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VIRIDISCURA

Leading Sustainable Energy

G COR (GREEN CONVERSION OF REFUSE)

ALTERNATIVE ENERGY PRODUCTION

WASTE MANAGEMENT SOLUTION

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Redlin AG

Green Conversion of Refuse

TO WATER

TO ENERGY

TO DIESEL

TO GAS

TO HYDROGEN

TO AMMOINA

TO METHANOL

TO E FUEL

Inside this issue:

How to achieve 100% recycling of used and non useable products and reduce CO2 emissions.

Process for turning used and or non-usable items into usable items is called recycling. The worldwide percentage of recycling what is commonly known as waste is approx. 14% 86% is not recycled. Material which is polluting the environment in landfill sites worldwide or millions of tons of plastic floating in the oceans and rivers harmful to the marine animals and polluting many coastal areas. Landfill sites with leakage polluting rivers and groundwater. Landfill decomposition produces toxic elements such as Dioxin, Furans which is being inhaled and causing lung problems and increasing cancer illness. Methan gas more harmful to the environment than CO2 is. In many European countries waste material is separated by using different Containers for different materials and still the majority of waste Material us not recycled. This System cannot be implemented worldwide. Required is a technology which can recycle 100% of all materials even when the materials are not separated. Which can make out of the otherwise non usable materials usable products such as "Hydrogen - Methanol - Ammonia – E Fuels " Using our "G Cor High Temperature Gasification process " 100% recycling is achieved and is CO2 neutral. G Cor technology can also help reducing the amount of pollution caused by landfill sites worldwide. Usable products help reduce the amount if CO2 Otherwise produced by industrial companies Example: the production of 1 ton of Steel produces 2 tons of CO2. 50 kg of Hydrogen is required to produce 1 ton of Steel producing Zero CO2 .

What is G COR

GROUND-BREAKING TECHNOLOGY FROM GERMANY

TOTAL WASTE DISPOSAL

. . . using the state-of-the-art technologies from the steel industries radically adapted for new purpose, gasification from MSW (municipal solid waste) to highly toxic - any kind of waste

G COR pushing the boundaries of waste processing using High Temperature Gasification Technology

- Independent studies show GCOR superior net energy efficiency and clean syngas production, assuring long-term energy price stability
- G COR gasification process transforms 97-99% of all types of waste into gas, heat, steam and electricity (or diesel, gasoline, methanol)
- Single site gasification of all waste types with high & low CV's mixed, needing no pre-sorting or shredding, thus giving control of profit targets
- Zero emission and no ash residue, leaving 1-3% dusts and salts. With G COR, "zero waste" now becomes a reality, also reducing disposal costs
- Scalable from small single or multi-location sites, to large industrial plants. Economically integrated into existing infrastructures

Environmentally safe and operating between 1500°C (2700 F) and 2500°C (4500 F), G COR can process mixed municipal and industrial waste such as:

Toxic Waste	Electronic Scrap	Industry Waste
Lacquers	Asbestos	Compound Materials
Paints	Scrap Metal	Oil Sludge
Used Tires	Clinical Waste	Coal Gangue. . . .
Rubber	Paper	

... IN FACT, ANYTHING EXCEPT NUCLEAR CONTAMINATED WASTE

G COR - A FRESH VIEW ON WASTE PROCESSING

Adapted for new purpose, G COR gasification technology is a consequent development of the state-of-the-art metallurgical technologies from the foundry and steel industry, in existence for 200 years. The fully operational R&D plant in Arnstadt in Germany was tested under continuous operation in compliance with strict EC guidelines and 17. BImSchV (German Federal Emission Protection Decree).

G COR OPENS NEW HORIZONS

G COR unique control gasification process transforms all types of bulk waste into clean energy and inert re-usable products. Almost complete mass reduction - 1-3% of original volume remains for disposal, consisting of dusts mixed in non-toxic slurry. Superior net energy efficiency and consistent clean syngas production, assuring long-term energy price stability and equipment durability

G COR can process all waste types and high / low CV range mixed, needing no pre-sorting or shredding, thus giving control of profit targets. Scalable to small single and multi-location sites and large industrial size plants. Easily integrated into existing infrastructures

FEED MATERIALS (WASTE)

Household waste, industrial waste such as lacquers, paints, hazardous waste, waste from paper industry, used tiers, rubber, scrap metal, compound materials, asbestos, clinical waste, oil sludge, electronic scrap etc. anything except nuclear waste.

