FOREWORD
Plan to organize a World-wide Green Carbon Consortium

Ladies and Gentlemen,
I, you and the rest of us continue to be led around by our respective noses by a determined group of ***oligarchs*** to prolong their grip on the control of the events in our world.

Enough is enough !!

The following is a description of a proposed solution to the worsening predicament we are now experiencing on our planet and how to free ourselves from the grip of these people.
The way to this achievement is based on 40 years of innovation and industrial realization whereby a selection of the latest accompanying intellectual property are the following:

>**GB 2465762 dated 2 Nov. 2011 "Universal fluid purification systems"**
Download (www.ipo.gov.uk)
and
>GB 2460982 dated 11.May 2011 "Systems of total capture and recycling of used organic and inorganic matter of self-sustainable human settlements"
>GB 2490047 dated 3.Feb. 2016 "Global recycling of the earth´s natural resources".
Download www.miller-carbon-cycle.org

Background
Download: www.miller-filter.de

This presentation starts with a short CV (Curriculum Vitae) of the present author and inventor.
I am taking this approach for the following reasons:

1. **to ensure readers that it is almost certain that none of the discussed central technical aspects of this presentation can be challenged concerning their authenticity or origin**
2. **to pave the way for united UN member countries to participate in a Research & Development action to realize a global solution to the present environmental disasters we are now experiencing.**

The **recent climate change meeting in Paris** was truly a repeat performance of past multiple conventions of this nature over decades and centuries with no obvious signs of any meaningful outcome.
These conventions could have been arranged and carried out by the fossil carbon giants as advertising campaigns for their continued dominance of the scene.

Not only is there still no convincing solution to the worst global environmental problems, but **the great irony of all is that the carbon dioxide that is being increasingly demonized is according to this presentation *the main component of a solution to the entire global environmental problem* !! As the heading suggests, the best way to achieve this goal is to have all member countries of the UN join in a concerted effort to solve the global problem once and for all!**

An earlier project to produce the capability of destroying the world was known as the “Manhattan-Project” that has resulted in the present storage of thousands of atomic bombs ready to wipe out all signs of life on our planet many times over and perhaps further afield. It would be more than appropriate if as a partial-goal of the present suggested project, these and other deadly weapons would be replaced by systems such as **“GREEN CARBON”** that could guarantee peaceful pollution-free, societies throughout the world.

It is central to the following proposal that all present and future intellectual property should be legally exploited by each individual member country of the United Nations according and adapted to their individual needs!

In effect such intellectual property organization(s) as WIPO (World Intellectual Property Office) would not be involved, whereby an agreement leading to a contract with all UN member countries would be individually reached giving each of them the sole right without charge to exploit all innovative technology named or described in patent format in this publication.

Technological Development

Key universities or R&D establishments in a number of countries could be approached to carry out the following development stages:

1. **Laboratory investigations and testing**
2. **Pilot-scale realization leading to**
3. **Large scale industrial realization**

The cost of these development stages could be shared by the entire United Nations national membership according to their GNP/head of population.

Central to the solution is the necessity for nations of the world (the people of the world) irrespective of religious beliefs or race to cooperate!

Brief CV

Peter A Miller

GB-Gillingham / Dorset/UK

- **1960 to present**

BSc. App.(Indus. Chem.)
Post-Grad. Dipl. Sugar Technology
Queensland University
AUSTRALIA

Occupation: Chemical Engineer

- Australian Estates, Sugar Ind.
- Monsanto, Melbourne, Australia
- Monsanto, St. Louis, USA
- Paterson Engineering Co, London, UK
- Ecological Institute, Bonn, Germany
- Universal Oil Products, Hanau, Germany

- **Seventies**
  Miller Filter Firms founded
  UK/Germany
  Prototypes
  Sales

- **Eighties**
  Further development and sales
  UK/Germany

Selection of MillerFilter Installations

1975-1990

CHEMICAL / PHARMACEUTICAL

Bayer AG, Leverkusen
Hickson & Welch, GB-Castleford
BASF, Ludwigshafen
De Beers, Rep. Ireland
Ciba-Geigy, CH-Basel
Merck, D- Darmstadt
Glaxochem, Ulverston
Dista Products, GB-Speke
Behringwerke, D-Marburg
Degussa, D-Hanau
Sandoz, CH-Basel
INCO, GB-London
Hoechts AG, Frankfurt
Philips, NL-Maarheze

BEVERAGES

Söhnlein Sektkellerei, D-Wiesbaden
Kupferberg & Cie, D-Mainz
Henkell Sektkellerei, D-Wiesbaden
Schloß Böchingen, D-Böchingen

FOOD

Milk Marketing Board, UK
Unilever, GB-Port Sunlight
Schmidt Söhne, D-Odenheim

METAL WORKING

SKF, D-Schweinfurt
Ina Schäffler, D-Herzogenaurach
BMW, D-München
Peddinghaus, D-Ennepetal
Schiess/Nassovia, D-Langen
BBC, D-Mannheim

PRESENTATION

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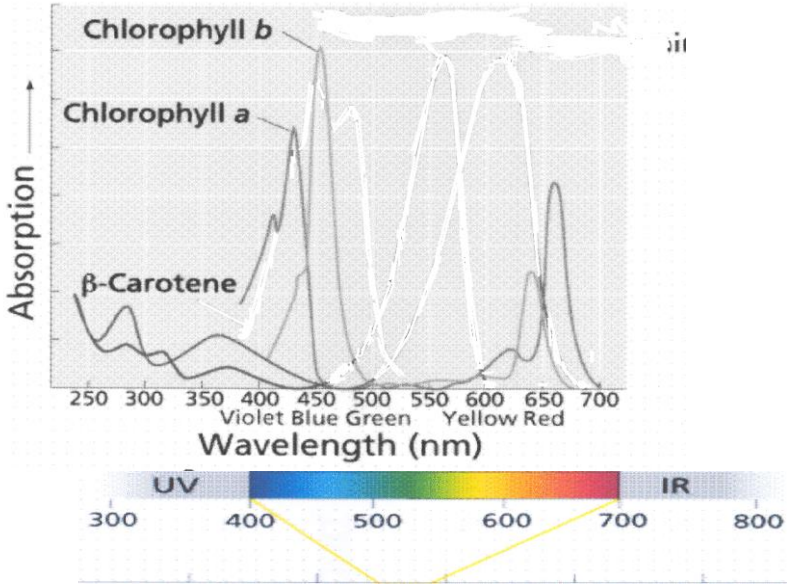
ABSTRACT

Disclosed is a *combination of interconnected innovative technologies* that point the way to sustainable solutions of the present environmental pollution and global warming problems comprising large scale *cyclic processes* with emphasis on *industrialized photosynthesis* with carbon *capture* and associated innovative fluid purification systems with total recycling and solids' recovery in closed systems.

basis of autonomic industrial photosynthesis



Consequences of the realisation of the technology disclosed here are the revamping of present global industries to achieve:

1. **Non-polluting *closed* recycling "*carbon dominating"* production systems**
2. **Expansion of recycling production spectrum to include "across the board" industrial *and* domestic energy and drinking quality water**
3. **Global "across-the-board" switch to recyclable *"carbon-based"* industrial and domestic products**
4. **Globally photosynthesised „*hydrogen & oxygen*" fuel**

GLOBAL ENVIRONMENTAL REMEDIAL PLAN WITH COMPREHENSIVE RECYCLING AND REUSE OF ALL MAJOR GLOBALLY USED NATURAL RESOURCES

New Patent Specification

CLAIM 1

1. **Plan for the transformation of existing global industries and communities now largely dependent on fossil oil, gas, coal *to photo-synthesised production and consumption facilities* to gain an all-encompassing photosynthesising solution to contemporary looming ecological and environmental disasters on the face our planet, whereby the present ever-increasing emissions of greenhouse gases are coupled with the ever increasing pollution of the water-ways, atmosphere and seas that signifies a prescient occurrence of a lethal, non-reversible situation on our planet.**
   Countering this threat points to the urgent need for comprehensive innovative recycling of the elements *carbon, hydrogen, oxygen and essential nutrients* together with the introduction of innovative autonomic photosynthesising systems and processes that will provide all-pervasive solutions to the present rapidly worsening global environmental, social and political problems.

Description

We on earth are now faced with serious existential challenges. It must be clear to even casual observers that “state-of-the-art” technologies have failed to provide answers to present day global ***energy, environmental***, ***ecological*** and ***social*** problems.

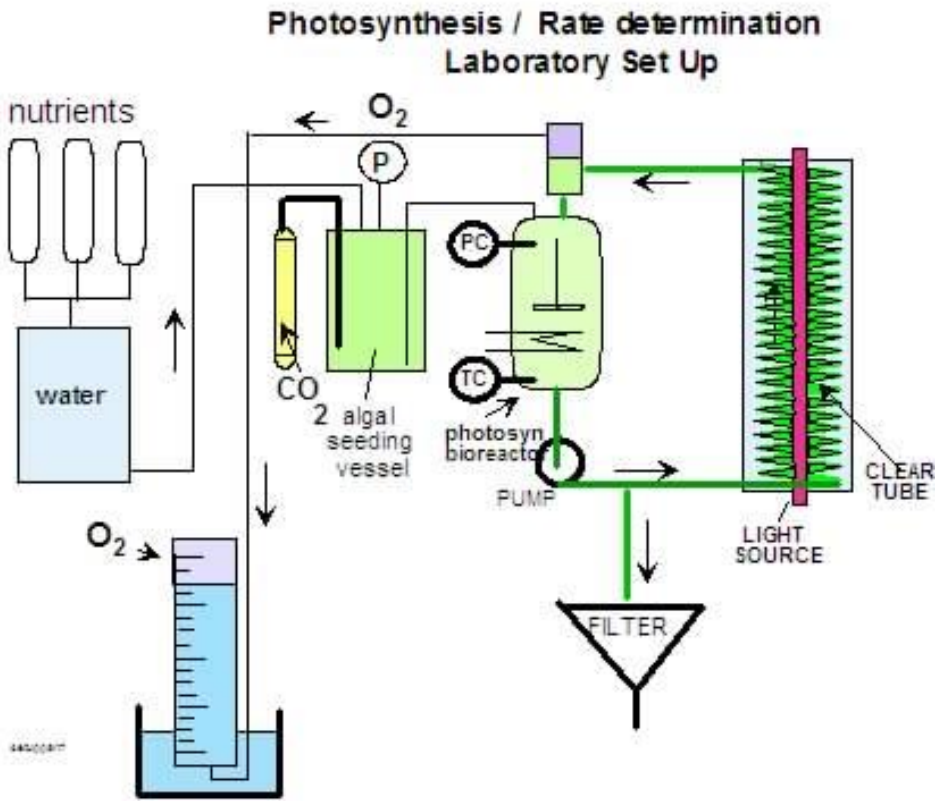
To achieve the required solutions nothing less than a “FURTHER INDUSTRIAL REVOLUTION” is required.

Unfortunately the word “carbon” is becoming increasingly demonised by global warming prophets. The following innovative specification describes how the present reputation of this perhaps most demonised element can not only be revived but also marvelled at!

Corrective measures will involve the revamping of existing large scale global polluting industrial entities with interconnected innovative technologies, whereby the key to this lies mainly in the projected availability of the following inventive technologies:

CHAPTERS

Chapter 1
Bench and pilot scale industrialized photo-synthesising investigations



OPERATION

Purified water dosed with nutrients is pumped to an *algal seeding vessel* saturated with carbon dioxide (CO2) from where the contents are transferred to the *photosyn bioreactor group* to be recycled through a photosynthesising apparatus consisting of a closed vessel containing wound transparent tubing *enclosing a vertical source of photosynthesising light*.

The photosynthesised seeded variety of hydrocarbon (e.g. algae) is continually recycled by a pump until the carbon dioxide (CO2) in solution is largely converted by photosynthesis to hydrocarbons. Simultaneously emitted oxygen (O2) or hydrogen (H2) accompanying the photosynthesis process is separately collected.

On approaching the depletion of the photosynthesising process the contents of the photosynthesising group are filtered forming a "cake" of hydrocarbons for further processing.

Chapter 2
The realization of advanced industrialized photosynthesis

The following detailed description describes the possibility for mankind to enable the earth to return to the natural processes it enjoyed over the billions of years before the advent of "homo-sapiens".

Comprehensive recycling of used global carbon and water

We on earth are faced with serious existential problems.
It must be clear to even casual observers that "state-of-the-art" technologies and the necessary collective willpower have failed to provide answers to present day *energy* and global *environmental*, *ecological* and *social* problems:

Putting aside the dangers of global warming, an even deadlier danger to humanity and nature is the continuing dumping of untreated waste matter of both industrial and domestic sources into the environment.
Today´s land and crust masses, rivers, streams, lakes and oceans are becoming increasingly polluted by indiscriminate dumping of polluted waste liquids and solid scrap materials into the environment.
Especially the almost complete disappearance of fish-life in land water ways is a testimony to this!
How can it come about that despite the fact that over previous centuries these dangers have been repeatedly proclaimed by experts and institutions as well as discussed and publicized at a host of international climatic and environmental conferences without any convincing outcome?

The way ahead:

According to this presentation the way ahead is to enable the application of nature's own invention of photosynthesis to solve present and future global energy and food problems combined with strict environmental demands, whereby entirely *novel apparatus and methods for generating and applying electromagnetic radiation* are described.
Industrialized photosynthesis holds the key to solving present day global existential problems involving negative climate change, ecological and environmental damaging industries and means of energy generation.
The key to achieving these goals lies in the further development of perhaps natures´ greatest achievement:

The discovery of
PHOTOSYNTHESIS

CARBON DIOXIDE + WATER + SUN > CARBOHYDRATES (LIFE)

It is significant that in the minds of most of contemporary homo-sapiens carbon dioxide is the most bedevilled substance on earth!
It is also highly significant that to date little engineering and technical advances associated with nature's own discovery have been forthcoming to solve the present day existential threats listed above.

The following listed innovations involve photosynthesis with the comprehensive recycling and reuse of carbon, hydrogen, oxygen **(carbohydrates) and other essential elements listed in the table of elements that could usher in a NEW AGE of CARBON and WATER with a solution to many of the looming global disasters.**

State of the Art Industrialized photosynthesis holds a key to solving the global existential problems involving **negative climate change, ecological damaging industries and energy generation**. However, the science of industrialized photosynthesis as a unit process and operation is still largely restricted to laboratory scale activity.

To achieve the quantities of photosynthesised carbohydrate material required for global energy generation far more productive and space saving methods are required than that of conventional solar dependent agriculture.

Some typical existing photosynthesising processes are categorised here under the following headings:

a) Open ponds and raceways
b) Closed raceways
c) Tubular gas bubbling and lifting types
d) Hollow vertical glass-plate types

The main aim of the embodiments and application of these known contemporary systems is using the products of photosynthesis for the rectification and remedial treatment of polluted waste streams of both effluent gases and liquids, whereby a further aim is to use the resulting harvest of photosynthesised biomass to create alternative sources of fuel to replace fossil fuel sources. The photosynthesis takes place mainly in so-called photosynthesising outdoor raceways and pools in which phototropic biological species such as algae are cultivated.

Typical Systems

Earlier, CO_2 (carbon dioxide) was not considered to be a serious threat to the environment. The most common types of large scale industrial photo-bio-generation equipment were designed as open shallow ponds with water levels ca. 15-30 cm high each covering an area of 1000 – 5000m^2 constructed as systems of loops in which the culture is circulated by paddle wheels (Richmond, 1986).

