or exchange inputs and/or outputs optionally comprising:

a) carbon dioxide;

b) oxygen;

c) water;

d) nutrients;

e) biomass;

f) growth medium;

g) solvent;

h) carbon source;

i) nitrogen or other gases; and/or

j) light source(s).

7. A method for growing biomass comprising networking a set of biomass growth units in a biomass growth module (BGM) according to claim 1 wherein the set comprises a biomass growth unit which is:

a) a single biomass growth unit;

b) a dual serial biomass growth unit;

c) a dual parallel biomass growth unit;

d) dual parallel connected biomass growth unit;

e) serial simple networked biomass growth unit; and/or

f) complex networked biomass growth unit.

8. The method of claim 7, wherein any one or more of the BGUs is operating:

a) autotrophically;

b) heterotrophically; and/or

c) mixotrophically; and/or

wherein any of the BGUs is sharing and/or exchanging inputs and/or outputs optionally comprising:

k) carbon dioxide;

l) oxygen;

m) water;

n) nutrients;

o) biomass;

p) growth medium;

q) solvent;

r) carbon source;

s) nitrogen or other gases; and/or

t) light source(s).