GASIFICATION INSTEAD OF INCINERATION

Gasification is the process of turning a sub-stance into gas. Due to a controlled and limited oxygen supply into the AEP process, combustion of the feed material is prevented. This is not incineration. There is no formation of typical combustion by-products like ash or smoke. With temperatures between 1500 - 2500°C, pollutants in the waste material such as dioxins, furans and Chromium Carbonyl (Cr6) are completely cracked into harmless or re-usable compounds.

VALUE PRODUCTS (OUTPUT)

High fuel quality synthesis gas for electricity, heat or methanol production

Heat for district heating, production of steam for industrial processes (e.g. paper mills) or in water desalination plants

A non-leaching fully vitrified glass slag, e.g. for further processing for the construction industry, containing minimal heavy metal oxide

A cast-able iron alloyed with heavy metals usable as ingots/pig iron for steel foundries

MARKETS FOR G COR GASIFICATION PLANTS

Private recycling-companies Local communities Processing industries

Waste recovery- and waste-disposal companies

Hydrogen facilities

Technology Development

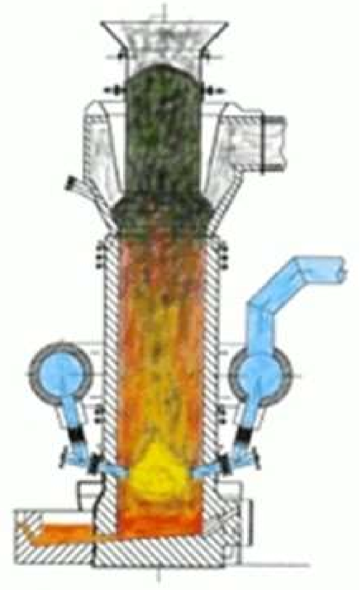
DEVELOPMENT OF AEP GASIFICATION TECHNOLOGY

Waste is an ever growing problem in today's society. In the future there will be more of it, containing more toxics than today.

Land filling is not a solution.

Incineration has many disadvantages.

In 1997 the goal of our research was to find a solution for the waste problem that would not pollute the environment, would make use of waste as a raw material and would give a real solution for hazardous wastes.



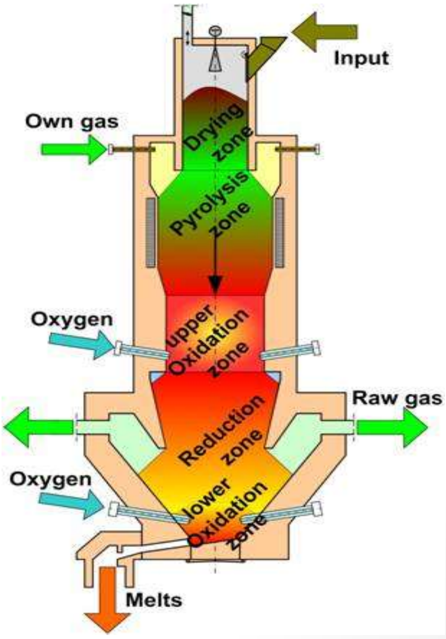
The Cupola Furnace Technology, which has been in use for more than

200 years in the metallurgy for the production of cast iron, was the base of the development of the AEP (AEP) gasification technology.

During years of development work by the KBI Group, the principle has been revised and adapted into the field of waste treatment, then painstakingly researched and developed. The essence of his patented technology is a high-temperature gasification reactor that works as a non-pressurized shaft-reactor, on the principle of predominantly direct cur- rent with a packed bed of feed materials (waste) and additional materials.

THE BASIC CHARACTERISTICS ARE:

- Environmentally responsible process
- The shaft furnace principle with controlled pyrolysis
- The use of technical oxygen
- The subsequent feeding of the shaft gases into the high- temperature area for conversion of the resulting pyrolysis products
- Gasification in a high-temperature area between 1500 - 2500° Celsius
- High efficiency conversion of all organic components into a clean fuel-quality synthesis gas and conversion to either electrical energy and / or heat, steam or methanol / diesel
- Close to 100% conversion of input material into value products under avoidance of almost all environmental impact



G COR GASIFICATION CAN PROCESS MIXED WASTE-STREAMS OF RANDOM COMPOSITIONS

Feed materials can be random waste substances or a specific mix. AEP gasification technology is intended for waste disposal of any kind (except radio-active). Organic content is turned into energy generation (gas, heat). Different plant designs are available for individual requirements set by waste types and capacities.