It is reported that such designs have the advantage of being simple to construct and maintain. However difficulties have developed in the sustainability and lack of space for the realisation of such processes. It is also recorded (Richmond, 1992 and Tredici et al. 1991) that many of such systems failed due to low productivity caused by culture contamination by damaging airborne micro-*organisms* with the open unprotected design.

Innovative algal and herbal genome manipulation

Fig.1a represents the structure of a typical plant genome molecule "**chlorophyll"** with molecular weight of close to 500 with over 50 carbon atoms and a central magnesium atom. It is conceivable that herbal and algal matter consisting largely of these or similar pigmented carbohydrates could be genetically manipulated to produce plant and sea life specially mutated for future large scale photosynthesising projects.

The scope is to alter the genome structures of algal and plant organisms to significantly increase the content of chlorophyll (light sensitive pigmented molecules) in plant life.
Typical published chlorophyll content in algal matter is reported to be of the order of only 0.4% w/w of “wet” matter. Achieving 4% w/w could result in a 10-fold increase in growth rate with an identical degree and type of light radiation while achieving 90% w/w would result in an approximate 200-fold growth rate. Theoretically a large increase of chlorophyll content in algal and plant matter for energy generation could achieve growth rates under normal nutrient conditions of 1kg/ m^2 /h.

In fact such increased growth rates could be achieved by treating the chlorophyll genome as another carbohydrate and envisage the development of algal and plant life largely consisting of conglomerations of these large organic molecules. At least a moderate development in this direction with respect to algal-life would ensure the successful development of the present proposed overall technology disclosed here.

The overall aim is by means of laboratory and pilot-scale experimentation to establish and optimise all the pertinent photosynthesising parameters involved in the processes of energy generation with total carbon recycling as defined here to achieve near zero carbon emissions and zero environmental pollution, thus enabling the design and fabrication of prototype pilot plants leading to full scale industrial energy generation and production units for global installation.

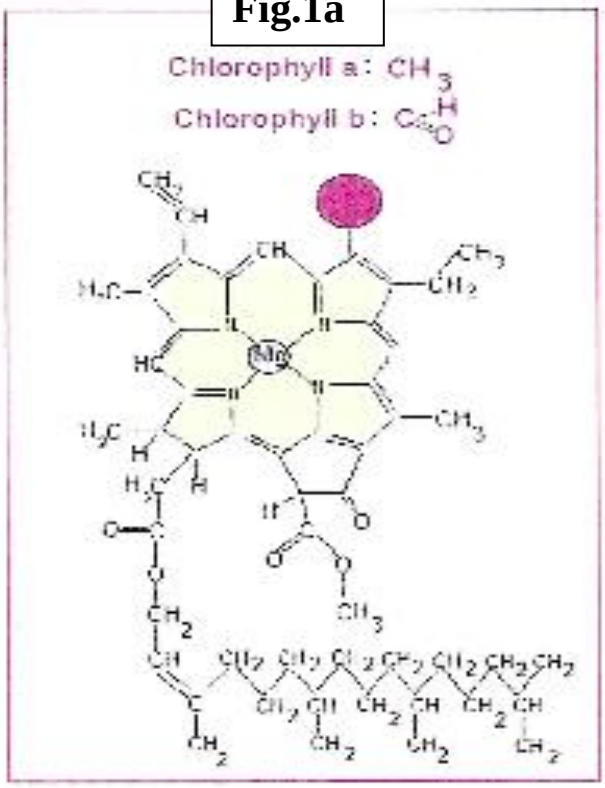
This will mean the possibility of a complete switch from large *fossil fuel* and *petrochemical* complexes to more compact and productive non-polluting global *photosynthesising* industrial sites.
Since abandoning the tree-tops mankind has increasingly exploited nature´s greatest invention – photosynthesis - as the main source of the means of survival and dominance over the environment.
The goal of the technology described here is to continue this exploitation but without the risk of destroying the positive aspects of what nature and mankind have already achieved.

Fig 1.a illustrates the molecular structure of the genomes of chlorophyll “a” and “b” that convert carbon dioxide and water to hydrocarbons .
With a molecular weight of close to 500 with over 50 carbon atoms and a central magnesium atom it is conceivable that herbal matter consisting largely of this or similar pigmented carbohydrates could be genetically manipulated to produce plant life specially mutated for future photosynthesising projects

Claim 2

Autonomic photo-synthesising sites according to Claim 1, whereby LASER and/or LED (light emitting devices) are employed to generate beams of light with specific wave-lengths illustrated in Fig.1b suitable for interaction with gene-molecules such as chlorophyll (a),& (b) Fig.1a, for the concentrated generation of carbohydrates (sugars) illustrated in Fig.1c ("Calvin-Benson cycle").

Fig.1a



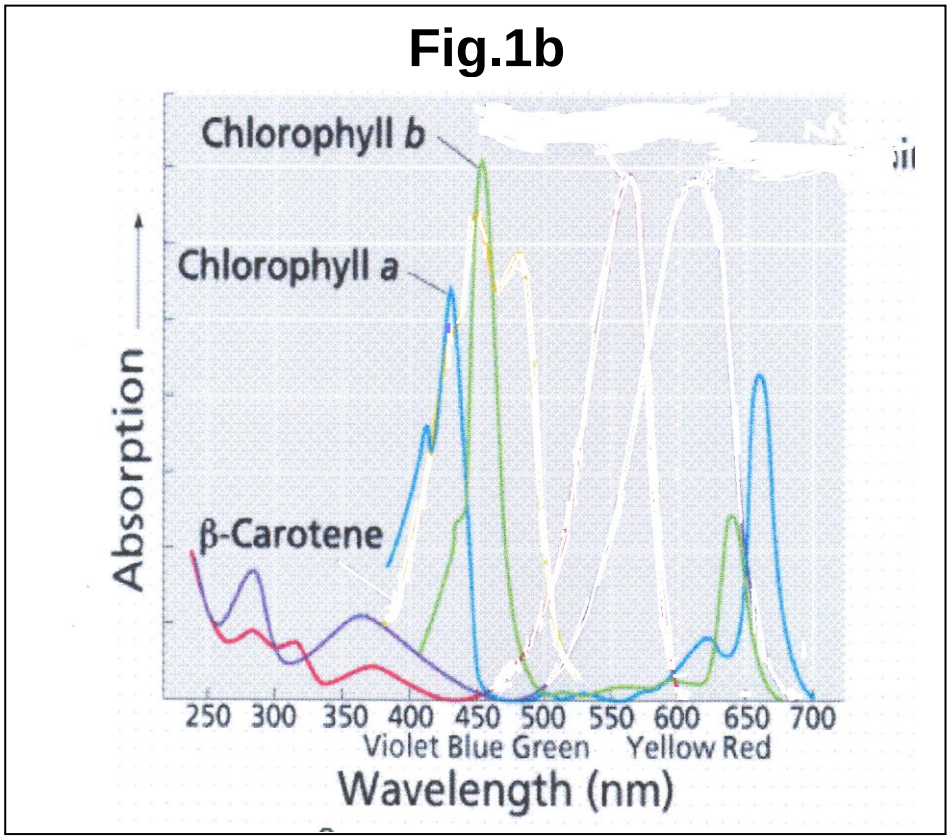
The scope is to alter the genome structure of plant organisms to significantly increase the content of chlorophyll light sensitive pigmented molecules. A typically published chlorophyll content in algal matter is reported to be of the order of only 0.4% w/w of "wet" matter.

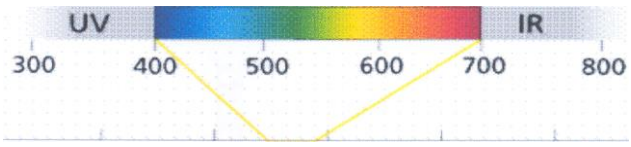
Achieving 4% w/w would result in a 10-fold increase in growth rate with an identical degree and type of light radiation.
Achieving 90% w/w would result in an approximate 200-fold growth rate.
Theoretically a large increase of chlorophyll content in algal and plant matter for energy generation could achieve growth rates under normal nutrient conditions of 1kg/ m^2 /h. In fact such carbohydrates largely consisting of conglomerations of these large molecules with increased growth rates could be achieved by treating the genome as just another carbohydrate and envisage the development of plant life largely consisting of conglomerations of these large molecules.
Fig 1b illustrates how the spectrum of the light rays of the sun needed for the photosynthesis of Chlorophyll "a" and "b" peak at approx. 430 and 450 nm.

Claim 3

Processes according to claims 1, 2 whereby by means of genome manipulation (GM) the density of genome-molecules such as chlorophyll (a) & (b) are maximised to optimally respond to specific narrow pulsed beams of electromagnetic radiation illustrated in Figs.1a/b.

Fig.1b





All past attempts to cultivate carbohydrates as fuel for large scale power generation to replace fossil fuels have been unfruitful, whereby the problem and solution are as follows:

To enable the application of nature´s own invention entirely novel apparatus and methods for generating and applying electromagnetic radiation* and *purification and recycling of both gaseous and liquid materials in the processes are required.

This can be explained by the fact that 10-30 billion tons/annum of agricultural produce would be required to satisfy the present global fuel requirements.

This is a multiple of the present food requirements of both human and animal consumers on our planet.
The advantages of the technology described in this disclosure compared with existing agricultural photosynthesising processes lies in the potential for significant contained space-saving, highly productive systems for the realisation of the large quantities of ***non-carbonaceous fuels*** for globalized domestic energy consumption.
The aim is by means of laboratory and pilot-scale experimentation to establish and optimise all the pertinent photosynthesising parameters involved in the processes of energy generation ***with total carbon recycling as defined here to achieve zero carbon emissions and environmental pollution,*** thus enabling the design and fabrication of prototype plants leading to full scale industrial energy generation and production units for global installation**.**

Of equal importance is the realisation of means to irradiate plant life with narrow bands of light wavelengths as illustrated in Fig.1b.

Pulsed radiation of both "**LASER" and "LED**" (**L**ight **E**mitting **D**evices) beams are potential sources of such radiation for application in systems portrayed in this specification.
The possibility of connecting photosynthesising sites with networks of glass fibre bundles analogous to the transmittance of digital data and electrical energy through bundles of copper wire should also be considered at an early stage.
Little if any serious research has been carried out concerning the further development of the application of these fundamental mechanisms relating to photosynthesis. The technologies of genome manipulation and the generation of pulsed light rays have certainly reached a sufficient degree of maturity to achieve such a goal.
A multi-disciplinary R&D approach is necessary and justified.

Other pigments such as Carotenoids have photosynthesising properties but the main interest of the present project is focussed on Chlorophyll "a" and Chlorophyll "b" that trigger chemical reactions when embedded in membranous matter such as chloroplast in plant and algal life or in photosynthetic prokaryotes such as cyanobacteria and prochlorobacteria. Chlorophyll a & b are electro-magnetically activated at wavelengths of ca. 425 & 450 nm.

Fig.1c illustrates photosynthesis as a two stage process in what can be described as a set of two electrically driven ***cyclic reactions,*** whereby fibreglass optics and laser technology provide the feasibility of applying narrow bands of electromagnetic wavelengths from within 400-500 nm (violet – blue) to specifically activate Chlorophyll "a" and/or Chlorophyll "b" sealed within the photo-bioreactor surrounded by mirror-like reflecting material to achieve +95% energy conversion efficiency of the photosynthesising process.

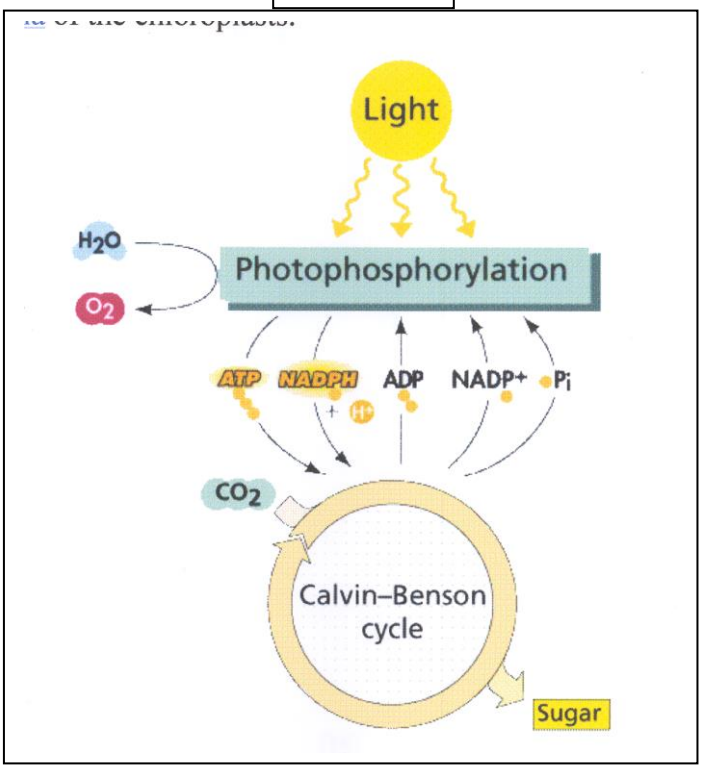
A positive result would mean the availability of unlimited quantities of energy and potable water anywhere on the surface of the globe largely independent of solar energy.

The development of this possibility would mean the ultimate realisation of the captive carbon principle.

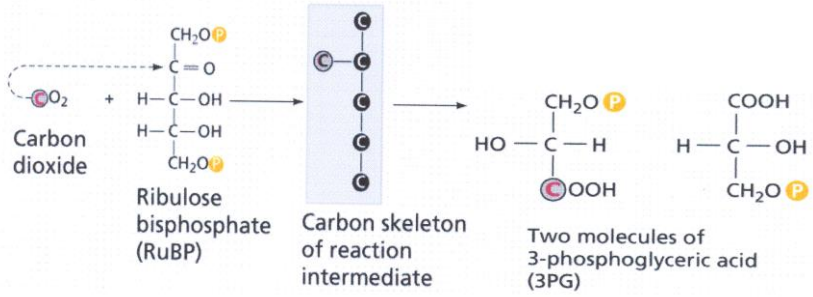
FIRST STAGE ("light reaction")

In the first stage light impinging on chlorophyll molecules thereby excite electrons to a higher energy level, whereby water molecules in the membranous matter are split into atomic oxygen that is set free as molecular oxygen and atomic hydrogen (protons) that are transferred by energy transporting molecules containing phosphorus (ATP and NADPH).

Fig.1c



SECOND STAGE ("dark reaction")



This in part explains why practically all past attempts to cultivate carbohydrates as fuel for large scale power generation to replace fossil fuels

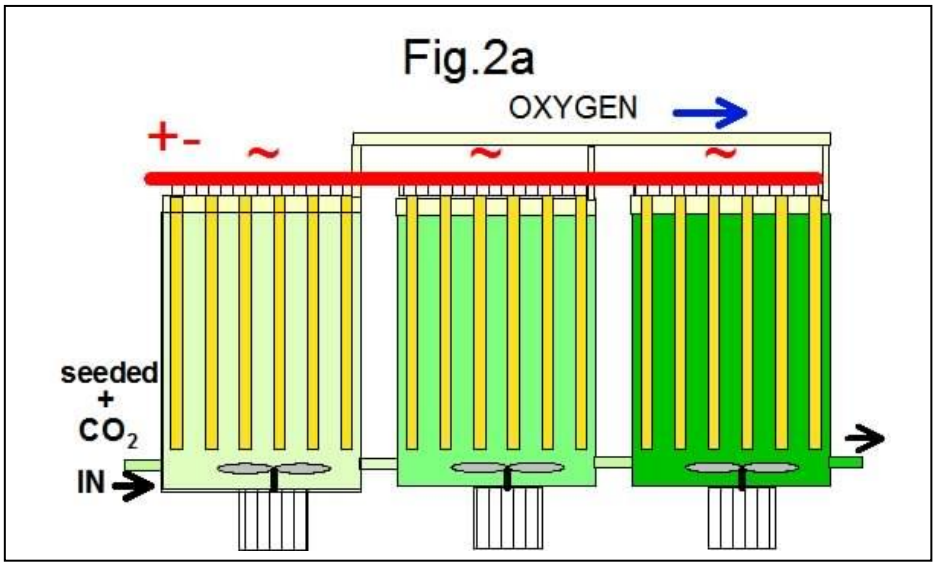
have been unfruitful, whereby the problem and solution are as follows:
A limited quantity of the total solar energy impinging on the earth surface is utilizable for the growth of hydrocarbons and alone the total quantity of hydrocarbons needed to satisfy present demand for the generation of global energy would require much more agricultural land than presently available on the face of the planet.

Claim 4

Systems according to Claim1 consisting of photo-synthesising sites containing units of photosynthesising bioreactor vessels containing submerged light emitting devices suitable for closely approaching autonomic photosynthesising operations illustrated in Figs.2a/b.

In the second stage where in what is known as the Calvin-Benson Cycle hydrocarbons (e.g. glucose) are synthesised from carbon dioxide and protons (atomic hydrogen).

Fig 2a illustrates apparatus that enable 10-100 times the productivity of carbohydrates compared with state-of-the-art equipment and systems and natures solar possibility.



Algal seeded and carbonized water is pumped through reactor-like vessels containing candle- or plate-shaped electrodes that radiate specific electro-magnetic light rays converting by means of photosynthesis the seeded algal matter into dense suspensions of algae.

- **Steps to realisation:** Appropriate bench-scale testing with the realisation and demonstration of the innovative technologies especially chlorophyll genome modification
- Pilot-scale realisations
- Full-scale realisation with integration of existing communities.

Claim 5

Light-emitting submerged elements according to Claim 2, whereby light emitting devices as illustrated in Fig. 2a consist of submerged candles or plates driving the photosynthesising process powered by constant e-transmission from recycled power generated mainly by the combustion of chemical elements and compounds originating from the largely autonomic photosynthesising

Employing fibreglass optics and laser technology the feasibility of applying narrow bands of electromagnetic wavelengths from within 400-500 nm (violet – blue) to specifically activate Chlorophyll "a" and/or Chlorophyll "b" sealed within the photo-bioreactor surrounded by mirror-like reflecting material to achieve +95% energy conversion efficiency of the photosynthesising process should be established.
A positive result would mean the availability of potable water anywhere on the surface of the globe independent of fossil carbon and solar energy.
The development of this possibility would mean the ultimate realisation of the captive carbon principle for global energy generation.
Of equal importance is the realization of means to irradiate plant life with narrow bands of light wavelengths as illustrated in figs.2a, 2b, 2c.
Pulsed radiation of both "LASER" and "LED" beams are potential sources of such radiation for application in systems portrayed in this specification.
The possibility of connecting photosynthesising sites with laser-networks or with glass fibre bundles analogous to the optical transmittance of digital data should also be considered.

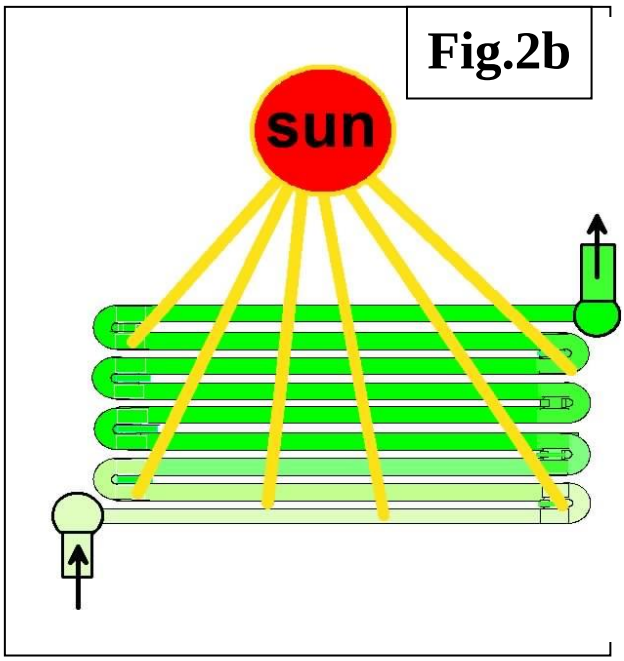
Claim 6

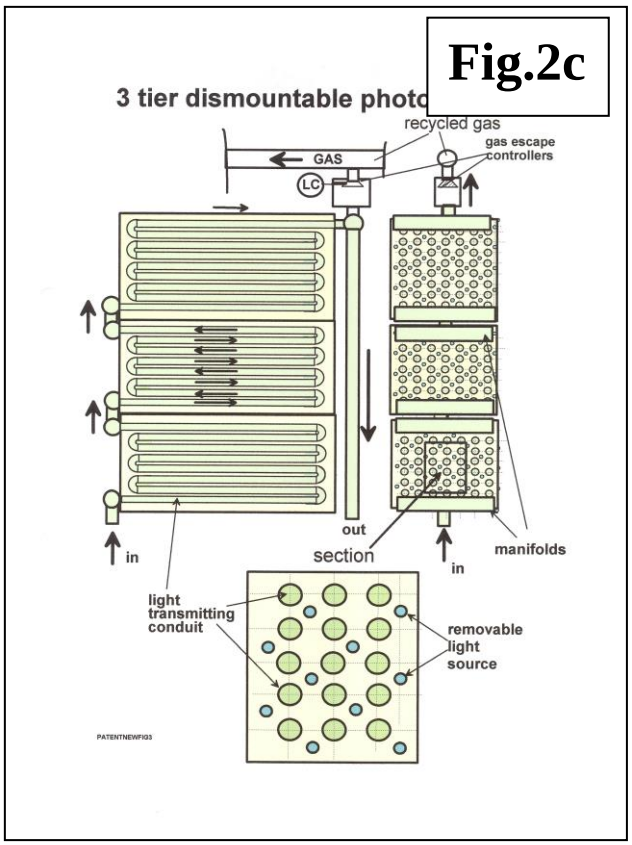
Processes and apparatus according to claim 1 and Fig.9a stages 1, 5 containing photo-bioreactors and photo-biomass/agricultural growth units, whereby the chlorophyll contents of the generated carbohydrates are enhanced by genome-manipulation (GM) according to Figs.1a/b/c.

In **Fig.2b** algal seeded and carbonized water is pumped through translucent serpentine pipe-work exposed to the rays of the sun to achieve the same or similar result.

In **Fig.2c** in addition to solar rays provision can be made for the insertion of light emitting elements preferably LASER and LED optics with the preferred emitted wavelength range of 400-700 nanometer between the individual fluid conducting conduits.

Positive pressure is maintained in both the liquid and gaseous phases of the system during operation. The gases emitted and collected in the individual photo-batteries in upper contained spaces fitted with liquid level controllers allowing evolved gas from the batteries composed of oxygen and hydrogen and some residual carbon dioxide to be intermittently vented to the gas main from where they are pumped to storage or direct to the combustion chamber of power generators.

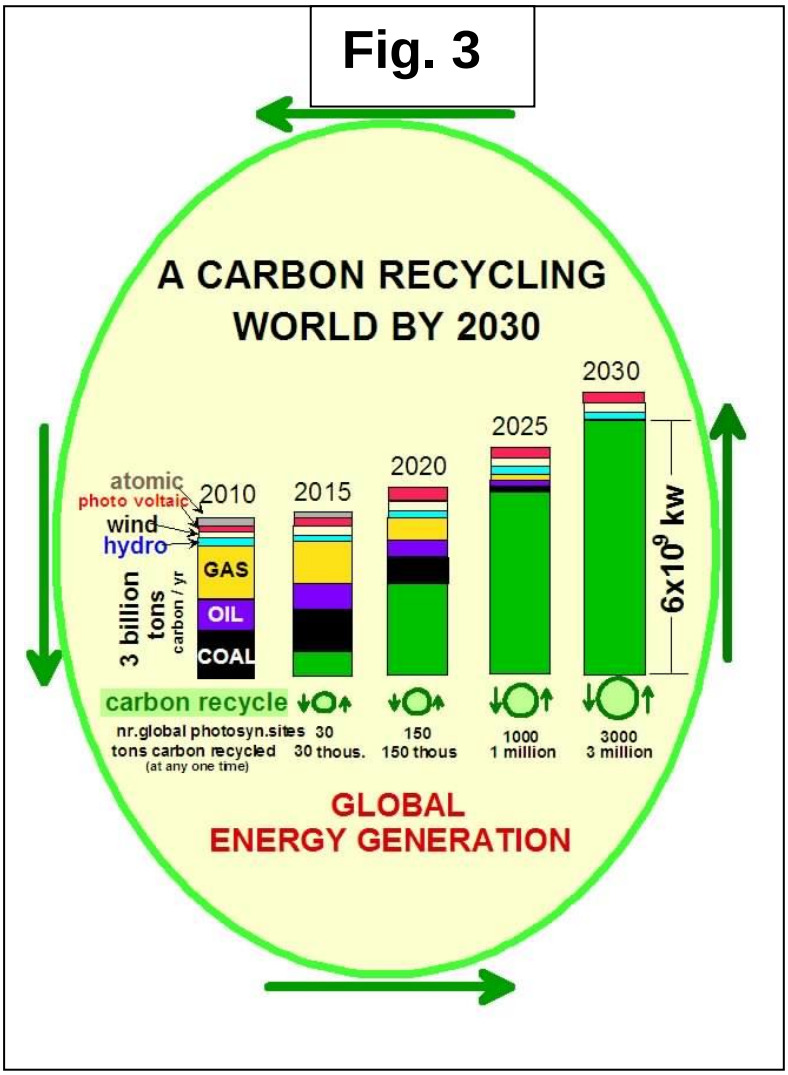




Little if any serious research has been carried out concerning the further development of the application of these fundamental mechanisms relating to photosynthesis.
The technologies of genome manipulation and generation of pulsed light rays have certainly reached a sufficient degree of maturity to achieve such a goal.
A multi-disciplinary research approach is necessary and justified.

Claim 7

Comprehensive global carbon recycling plan as depicted in Fig.3 where ca. 8 million tons of carbon dioxide distributed in ca.3-5000 worldwide photosynthesis installations to be continually recycled while generating ca. 6 billion KW of electric energy, close to the entire generating requirement of a world-wide population, whereby the ca. 3 billion tons/year of fossil coal, gas now being extracted from earth´s crust and largely discharged as polluting carbon dioxide into the atmosphere will remain indefinitely in the earth´s crust.



By 2030 the fossil fuel still in the earth´s crust should remain there and according to the present invention replaced by comprehensive permanently recycling of set amounts of the strategic element CARBON and the compound WATER used or produced in energy generation and the production of all recyclable carbon-based products.

We on earth are now faced with serious existential problems. It must be clear even to casual observers that state of the art technologies have failed to **provide answers to the need for clean global *energy*, *pure water supply* and the associated *ecological* and *environmental* problems.**
At the present rate of the plunder of the earth´s crust with the rapid decline in the availability of fossil carbon and a long list of essential elements in the earth´s crust coupled with a worsening negative climate change and to the ever increasing discharge of polluted gases and heat

into the atmosphere are endangering the very existence of a large proportion of the present animal and plant life on our planet as well as from the present rapidly rising sea levels due to the melting of the polar and mountainous ice deposits and the continuing pollution of the world water reserves both above and below ground level.

How can it come about that despite the fact that over previous centuries up to the present day these dangers have been repeatedly proclaimed by experts and institutions as well as discussed and publicized at a host of international climate-change conferences without any convincing outcome? Significant engineering and technical advances associated with nature's own discovery of photosynthesis are urgently needed to solve the present day existential threats listed above.

The following described innovative technologies involve photosynthesis and the comprehensive recycling of carbon, water and other essential elements listed in the table of elements that can usher in a NEW AGE of CARBON and WATER AVAILABILITY with solutions to many of other looming environmental disasters.

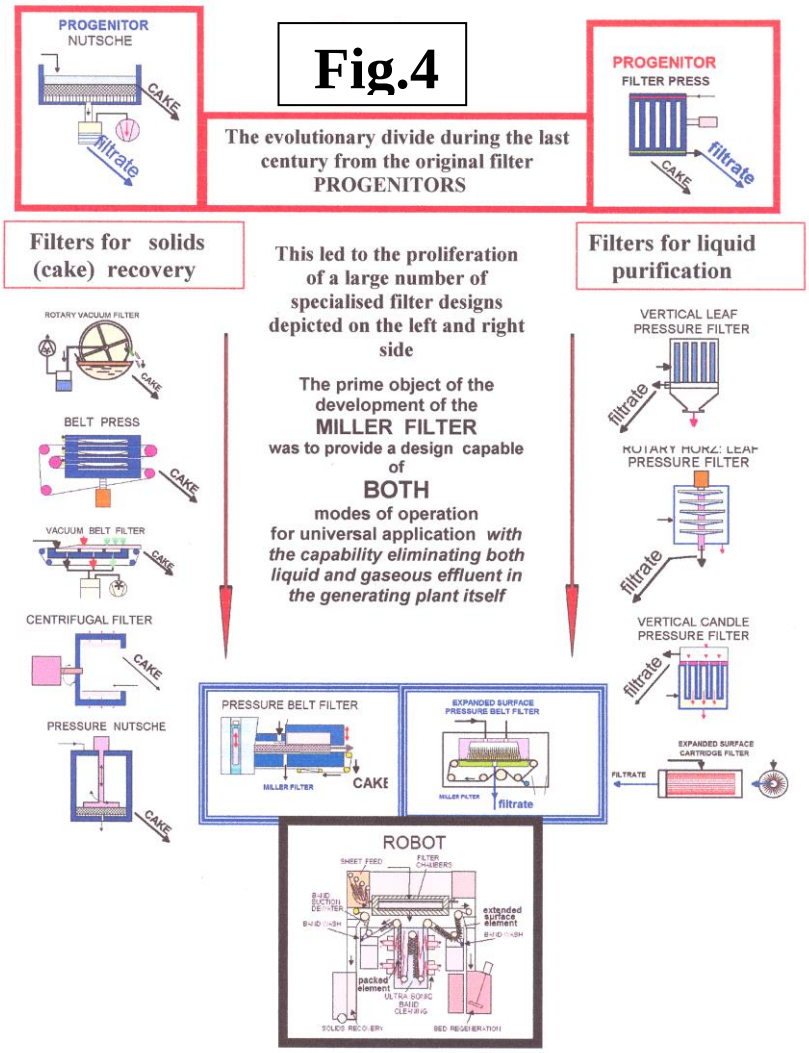
Provision can be made for the insertion of light emitting elements preferably fiber optics with a preferred emitted wave length range of 400-700 nm (nanometer) between the individual fluid conducting conduits of Fig.2c. Positive pressure is maintained in both the liquid and gaseous phases of the system during operation. The gases emitted and collected in the individual photo-batteries collect in upper contained spaces fitted with liquid level controllers allowing evolved gas from the batteries composed of oxygen and some residual carbon dioxide to be intermittently vented to the gas main from where it is pumped to storage or direct to the combustion chamber of power generators.