FOR INSTANCE:

- Household waste and bulky waste
- Mechanically treated waste (bulk waste, waste wood, old cars, car shredder residue)
- Industrial and trade waste Biological materials of any kind Hazardous waste
- Clinical waste
- Waste from paper industry
- Used tires, rubbers Scrap metal Compound materials Asbestos
- Coal Gangue
- Oil sludge....

... in fact any waste, except nuclear

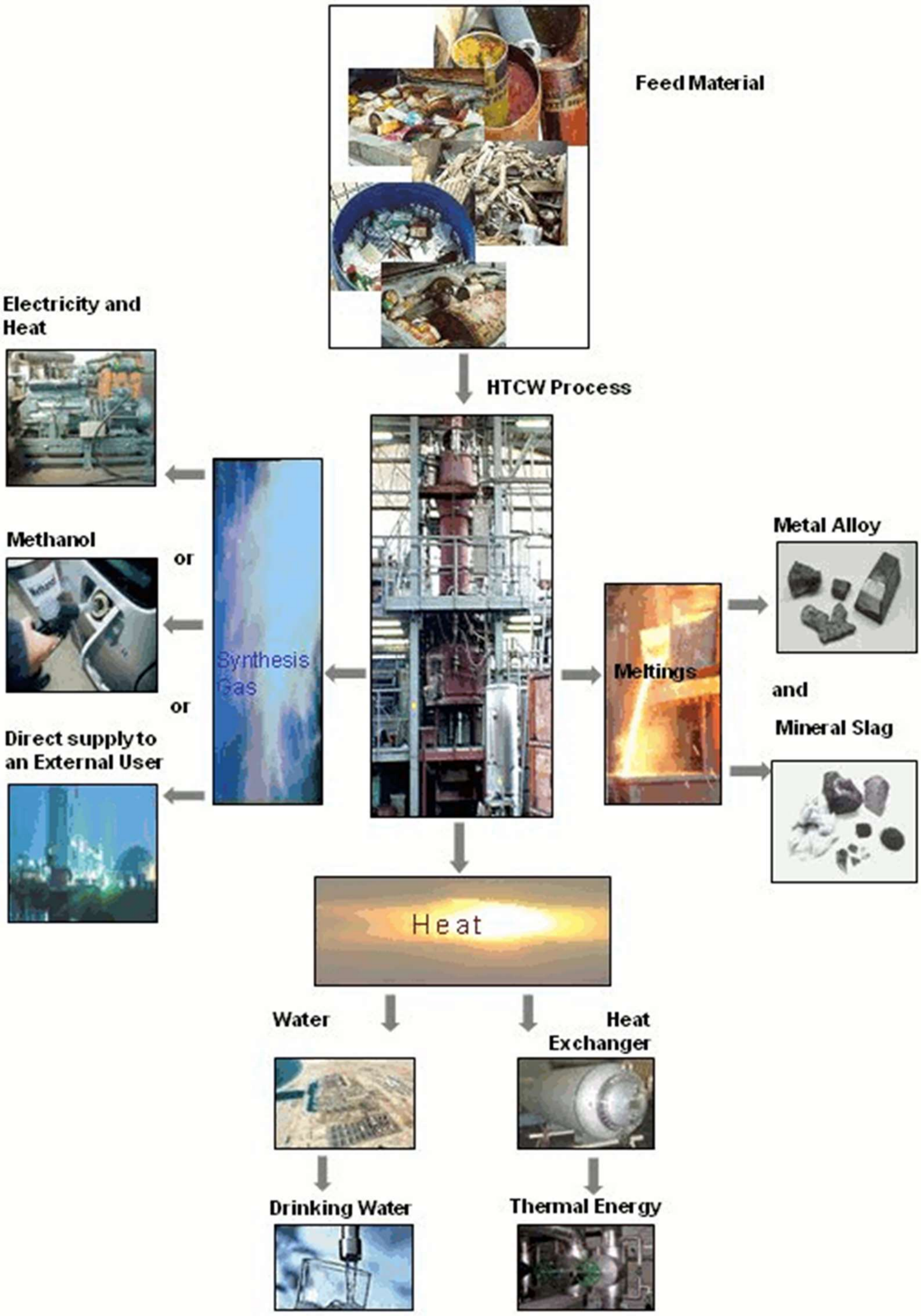
MINIMAL REQUIREMENTS:

- Optimum moisture range between 10 and 25 %. It is possible to process waste with higher moisture content by mixing it with other waste streams or use the reactor's heat for pre-drying.
- The mixed calorific value of the feed and additional material should be at least 12 MJ/kg. If less, addition of coke or other waste materials with a high calorific value is needed, such as wood or rubber.
- Particle size must be adjusted to the inlet of the AEP reactor (~ 500 mm).