Chapter 3

Innovative industrial recycling technology

Although innovative fluid purification systems to enable the long-term recycling and reuse of all fluid streams generated and used within industrial and human habitats have recently become available there is still no general industry-wide trend to install them in an effective way to solve the present persistent environmental pollution.

Firstly it should be explained *why* ***state of the art*** fluid purification technology is not up to the task of maintaining large-scale biological processes such as photosynthesis of carbohydrates in the required degree of sanitation and sterility to maintain sustainable yield of product in the long-term.



The right hand column of **Fig.4** illustrates a representative selection of state of the art filtration equipment used in world-wide processed liquid purification, e.g. beverages, food, water, chemicals, etc. These are all multi-surface packets of varying design and types of media contained in pressure vessels many of which have been used for more than a century. It must be kept in mind however that such equipment can achieve a high degree of purity and sterility.
The daunting problem with all however is the regeneration and long-term reuse of the filter media.
These attempts are always accompanied by large volumes of polluted regenerating liquids that are inevitably drained to some form of "effluent treatment" plant or direct to sewage or nearby water ways.

Generally the rules of the game (mostly regulated and supervised by governmental "environmental agencies") stipulate that the effluent discharger **is bound to employ the " *best state of the art* " equipment or process available to purify the effluent before discharge**.
These best available equipment or processes in most cases happen to be the very filters that have caused much the global effluent problem in the first place!

BACKGROUND

All previous attempts at large-scale production of biomass from photosynthesised algae and bacteria have failed largely due to the inability to maintain the required degree of sterility in the ponds, lakes, pools, raceways, bioreactors, etc. to prevent the biological degradation of the matter to be harvested and the surrounding nutrient. It has been clearly demonstrated that large-scale facilities such as lakes, ponds, raceways, etc. exposed to the ambient atmosphere will not provide the answer to the search for sustainable methods of industrial scale photosynthesis.

Claim 8

Comprehensive recycling facilities according to Claim1, whereby fluid purification, recycling and recovery steps of independent industrialised settlements are achieved by fluid purification processes and apparatus consisting of contained transportable filter-bands illustrated in Figs.4-6 whereby the filter-bands are designed to move intermittently over plane pervious support members that are engaged peripherally by moveable lids to seal overlying sections of the stationary filter band to form a space or spaces into which fluid is delivered and allowed to exit through the sealed section or sections of filter-band by means of pressure differential, whereby a section or sections of the filter-band with solids deposited on such sections can be transferred to extra planar support members enabling further distinctive operational procedures to be carried out.

The problem is per-se not one of purification, as membrane technology (at a cost) can *theoretically* provide solutions for any conceivable purification demand. **The core problem lies with *media regeneration*.** Membranous filters are notorious for becoming unusable after a short period of operation despite the application of the best known regeneration techniques. Only in exceptional circumstances can filters illustrated on the right hand side of **Fig.4** under ***"Filters for liquid purification"*** be regenerated and reused. Filter media such as membranous material are needed to remove particulate matter in the nano-micro particle size range. Unless such filter media can be regenerated and reused over a lengthy period of operation the economics of the operation becomes untenable

This led to the ***evolutionary division*** of the further development into two distinct branches**:**

The progenitor of all filtration apparatus the **"**NUTSCHE" filter (Fig.4) with a single horizontal filter surface was largely replaced during the 20th century by the development of the vertical multi-planar FILTER PRESS for universal

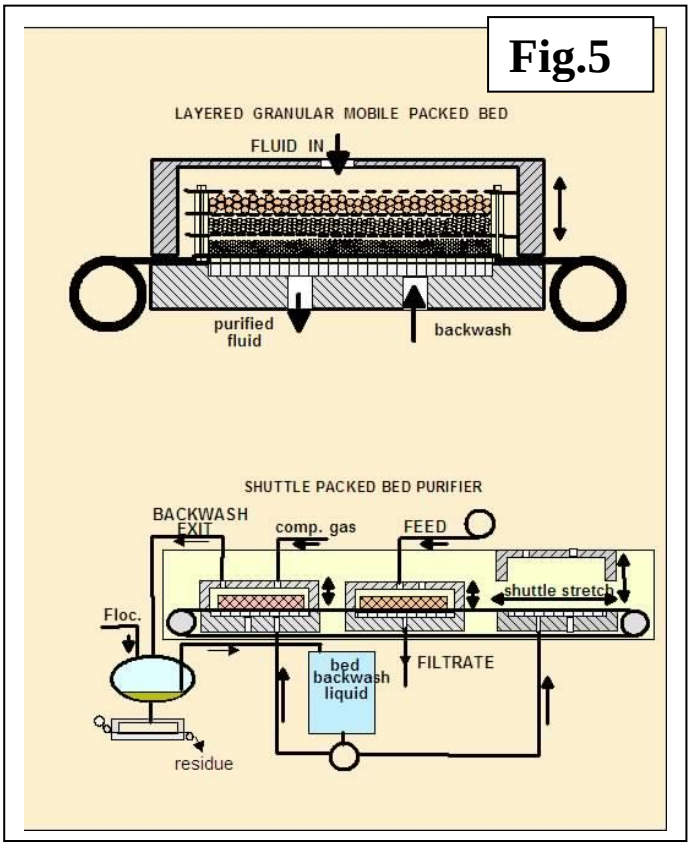
- fi**lters for fluid purification**
  and
- **filters for solids recovery.**

Filters for fluid purification

In the further evolution of the FILTER PRESS during the 20th century the *exposed* multi-planar elements were simply encased in *pressure* vessels resulting in an enormous proliferation of varying designs based on this configuration and an ever increasing pollution of the environment due to large volumes of liquid used in attempts at freeing blocked media after the filtration operation proper. Large quantities of varieties of filter aid powders used to solve the media blocking problems became a further part of the problem when flushed down the drains saturated with products containing an enormous range of polluting matter.
More than any other causal effect it is the continued reliance on these and similar types of apparatus to solve the global fluid purification problems that is causing much of the present state of global environmental pollution and explains why such an obvious solution to the climate change problem as the growth and harvesting of algal biomass has not yet been realised on a large scale.

THE SOLUTION:

:A *single complete processing and purification system for fluids (liquids and gases) whereby a universally applicable fluid purification and separation system plays the central role in fluid processing for the realisation of advanced human habitats.* The solution involves the provision of processes for the regeneration and reuse of powdered and granular filter media including high pressure jets of washing fluids, backwashing, chemical cleaning procedures, vibration and ultrasonics.



Bed regeneration

Simultaneously the exhausted bed (left) **Fig.5** is subjected to backwashing with recycled purified liquid . Further combinations of regenerative measures (not shown) such as bed treatment with ultrasonic vibration and facilities for washing the beds with acids, alkalis, solvents and bed drying with heated gas or vapour are also available for application

By means of the present disclosed “shuttle” concept, the filter packs after the filtration/purification operation are moved to specially designed regeneration zones while simultaneously a freshly regenerated pack is positioned by the common belt in the “purification zone” to continue the operation.

Fig.6 is a schematic representation of a large-scale universally applicable fluid purification system according to the present invention,

Unit 1: SHUTTLE PACKED BED PRESSURE BELT FILTER
Packed beds containing granular activated carbon, silica gel, “Bentonite”, etc. used for adsorptive fluid purification followed by bed regeneration.

Unit 2: SHUTTLE EXPANDED SURFACE PRESSURE BELT FILTER

Unit 3: COUNTER-CURRENT BED REGENERATION SYSTEM

Unit 4: SOLIDS RECOVERY AND LIQUID RECYCLING SYSTEMS

conceived to solve the above described problems

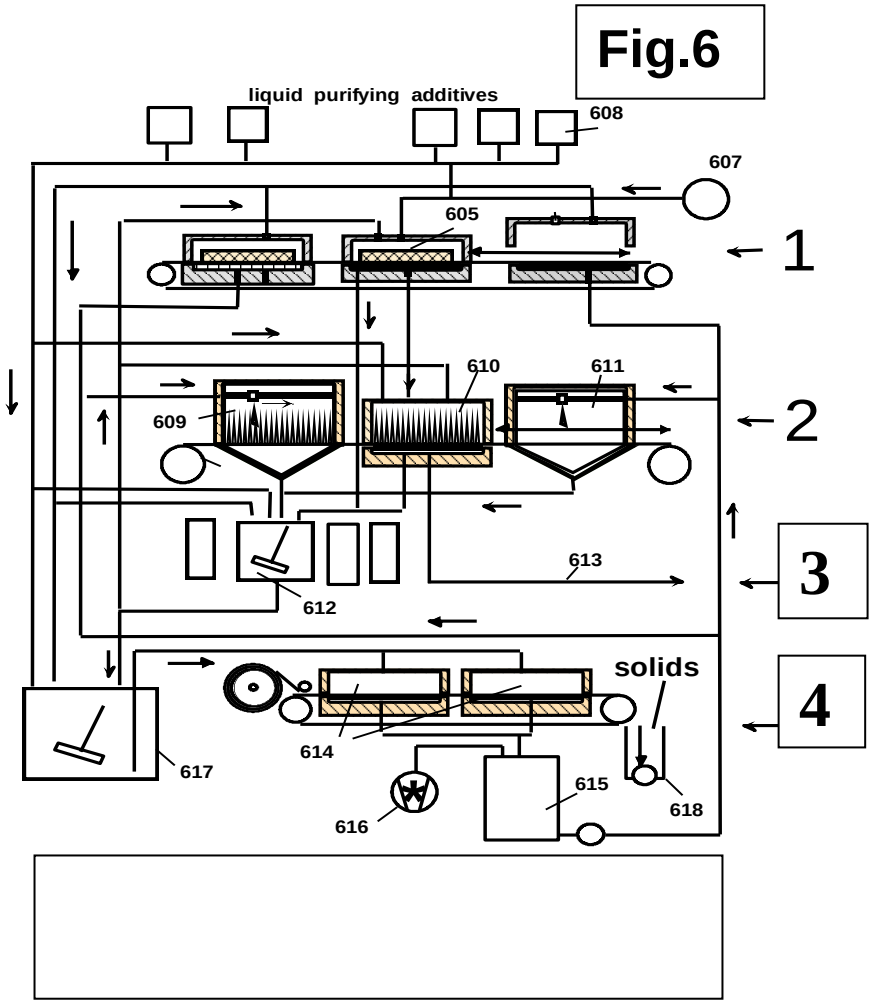
Further details of background design and operation are disclosed in patent specifications GB2280857, GB2331027, GB2323852, GB2324975

UNIT 1 shuttle deep bed purification

UNIT 2 shuttle extended filter surface area

UNIT 3 filter aid regeneration

UNIT 4 solids / liquid recovery & recycling



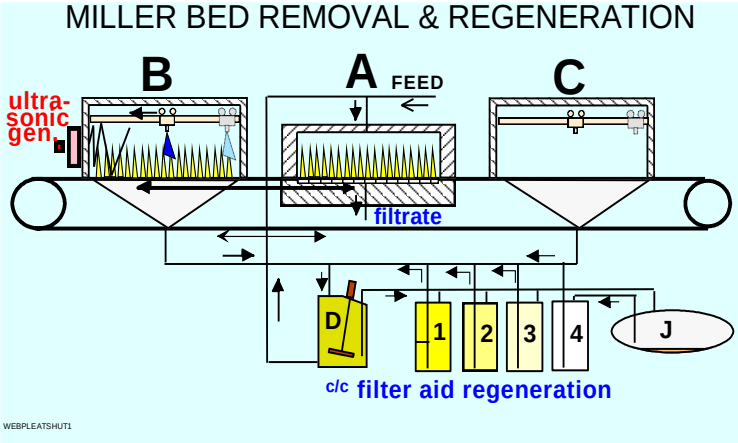
Unit 1 Operation/: The central purification chamber **605, Fig.6** (unit 1) and **Fig.5** is reserved for fluid purification and contains a regenerated packed bed from the previous cycle transferred on the belt from the bed regeneration chamber (right).
Chamber **(left)** now contains the exhausted packed bed for regeneration previously in **605.**
Liquid for purification dosed with flocculating or coagulating material from **608** or gas pre-radiated with corona discharge or its equivalent to electro-statically charge suspended particulate and aerosol matter is pumped by **607** through the bed in 605 in an *oppositely charged state* and if necessary can be delivered as purified or partially purified fluid to **610** in **Unit 2** for *more intensive final purification* The used backwash or cleaning liquid is collected in **617** dosed with purifying agents from **608** for purification/filtration in **614** and collected as filtrate in **615**. After purification and bed regeneration in **Unit 1** the zones are opened and the band, moving in the *opposite* direction (shuttle-mode), ***delivers*** the exhausted bed in **605** to the empty right hand chamber and the regenerated bed on the left to **605** for the following cycle.
Unit 1 with packed bed members can also act as support for layers of pre-coated filter-aid whereby separation of particulate matter in the size range 0.001-0.1 micron for certain operations is achievable.

Unit 2 is a shuttle unit consisting of a twin regenerative mobile sets of extended surface filter elements fitted with membranous or woven media for the separation of particulate matter in the ***nano-micro size range*** often acting as support for powdered or granular layers of pre-coated material such as **kieselguhr, silica**, **"perlite", glass or cellulose fibres, etc**. with a *mean* particulate size range of 30 micron often with the addition of finely ground purification material such as **activated carbon, ion-exchange resins, etc**.

Filter elements of **Unit 2** are fitted with membranous medium or pre-coated with layers of regenerated surface-charged powdered or granular material from 612, Unit 3 covering the surface of the membranous filter elements.
The purified fluid filtrate, now in a sterile condition, is delivered to its destination through conduit **613**.
Filter elements after filtration are regenerated by pressurized sluicing through movable nozzles **609** with recovered wash liquid from vessel **615 (unit 4)**
Simultaneously the previously exhausted shuttle element now in 609 is subjected to a variety of regeneration options including jets of high-pressure fluid, vibration, ultra-sonic generation, chemical treatment and backwashing.

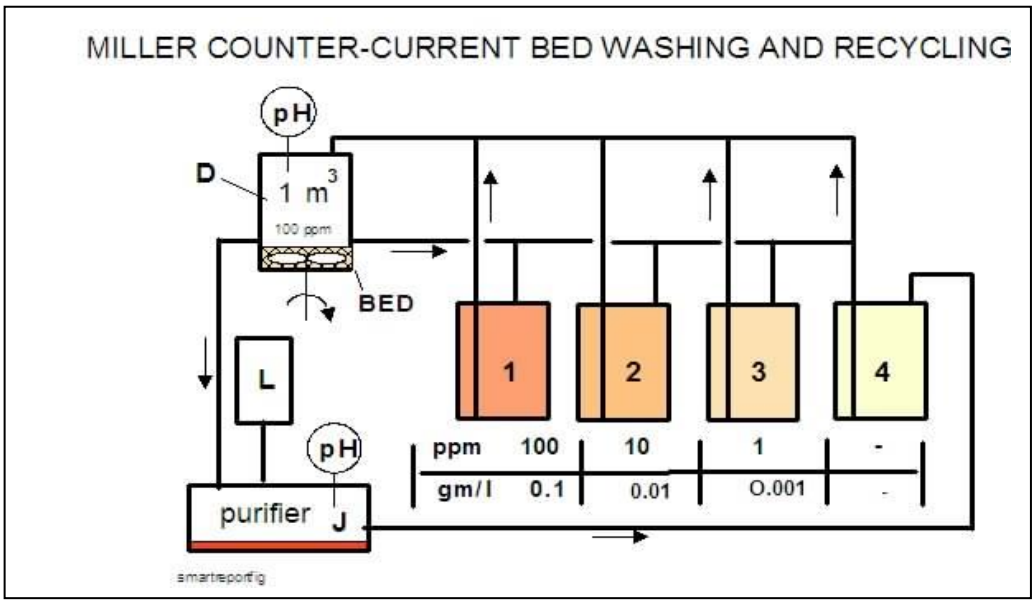
Unit 3 is the preferred innovative apparatus and method of the present invention for the **regeneration of pre-coated powder or granular purification media** from both **Units 1 and 2** described above.

Units 2/3



The removed used filter aid is collected in vessel **D** into which by means of counter-current *step-wise* operations the contents of vessels 1-4 are separately and consecutively transferred to stirred vessel D where consecutive slurrying/settling operations take place..

Unit 3



First, the contents of **vessel 1** are transferred to **D**, treated with purifying agent, stirred and allowed to settle, after which the supernatant is transferred to the **purifier vessel J**, dosed with purifying liquid and allowed to settle. The contents of holding **vessels 2,3,4** are consecutively transferred to **D** and

treated similarly except that the clarified (after settling) supernatant liquids are recycled to holding vessels **1,2,3** after which the final supernatant liquid in purifier vessel **J** is recycled to holding vessel **4.**
These counter-current stepwise operations can be carried out any number “n” times depending on the nature of the impurities in theconsists of a liquid residue purification apparatus

Unit 4, Fig.6, 614 consisting of a moveable filter band arranged to move intermittently between two or more separately located sealing elements and two or more plane, pervious support whereby, alternatively, the band can be fitted with paper band media of expendable non-woven filter material in roll form suitable for incineration.
The unit is fitted with a gas pump **616**, filtrate recycling apparatus **615**. Solids residue as well as product solids are recovered from suspension in this unit and collected in **618.**
Liquid suspensions from the regeneration of shuttle fluid purification members are purified and recycled to **Unit 1 & 2** for further member regeneration purposes thus achieving an essentially captive cyclic process.
These systems find general application in practically all fluid processing operations and are especially suited for mastering the production facilities of ***multi-product operations*** supplying human habitats with all their basic chemicals, pharmaceuticals, beverages, food, etc.

The era of universal, fully automatic, emissions-free production facilities to satisfy the entire requirements of whole populations on a global scale is dawning!

Chapter 4
Power thermodynamics

Fuel heating values

Hydrogen

Heat of combustion 60.000 BTU/lb / 290 kJoule/mol

$$2H_2 + O_2 = 2H_2O$$
4 36

Combust. Temp. ca. 1000 ^{0}C

Ethylene

Heat of combust. 22.000 BTU/lb /1560 kJoule/mol

$$C_2H_4 + 3O_2 + 9N_2 = 2CO_2 + 4H_2O + 9N_2$$
30 (AIR) 90 36 250

Combust. Temp. ca. 300 °C

The elevated combustion temperature of hydrogen + oxygen compared with ethylene + air results in a comparable overall energy output.

Claim 9

An industrial photosynthesising process for the production of the most economical and environmental protective combination of oxygen and hydrogen gases for electric and combustion energy generation and water production.

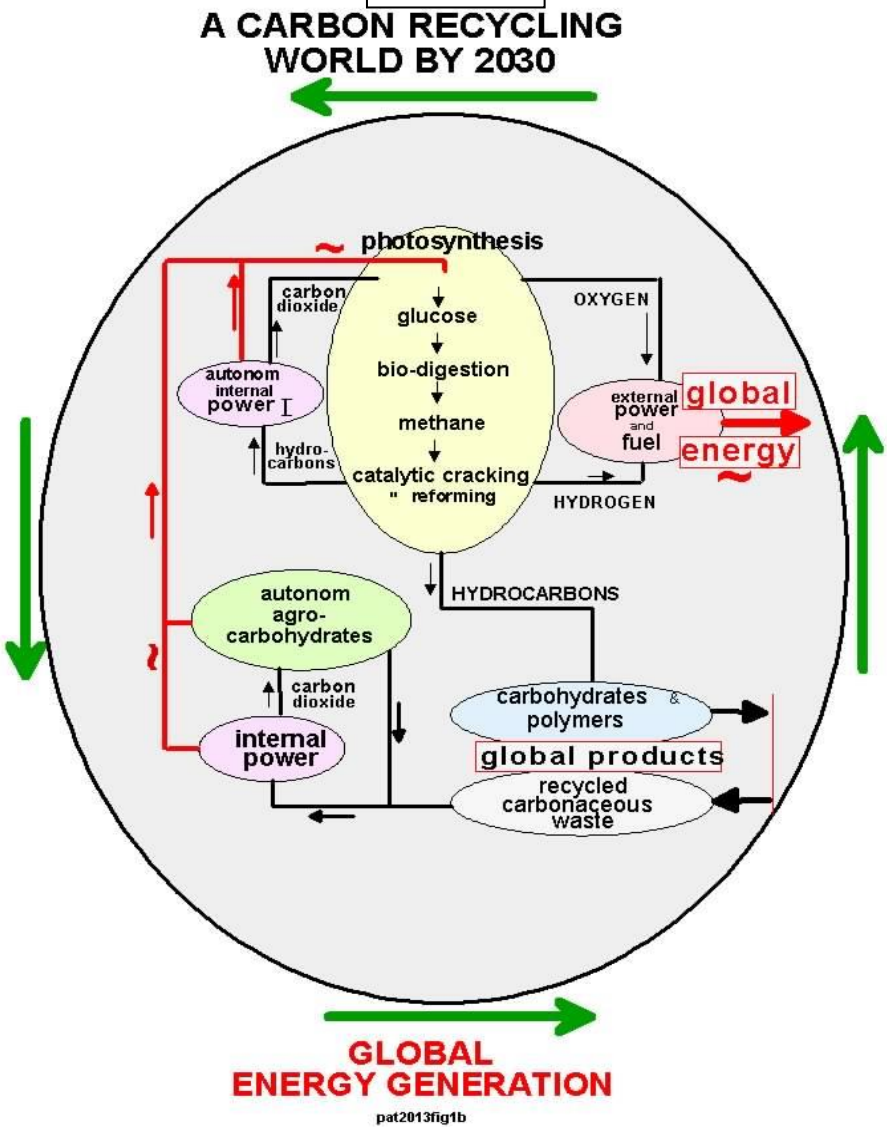
Chapter 5

Comprehensive systems involving global carbon and water recycling with power generation and carbon production systems

By 2025 the remaining fossil fuels still in the earth´s crust must remain there and according to the present invention be replaced by a comprehensive permanent recycling of set amounts of the strategic element CARBON and the compound WATER.

Fig.7 illustrates the essential functioning of the present invention,

Fig.7

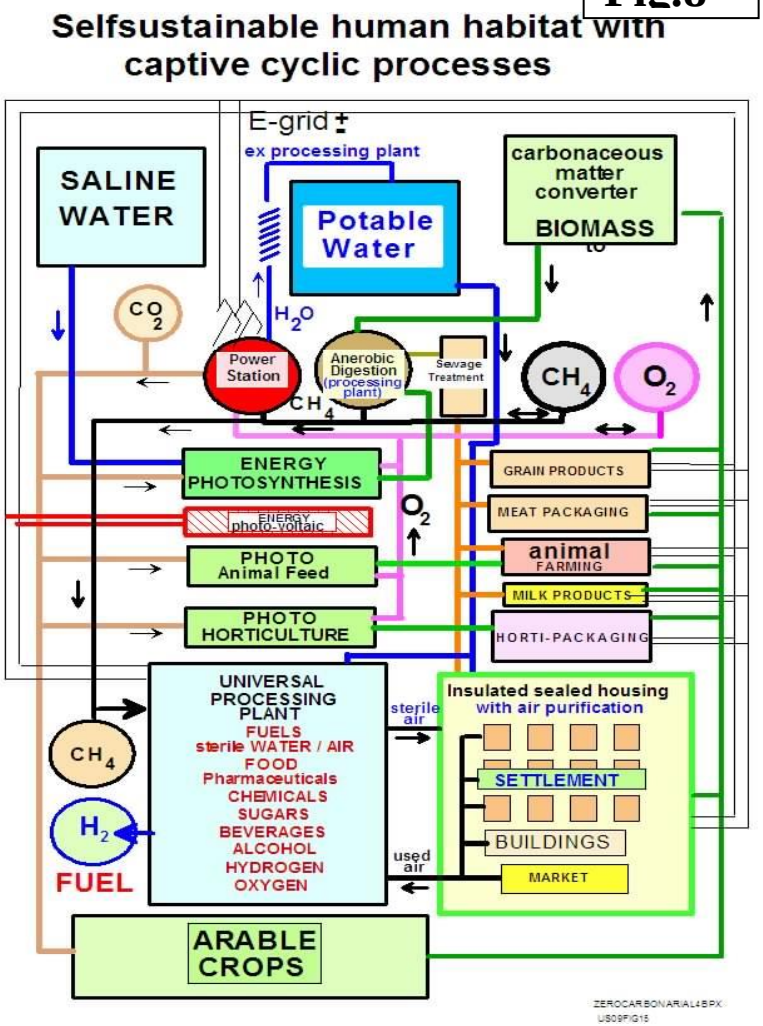


whereby the gases **OXYGEN** and **HYDROGEN** generated directly and indirectly by PHOTOSYNTHESIS supply the **complete domestic carbon-**

free global energy requirements and whereby the entire global industrial carbonaceous products are also completely recycled as fuel for supplying the **entire global industrial energy requirements**.
According to the present innovation carbon polymers and carbonaceous products will dominate in both industrial industries and domestic markets.
Global products will be designed to be entirely recycled as carbonaceous waste for internal industrial power generation, whereby the recovered and recycled carbon dioxide after purification is used further autonomic photosynthesis.
Comprehensive carbon recycling lies at the heart of the solution of today's global environmental pollution problems. The scheme illustrated in **Fig.8** represents ***one*** realisation of the diagram **Fig.7**

Carbon recycling oases spread across the globe !

Fig.8

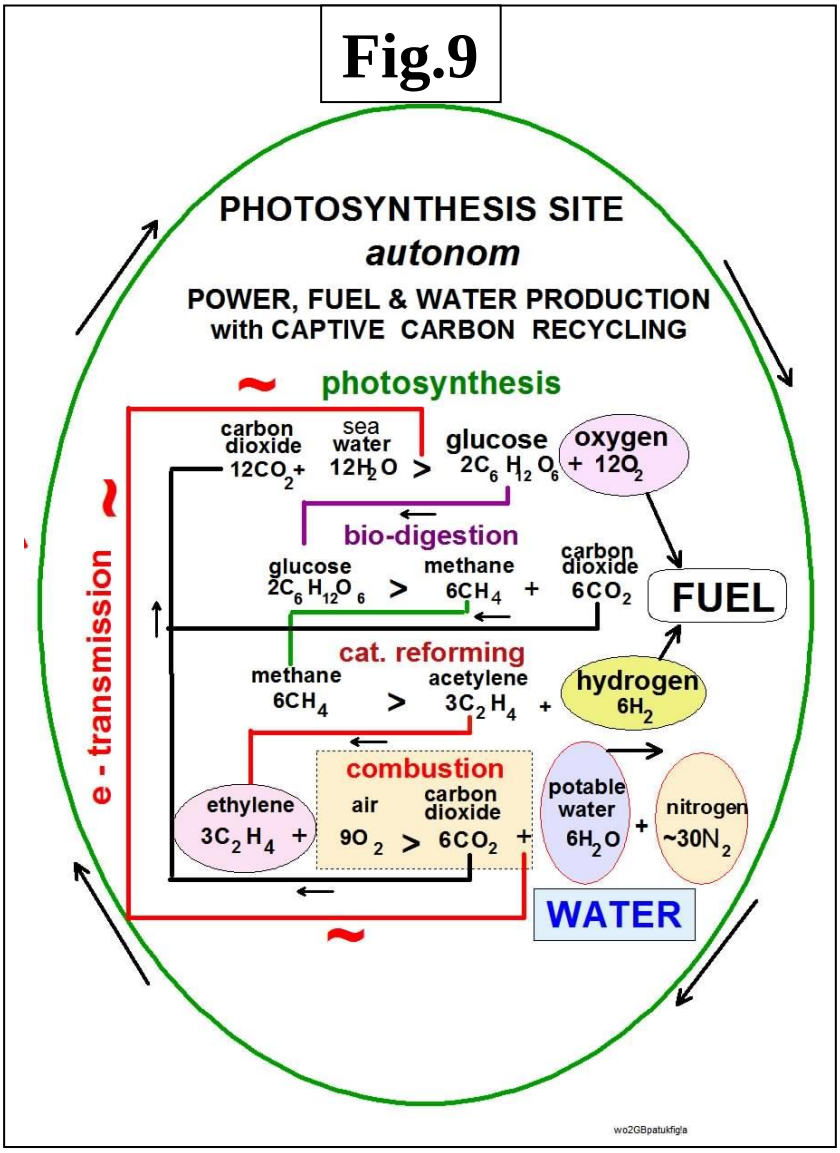


The central aspects are:

1) the **block** (top right) marked "***carbonaceous matter converter (BIOMASS).***
2) the **block** marked **ENERGY PHOTOSYNTHESIS (green)** whereby the energy for photosynthesising light generation is supplied by a power station supplied with methane from the anaerobic digestion of biomass fuel from **block 1),**

thus demonstrating the basic carbon recycling process of possible human habitats, ***whereby all carbonaceous waste is recycled with zero emissions into the environment***.

Fig.9 is a flow-sheet representing the autonomic recycling function of the present innovative photosynthesizing process.
The carbon dioxide generated in bio-digestion and energy generation is entirely recycled for continuous photosynthesizing, whereby zero damaging environmental emissions exist.



Non-carbon, zero-emission fuel (hydrogen and oxygen) is available for external consumers. Potentially this fuel has universal application possibilities.

Fig.10 illustrates a non-polluting, all-encompassing plant *(Miller Carbon/Water recycling with photosynthesized power and production systems)* designed to operate anywhere on the face of our and outer-space planets and solve the problems of contemporary sprawling, polluting petro/plants now producing the bulk of basic organic polymers,

Fig.10

UNIVERSAL CARBON RECYCLING, POWER, WATER & PRODUCTION SYSTEM

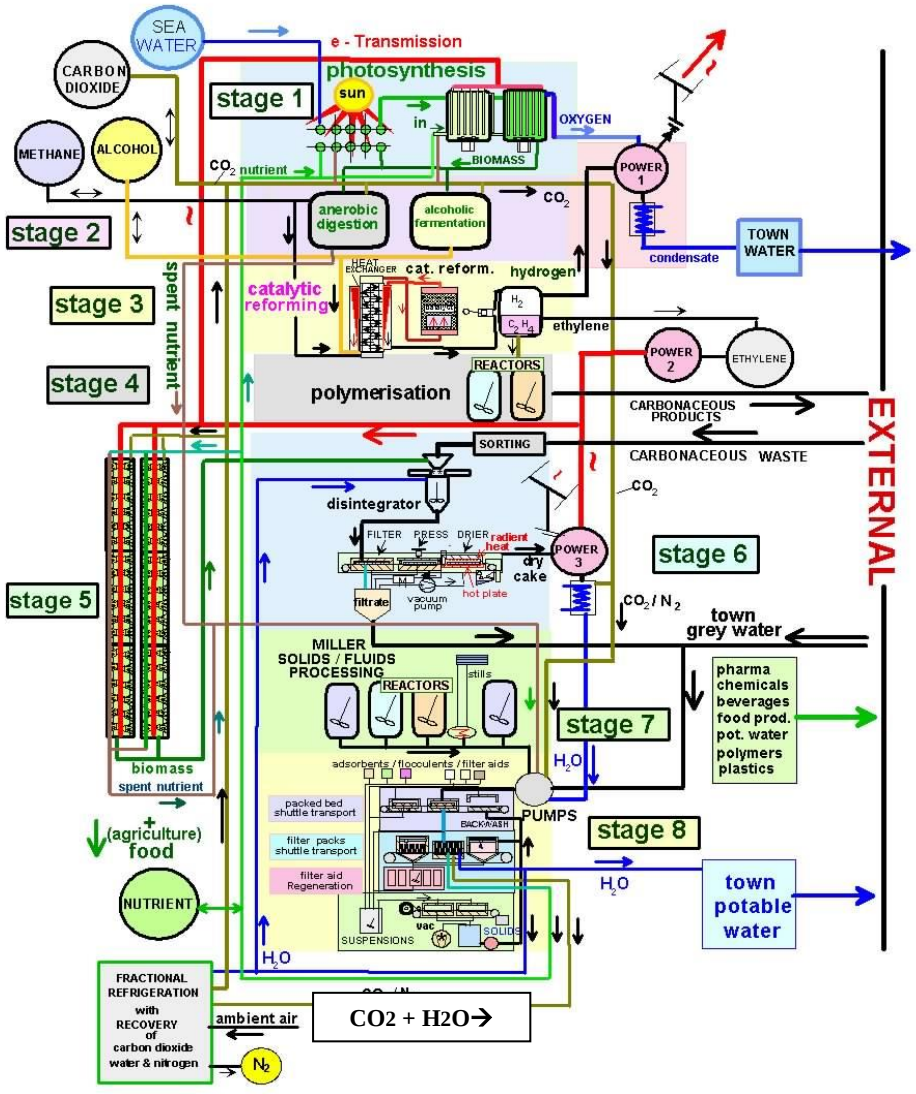


FIG5end2

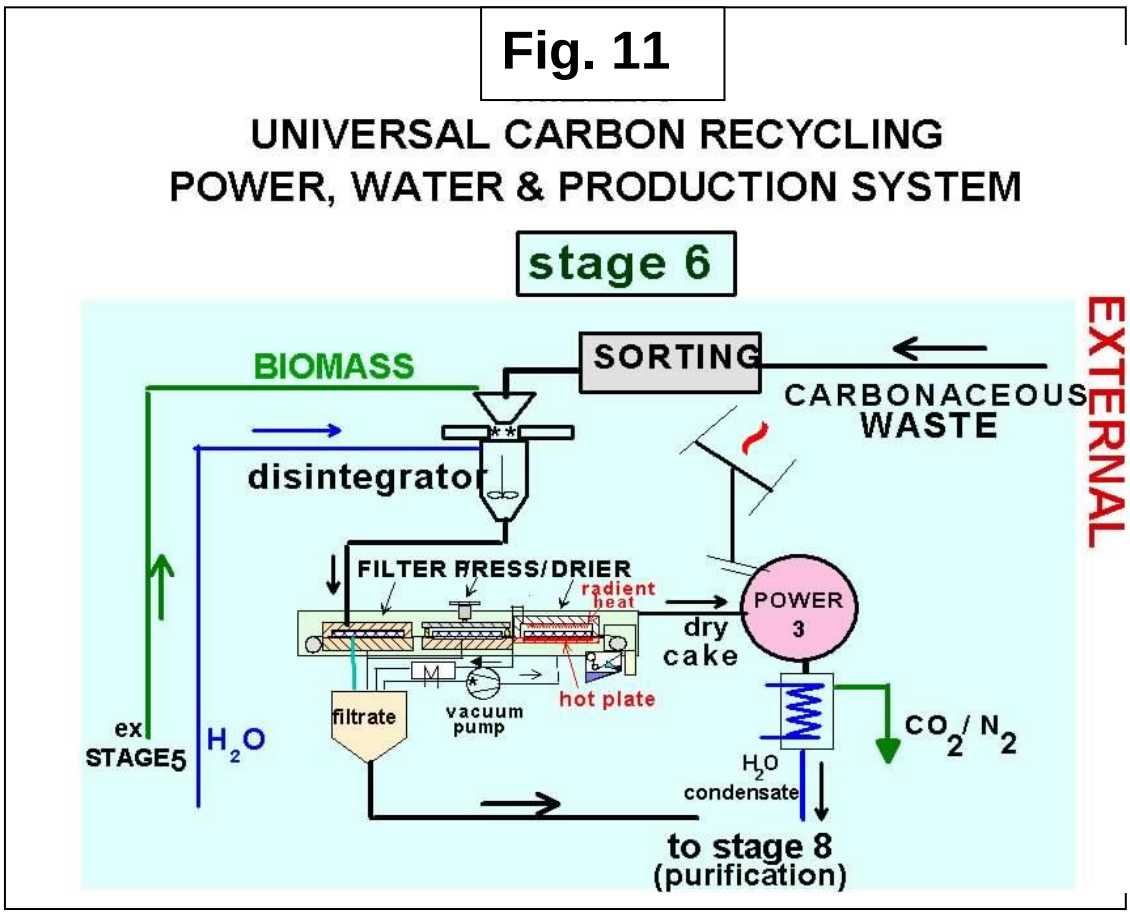
chemicals and consumer products based on global fossil-carbon deposits and used as raw materials by thousands of small or large

facilities for the production of a huge range chemicals, plastic-polymers, pharmaceutical specialties and many other products destined to be dumped after use as waste to add to the enormous mounds of rubbish now covering the face of the earth.
The Miller Systems provide solutions to these burgeoning problems.

Fig.11,Stage 6 ("WASTE SORTING & RECYCLING")

Similarly and simultaneously *recycled* communal carbonaceous waste material is first delivered to separate "sorting" departments after which selected material with recycled water is fed to a "disintegrator" and thence to a Miller-Filter-Press-Drier before conveyance to the power plant for incineration, power generation with carbon dioxide and water recycling.
Although large automated systems are already available for sorting metropolis waste a comprehensive recovery and recycling of the components of the waste material is still at an infancy stage.
This can only become a reality with an integrated control of both the production and waste recovery operations.

Fig. 11



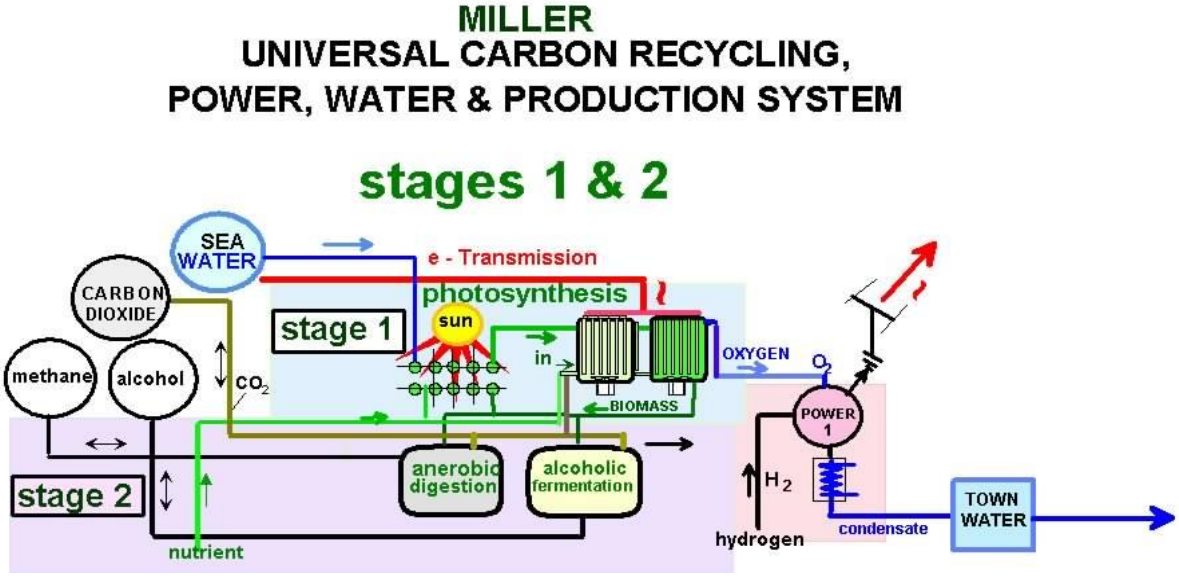
Claim 10

Figs.7-11 illustrate the full extent of the present invention that can be described as a *global production system for individual communities but includes the means for total carbon and water recycling combined with non-carbon power in systems* according to claims 1 & 9 whereby *global carbonaceous waste* after sorting, disintegration and separation in a "filter-press-drier"(Fig.11, p33) for delivery as a "dry cake" fuel for separate power stations producing as by-product condensed water for purification and recycling in plant illustrated in Figs 12a,b, (p.45-6).

Stages 1&2

Description

Seeded carbonated water is passed through a series of interconnected stirred photosynthesising vessels at a constant rate preferably provided with light reflecting inner surfaces. The vessels are fitted with candle- or plate-shaped e-powered radiating elements to produce either pulsed LASER, LED beams or any other forms of intensified light radiation with a frequency range suitable for the photosynthesis of plant life.



Importantly, the set-up is designed to cope with either intended or unintended shut-downs. Agitating propellers are designed to prevent or dislodge and resuspend any settled photosynthesised material and other extraneous

matter lying or tending to adhere to the internal surfaces of the reactor vessels or radiating candles.
This is an important feature of the overall design as many state-of-the-art photosynthesising devices fail due to persistent stagnation, unsanitary conditions and inadequate cleaning provisions.
The production of biomass lies at the heart of the new technology.
The growth of biomass is normally associated with **SOLAR PHOTOSYNTHESIS.**
However it is now widely recognized that in large areas of the temperate zones of the earth adverse seasonal weather conditions prevent an acceptable degree of sustainability to render solar-based biomass production operations commercially viable.
Illustrated in **Stages 1, 2** are quantities of stored compounds Inherent to the whole system.

This is the requirement for obtaining and storing “replenishment and buffer” quantities of essential intermediate products as contributions to the whole autonomic process.

- carbon dioxide (CO2)
- methane (CH4).
- ethylene (C2H4)
- oxygen (O2)
- hydrogen (H2).
- water (H2O)

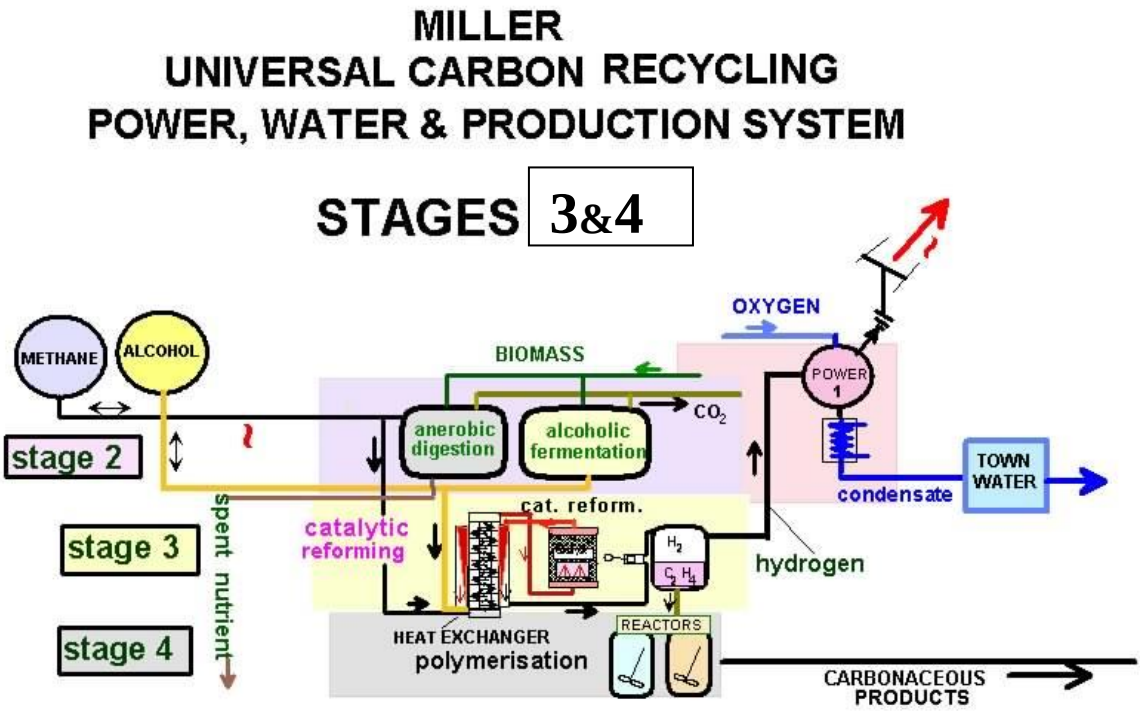
These “replenishment and buffer” quantities are sized to counter

1. the requirements of the 2nd Law of Thermodynamic concerning the inevitable continuous increase in entropy of closed thermal systems and
2. the worst case scenarios of failing sunshine to actuate any solar powered bioreactors, fluctuations in the internal and external demand for electric power and the dictates of the laws of thermodynamics.

Stage 2 (“BIODIGESTION”) is dedicated to a process widely employed by perhaps many millions of sewage treatment works around the globe for the degradation (“bio-digestion”) of organic waste material of human settlements and industrial complexes. Methane as the main by-product of this process is often collected and used for energy generation and as fuel.
The process can be plagued by sewage impurities that threaten the well-being of mainly bacterial microbes responsible for the breakdown of carbohydrates, fats, etc.

The present project will not normally be involved directly with the treatment of human or animal sewage. Although a plethora of technological studies and know-how are available on this topic there remains one key drawback that urgently requires correction:
The topic is known as **"grey water**" and can be described as the best available quality of the bulk of the aqueous sewage after bulk "aeration" and settling and removal as a thickened suspension that is subjected to bio-digestion with the evolution of methane and carbon dioxide gases.

Left over on a global basis are enormous quantities of this so-called **"grey water"** that are often discharged into the nearest natural water ways, lakes and oceans of the earth to the detriment of humanity but especially fish-life (a rough estimate of the daily global volume dumped into the environment is of the order 50 million m^3).
An important aspect of the present invention (**stage 8**) is the purification of this "grey water" to potable water standards. This is one of the central aspects of the recycling plan of the present disclosure.



Stage 3, catalytic reforming unit-operation is itself well known in fossil fuel refining and petrochemical plants across the globe. The application of a regenerative thermal heat-exchange function for this application is unknown to the present applicant. In respect to the present invention however a favourable overall energy efficiency of the entire system is of vital importance whereas such niceties are unlikely to be of the first order of priorities in fossil fuel refineries.
Illustrated is the separation of the components of the yield from the catalytic reforming process, namely, hydrogen and ethylene and their storage in buffer tanks for "buffering" purposes.
The fortuitous by-products **oxygen and hydrogen** from stages 1, 3 supply the fuel for the generation of electricity, heat and power for external consumption.
Hereby, efficiencies of power generation seldom if ever achieved by contemporary polluting fossil carbon fired power station can reduce the price of power to consumers considerably and simultaneously reduce the pollution of the environment to zero as water vapour is the sole emission. The present project will not directly deal with the primary treatment of human or animal sewage.

Stage 4 ("POLYMERISATION") is already a rapidly expanding key chemical process now dependent on existing global petrochemical plants. Future generations will become acquainted with an ever increasing number and quantity of products fabricated or composed of polymerised hydrocarbon material from photosynthesising sites.
The present widespread use of metals for both industrial and domestic goods can be largely replaced by synthesised carboniferous polymers reinforced with carbon fibres in an ever expanding carbon recycling marketplace.
The world could be heading for a new *"carbon-age" epoch, following on from the "stone", "copper", "bronze", "iron" and "steel" ages.*
Global photosynthesising sites could initiate the spearhead of this new era.

Claim 11

Stages 1-8 according to Claim 1 providing comprehensive facilities for the recycling of carbon, hydrogen and oxygen and essential nutrients together with the introduction of innovative autonomic photo synthesising systems and processes that provide an all pervasive solution to the present day rapidly worsening global environmental problems.

Chapter 6

Indoors photosynthesised agricultural and horticultural growth with recycling of all carbonaceous and inorganic fertilizing elements

Stage 5

Refer to Figs.12a,b (ps.39/40)

This stage for contained agriculture with purification and captive recycling and reuse of circulated fluids including ***recycled dissolved fertilizers, nutrients and carbon dioxide*** has the aspect of side-show. However this side-show could turn into one of the major attractions in a global recycling world.
For instance a well organised Genome Manipulation R&D program aimed at a 10-100 fold increase in the speed of photosynthesising processes under-pinning and leading to the direct growth and combustion of biomass for power generation as depicted in this stage could become a major feature of future carbon recycling facilities.
This goal requires the realization of the important ***interconnected technology of the present disclosures in Chapter 2:***

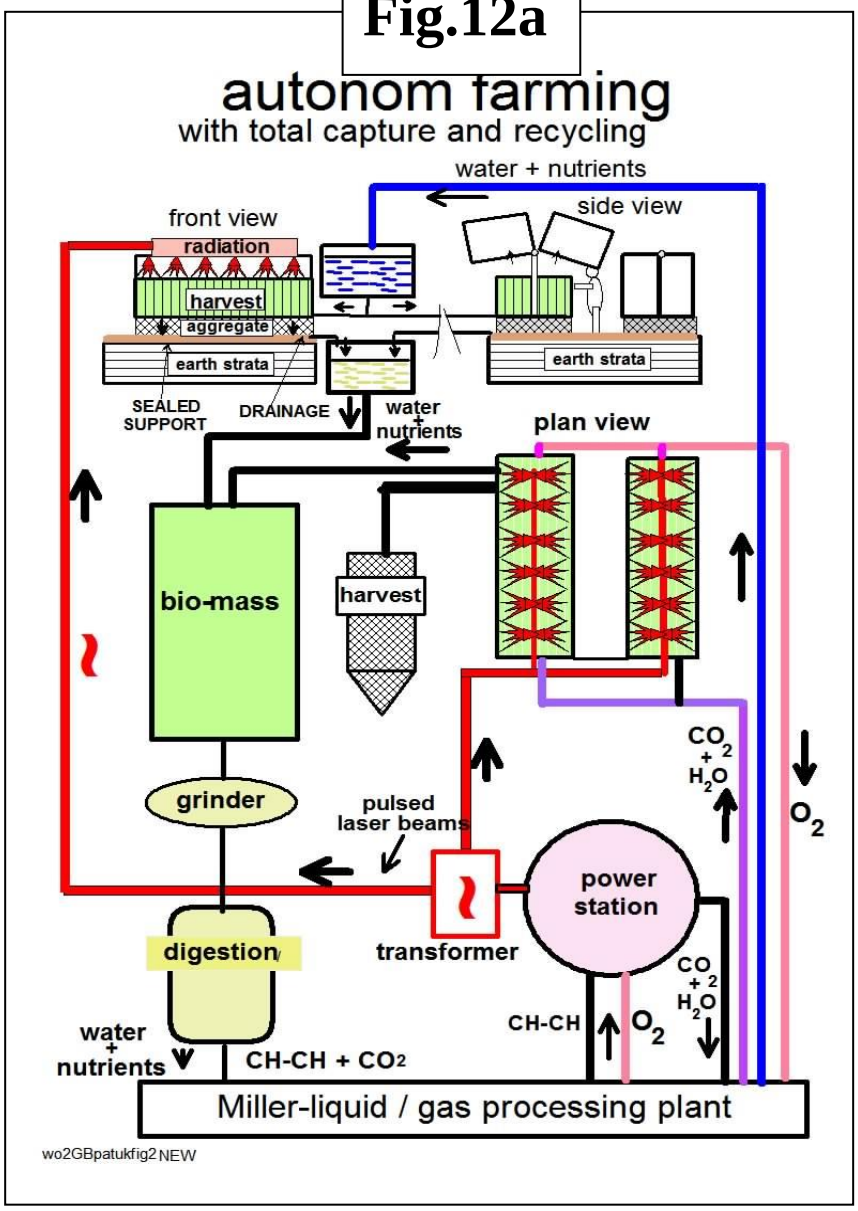
"The realization of advanced industrialized photo-synthesis"

The crops are completely sealed off from the external environment as well as the strata on which they rest which is covered and sealed by an *impervious layer* such as concrete.
The plant root systems are embedded in a resistant aggregate with a suitable range of grain sizes to provide the necessary root support supplied with *carbonated water* containing all dissolved essential nutrients continuously fed to and distributed throughout the entire aggregate layer. The crops are sealed under removable *hinged covers internally fitted with LASER* ***or LED*** *radiating elements*.

Compared with bio-digestion, the direct route of the combustion of carbohydrates for energy generation and carbon dioxide recovery and recycling is potentially far more productive and straight forward.
A central goal of the present project is to develop the schemes illustrated below whereby all future agriculture and horticulture will be carried out in a contained carbon dioxide gaseous and aqueous environment with artificial light and total recycling and reuse of nutrient solutions.
Further, the circulating carbon dioxide and nutrients will be maintained at a high level of quality, cleanliness and sterility by universal fluid purification

plants whereby provision of mechanical indoor harvesting facilities is also envisaged.

Fig.12a



Contemporary farming methods have changed little since the days of the pharaohs as still today the Nile provides the fertiliser nutrients on a regular and automatic basis, whereas in less fortunate parts of the world the bulk of NPK produced in large chemical plants eventually ends up either contaminating the earth's crust or supporting the growth of plankton in the world's oceans while simultaneously the deposits of phosphorous and potassium in the earth's crust are still sharing the destiny of fossil carbon and a host of other disappearing elements listed in the Table of Elements.

A further looming crisis is developing due to the disappearance of increasingly rare raw materials with no sign of a solution.
Compared with bio-digestion, the direct route of the combustion of carbohydrates for energy generation and carbon dioxide recycling is potentially more productive and straight forward.

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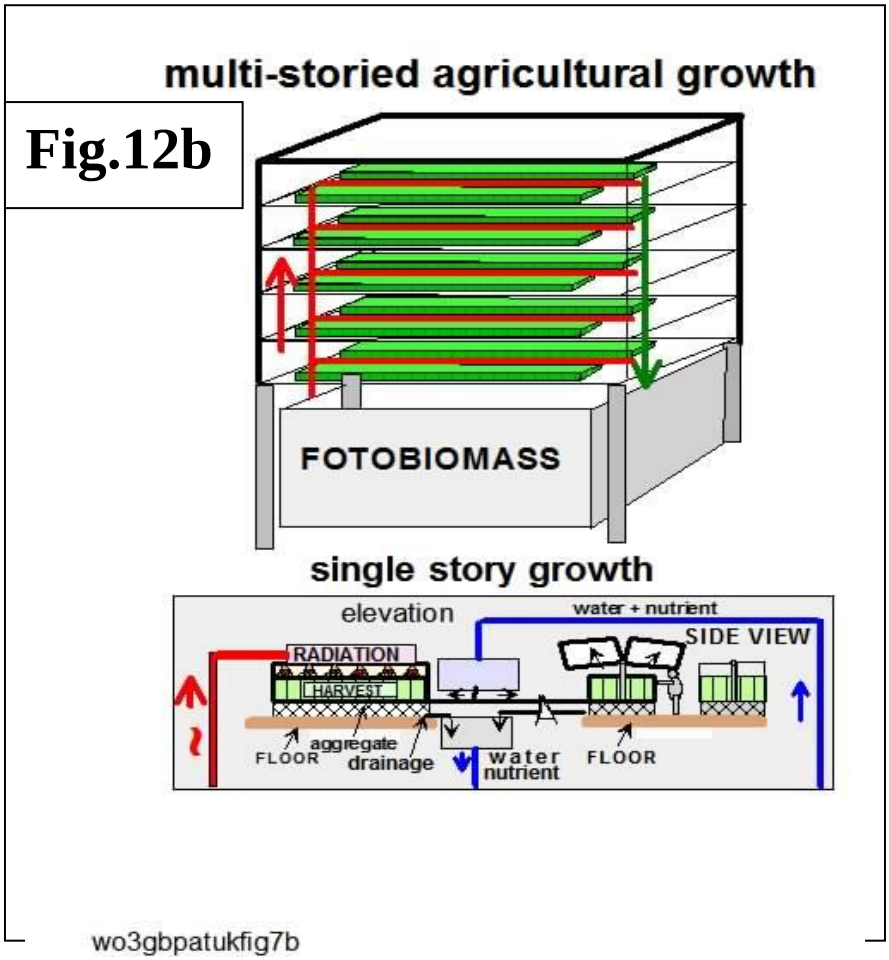


Due to worldwide ignorance on the part of governments and industries *it has become fashionable to believe that an overall solution to the worsening environmental problem is unaffordable and perhaps terminally damaging to global GDPs.*
Recent international political activity points to the continuing trend of communities wanting to become independent of outside supplies of basic food and other commodities.
Fulfilling this need will however for many of the regions of the planet remain wishful thinking unless new innovative infrastructure and methods of food production are realized.

That many parts of the world are dependent on grain deliveries from for example America and Australia for their very survival is unacceptable in an age when serious plans are being hatched for the establishment of human settlements in outer space.
Recent rapid increases in the global cost of primary food resources must pave the way in the search for more productive agricultural methods suitable for application anywhere on the planet. Traditional agriculture is failing in many regions of the earth due to adverse climatic conditions. With the present rapid increase in world population dire predictions of mass starvation are becoming more and more credible.
Leaving plans for human settlements in outer space aside, ***the priority on our planet*** should be independent of the external environment and the vagaries of global weather patterns to develop agricultural systems for human settlements that are self-sustainable and with a high degree of recovery and recycling of the bulk of the growth matter for use as fuel as well as the nutrient components In the aqueous phase would be simultaneously achieved.

Claim 12

Sealed indoor agricultural growth systems entirely separated from the external natural environment according to Figs 12a,b whereby the plan already described in Chapter 2 to replace the consumption of fossilized carbon as the major raw material for the ever burgeoning and environmental polluting global chemical and pharmaceutical industries with LASER and LED photo-synthesizing techniques adapted to the entire extent of the present global agricultural industries now almost wholly dependent on the vagaries of the natural environment, whereby present agricultural land can be returned to its natural functions.

This is similar to the near autonomic agricultural and food products that could be produced in almost identical photo-synthesising equipment with each site eventually nourishing surrounding communities with 1-2 million inhabitants.
According to the present invention NPK (nitrogen, phosphorus, potassium) will be continuously recycled in sealed automated growth systems.
The present day situation where vast quantities of fruit, vegetables, meat, fish, etc. are carted across the face of the planet, often without refrigeration, is beyond comprehension. Often the sources of such commodities are unknown.
The technology and methods of today's horticulture and agriculture is largely rooted in the past.
Present day burgeoning fish farming techniques are glaring examples of how best to poison large sections of human or animal populations.
Despite complaints and warnings concerning the consequences of the increasing pollution of the earth's strata due to excessive use of fertilisers and pesticides and the invasion and pollution of the global ground and therefore potable water resources, little is being achieved to regulate or diminish these practices.

Chapter 7

Global switch from metals to recyclable polymeric hydrocarbons together with automated production and recycling facilities for universal application in the whole gamut of chemical, pharmaceutical, water and food production for modern industrialized communities.

Although large automated systems are already available for sorting metropolis waste a comprehensive recovery and recycling of the components of the waste material is still at an infancy stage. This can only become a reality with an integrated control of both the production and waste recovery operations.
When waste disposal systems are made integral with the production systems of proposed photosynthesising sites an increasing interest and cooperation of the populations surrounding and running these sites as well as associated industrial facilities will eventually result in the identification, recovery and recycling of a specified number of key raw materials to end the proliferation of the present plunder of the 105 elements of the periodic table still left in the earth's crust.

Claim 13

Universal carbon recycling, power, water and production systems according to Claim 1, whereby global carbonaceous waste is recycled after sorting, disintegration and separation in a "filter-press-drier" for delivery as a "dry cake" fuel for separate power stations producing as a by-product condensed water for purification in plant illustrated in Fig.18b or Fig.19 and carbon dioxide for recycling to autonom photosynthesising processes

Stages 7 & 8

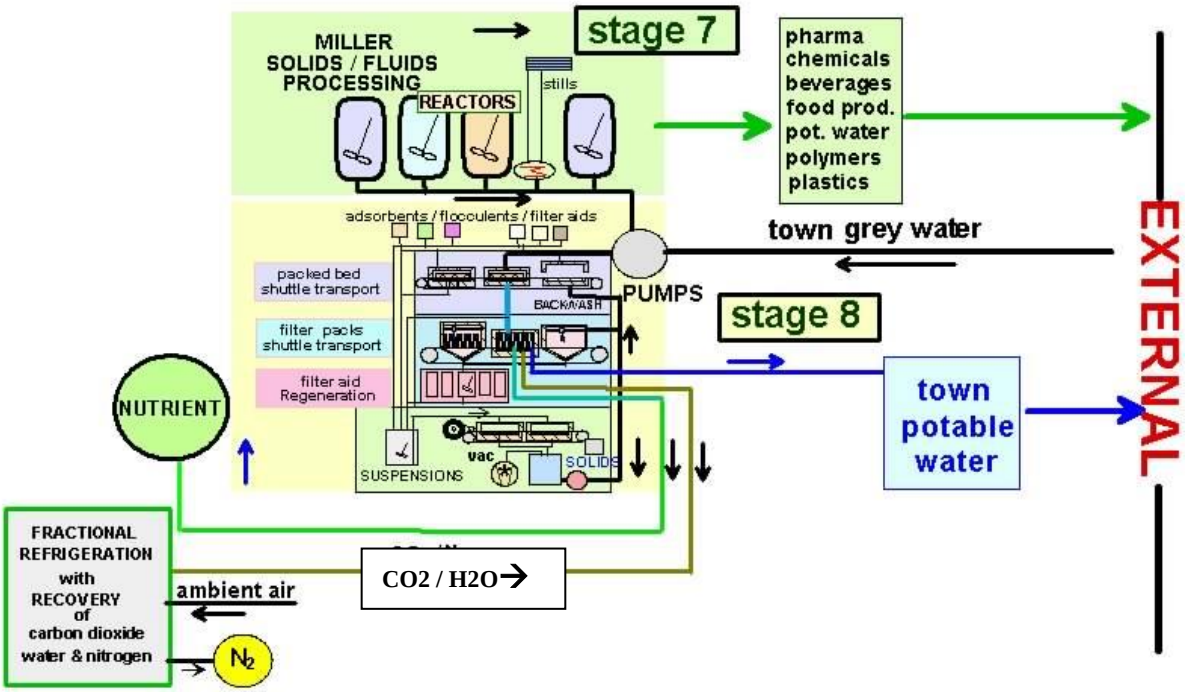


FIG5end2

Although systems are already available for proposed photosynthesising sites an increasing interest and cooperation of the populations surrounding and running these sites as well as associated industrial facilities will eventually result in the identification, recovery and recycling of a specified number of key raw materials suitable for recycling to reduce the proliferation of the present plunder of the 105 elements of the periodic table still left in the earth's crust. The proposed photosynthesising sites also concentrate on the production of products such as pharmaceuticals, chemicals, beverages, sugars, foodstuffs, petrochemicals and potable water Such products are for example now produced by a host of conventional chemical, pharmaceutical, beverages, petrochemical, municipal water and other miscellaneous industries.
These separate industries believe they are carrying out specialised operations requiring specialised production equipment.
This is not the case!
"Many of these industries continue to be serious polluters of the environment, whereby they all claim they are following the letter and goal of the law in employing (quote)*".*

Buffer stocks of Carbon Dioxide, Water from the fractional refrigeration of ambient Air

Plants of the present invention are designed for “across the board” universal application with the complete elimination of polluted fluid effluent and emissions into the environment.

As an example it can be demonstrated that with a single plant when served by fully automatic cleaning (CIP) systems and backed up by liquid purification, solids recovery and recycling systems as in **Stage 8** it is possible to produce on a weekly basis all the basic buffer stocks of chemicals and products required by the photosynthesising systems described in this presentation.

Claim 14

Essential recovery system according to Claim 1 and Stage 8 (p. 43) whereby by means of fractionised freezing, carbon dioxide and water are economically extracted from the environmental air, firstly to replenish stored stocks of these compounds to maintain the centralized photosynthesising processes and secondly to enable the ideal concentration of these compounds in the earth’s atmosphere and crust to be maintained.

The patent specification in **GB2465762: “UNIVERSAL FLUID PURIFICATION SYSTEMS”** (download **www.ipo.gov.uk)** discloses key technology at the centre of the proposed photosynthesising sites:

Plants of the present invention are designed for “across the board” universal application including the complete elimination of polluted fluid effluent and emissions.

Although large automated systems are already available for sorting metropolis waste a comprehensive recovery and recycling of the components of the waste material is still at an infancy stage.

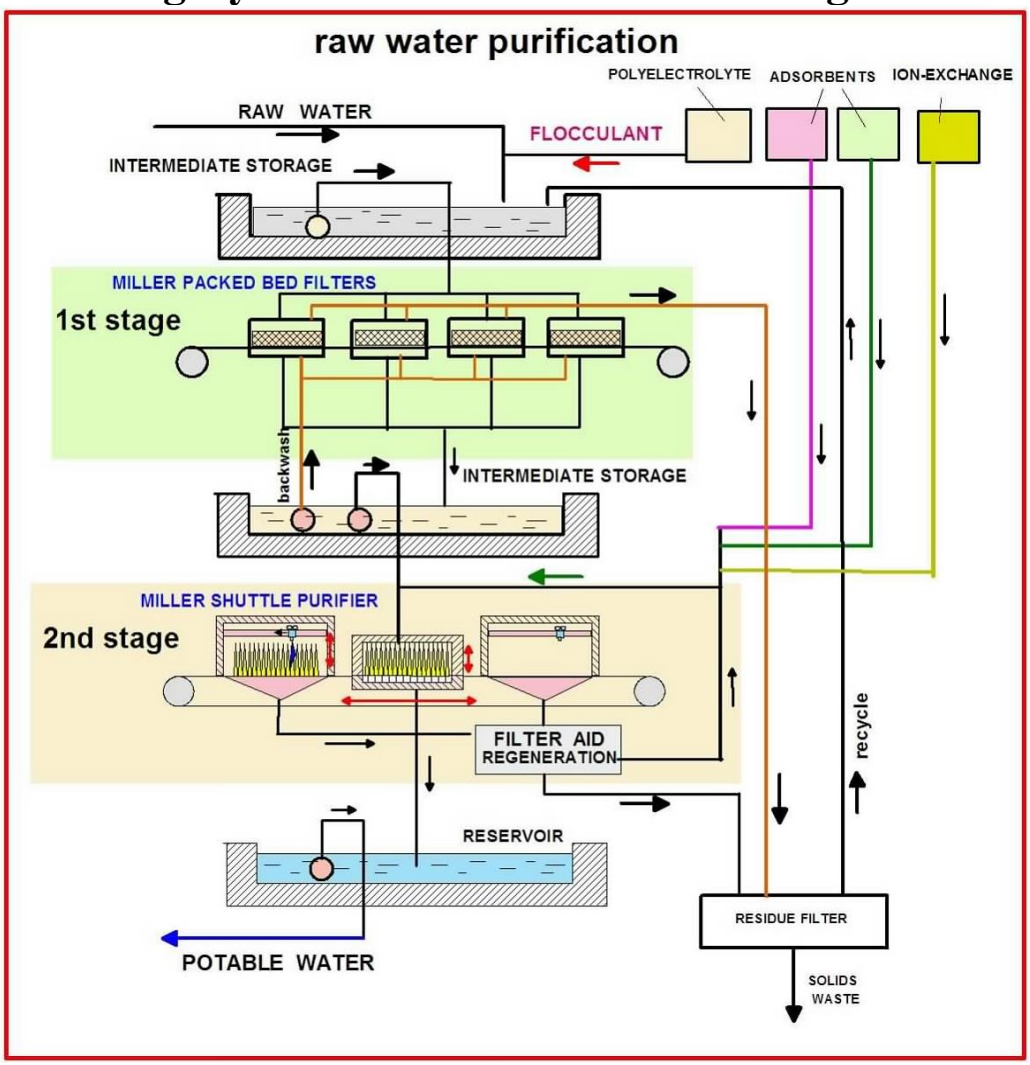
This can only become a reality with an integrated global control of both the production and waste recovery operations.

Chapter 8
Industrial and municipal waste water purification and recycling

As an example it can be demonstrated that with a single plant it is possible to produce on a weekly basis when served by fully automatic cleaning (CIP) systems and backed up by liquid purification, solids recovery and recycling systems as in **Stage 8b**.The patent specification in **GB2465762: "UNIVERSAL FLUID PURIFICATION SYSTEMS"** (download www.ipo.gov.uk) discloses key technology at the centre of the proposed photosynthesising sites.

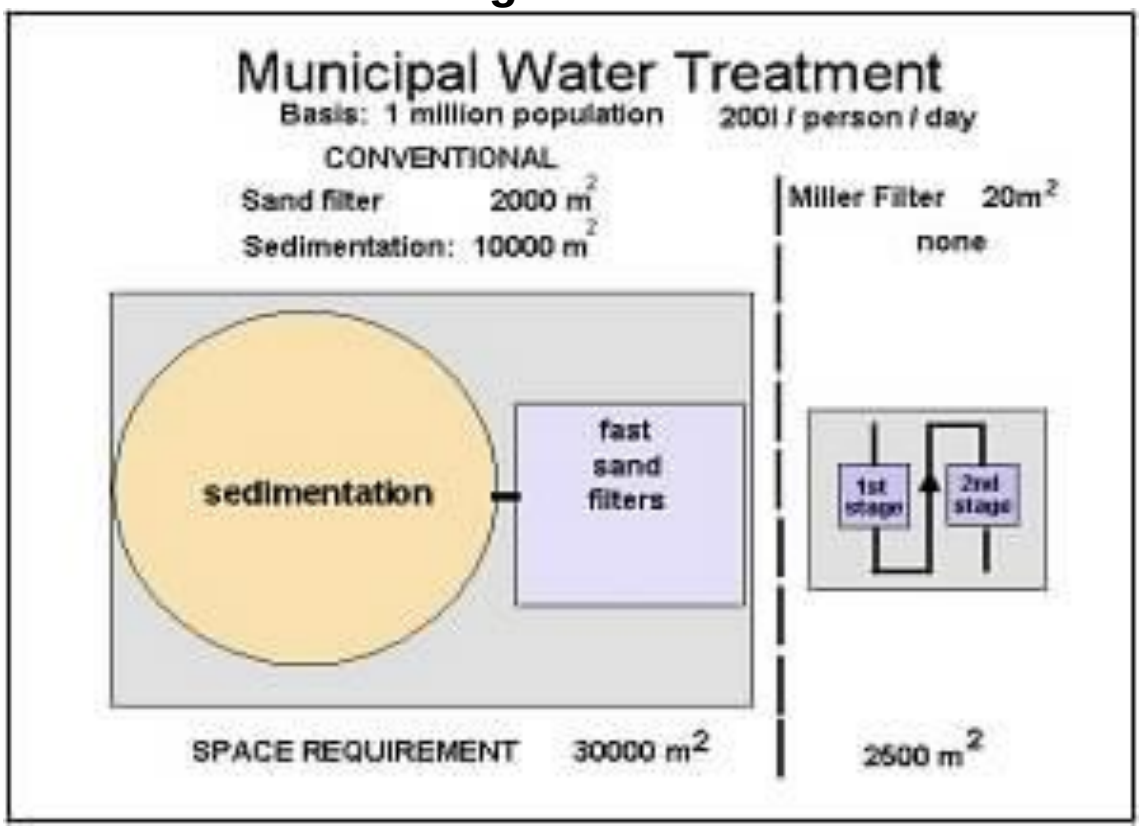
Fig.12a

Town "grey water" > Town "drinking water"



Recycling, recovery and production processes are achieved by
"*fluid purification means consisting of contained transportable filter bands whereby fluid purification means comprising these filter bands are arranged to move intermittently over plane pervious support members that engage peripherally to seal overlying sections of the stationary filter band to form a space or spaces into which fluid is delivered and allowed to exit through the sealed section or sections of filter band by means of pressure differential, whereby a section or sections of the filter band or fluid purification*

Fig.12b



members integral with sealed sections or solids material deposited on such sections are transferred to further planar support members enabling further distinctive operational procedures to be carried out".
For centuries solutions of serious environmental pollution problems have been and still are only partially realised. The seas, waterways, earth crust and atmosphere continue to be subjected to worsening largely irreversible pollution.

Chapter 9

The advantages accruing from the conversion of existing petro- to photo-chemical and -pharmaceutical industries

Practically all the vast rapidly expanding worldwide chemical and pharmaceutical industries are dependent mainly on fossilized carbon in the form of liquids or gases extracted from the earth's crust as raw material for their vast global production programmes.

Practically all these industries are erected on or near waterways (fresh or sea water).

The obvious reason for such locations is to "solve" their particular liquid and gaseous waste emissions problems.

Over centuries "cosy" relationships have been established with mainly world-wide governmental environmental "protection" agencies to protect their financial interests.

Chapter 3. "Innovative industrial recycling technology" and Chapter 5 "Comprehensive systems involving global carbon and water recycling with power and carbon production systems" describe in some detail how these sprawling polluting installations can be converted to centralized industrial photo-synthesizing production **sealed off from the environment** with a far more extensive spectrum of carbonized production of consumer goods with the added advantage of providing the surrounding populations with recycled purified water and non-carbon electric power supply.

Claim 15

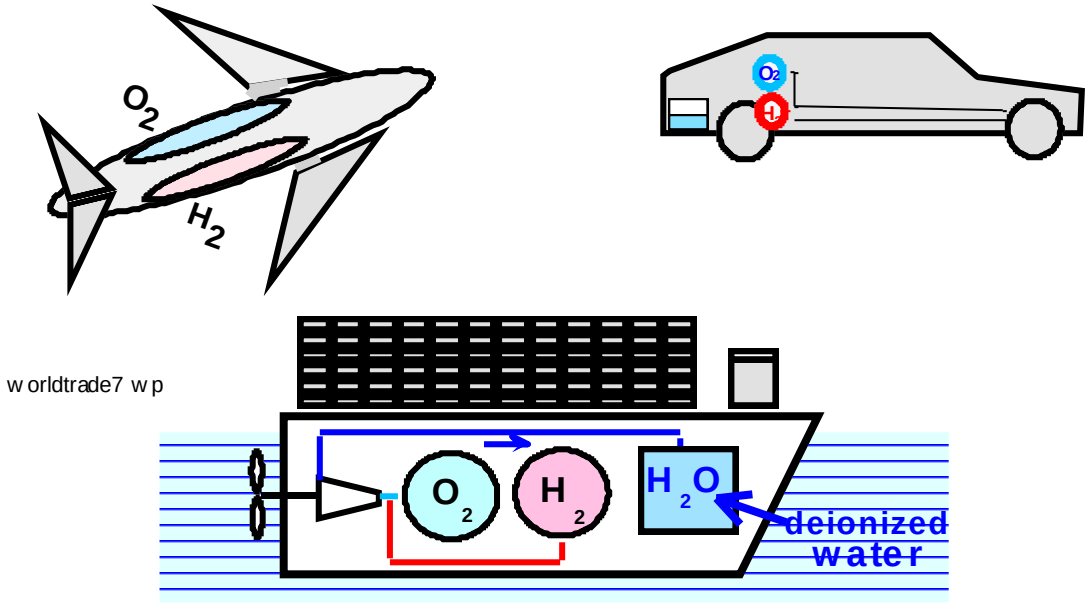
Centralized industrial photosynthesizing production systems sealed off from the environment with a far more extensive spectrum of carbonized production of consumer goods with the added advantage of providing the surrounding populations with recycled purified water and non-emitting power supply.

Chapter 10

Global trend to switch from fossil fuels to photo-synthesised hydrogen and oxygen for all forms of transport requirements on land, at sea and in the air.

Fig.13

oxygen / hydrogen **fuelled** **transport**



w orldtrade7 w p

Put an end to the ever-increasing discharge of global warming and noxious exhaust gases from all means of global transport and ever growing mounds of rusting wrecks of dumped automobiles across the whole extent of our planet !

The technologies described in this publication provide solutions that are within grasping distance!

According to the present combination of inventions unlimited quantities of affordable ***hydrogen, oxygen and electric power*** for all means of transport can be made available. The means to design and manufacture cars almost wholly consisting of carbon based ***weather resistant polymers and fibers*** in photosynthesising processes, whereby at the end of their life-span they are wholly recycled as fuel for electric energy and carbon dioxide recovery in the same facilities that produced them !

Claim 16

Global availability of HYDROGEN, OXYGEN and ELECTRIC POWER for ZERO ENVIRONMENTAL POLUTION of the atmosphere for all forms of transport.

Accruing advantages for mankind from the realisation of the above innovative measures

Claim 17

- **A world with maximum control over the liquid and gaseous quality of the environment**
- **Elimination of further plunder of the raw materials of the earth's crust**
- **Elimination of all pollution of the rivers, lakes, seas and oceans of the planet**
- **A permanent return of the former natural fish- , land-animal and forest reserves**
- **Complete elimination of industrial and domestic emissions and dumping into the environment and an end to the seemingly unending warring behaviour of homo-sapiens.**

Advanced industrial photosynthesis

CONCLUSION

The fossil fuel giants and their associates, despite worsening climate change, the rapidly dwindling residual fossil carbon in the earth´s crust and recent climate conference in Paris show no signs that there will be any meaningful change in the ingrained habits developed and practiced over the whole extent of the globe during previous centuries!

In certain respects their behavior is understandable!

There is still no apparent suitable alternative to fossil carbon to enable the profitable continuation of the expansion of fuel-driven transport, e-power and raw materials to underpin the vast global conglomerates making up the present and future expansion of the world-wide provision of a host of industries; especially the petro-chemical and pharmaceutical companies as well as energy generating groups for an expanding global population.

The present author believes however that the technology briefly described in the present publication does have the potential for providing comprehensive and favorable economical solutions to the looming existential problems now threatening our world.

However, opponents are already at play to stop the present inventor and author in his tracks!

This is also understandable as the forces at work to retain and further expand the status-quo are becoming increasingly obvious.