Pre-sorting (removal of metals or mineral components e.g. stones) is not required, nor shredding. Depending on the composition of the feed material, addition of dusty and fine-grained substances can be added to the waste stream up to a certain ratio. This can also be in briquette form. In con- trolled quantities, liquids contained in solid waste or containers can be added.

From Waste to Value

FROM WASTE TO VALUE (INCOME SOURCES)



G COR GASIFICATION AND ECONOMY

G COR distinctive environmentally safe process disposes of mixed, hazardous and clinical wastes of all types. The inclusion of these toxic wastes provides un-paralleled flexibility to achieve target financial returns.

Zero emissions, ecologically neutral products, the use of all waste as a resource, high energy utilization and process-integrated pollutant destruction provide compelling arguments to allay concerns and objections from citizens and media.

Where decentralized AEP gasification plants are installed, waste tourism will be a thing of the past. They are easy to integrate into existing infrastructures and the lower economic risks (compared to the risk involved in large plants) provide further factors toward acceptance.

A New Approach to Profitability and Reputation

Highest net energy efficiency among competitors (i.e. net yields for sale to energy customers)

High quality clean syngas, preventing untimely wear and tear of expensive gas cleaning equipment

G COR gasification can process all waste types and high / low CV range mixed, needing no pre- sorting or shredding, thus giving control of profit targets - maximum customer service with single location processing

Almost 100% material transformation of the input waste into environmentally friendly products which can be sold at market prices. No exhaust gases and almost no disposal costs.

G COR Exports

G COR specifications are in accordance with German and European ecological technology standards and conditions and are among the best in the world. Based on a thorough market and business survey, adaptations will be made in compliance with local or national laws where applicable. Each project is bespoke designed according to specific requirements.

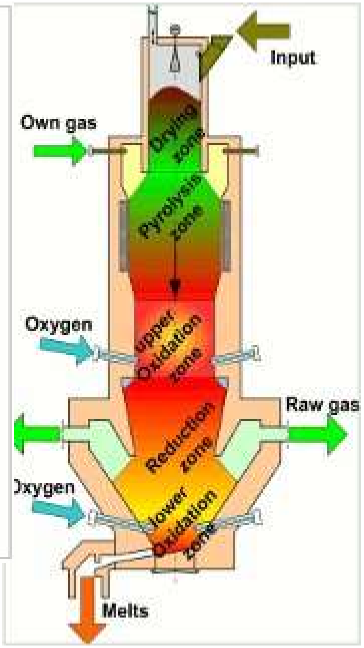
G COR modular design enables the planning of the most economical roll-out of a longer term expansion plan and avoids the biggest problems associated with smaller and also larger plants which require expansion when demand rises.

Investment costs

Investment costs of a G COR gasification plant depend on the configuration of the plant and type of gas and heat usage (for heat, electricity, methanol, diesel Hydrogen etc.).

THE G COR GASIFICATION ROCESS

Gasification occurs under temperatures between 1,500 and 2,500°Celsius under reduced conditions. Thus, a large share of hydrocarbon content is split inside the gasification reactor. Primary formation of dioxins and furans is practically impossible. Unlike conventional waste incineration processes, neither ash nor flue gas emerge.



Ideally, industrial-scale waste processing should result in:

- no or minimal pre- treatment
- optimum volume and mass reduction
- destruction of hazardous materials
- utilization of waste as a resource
- optimum energy potential utilization
- produce no or negligible
- residues for safe disposal

The G COR gasification process meets these standards by its efficient thermal and chemical transformation of highly diverse waste materials into energy and value products without adverse environmental effects.

Feed material (waste) needs only minimal preparation. Objects are reduced in size to fit into the reactor inlet and to prevent blockages once inside reactor shaft. Any metallic or mineral content is in fact advantageous to the process. Depending on the composition of the feed material, additional materials such as coke and limestone are added as needed. The various high-temperature melting gasification stages transform the physical and chemical characteristics of the feed material and thus volume is reduced. Synthesis gas, metals and vitrified slag are produced by the process, all of economic value.

The organic components descending down the furnace shaft are subject to a controlled pyrolytic de- composition and a gas is formed. This pyrolysis gas is fed into the high-temperature area. There it becomes a gasification agent with the aid of injected oxygen. With reaction temperatures between 1500 and up to

2,500°Celsius the organic compounds are decomposed into low-molecular substances. What sets AEP apart is its net efficiency, i.e. the net energy yield available for supply to an energy customer.

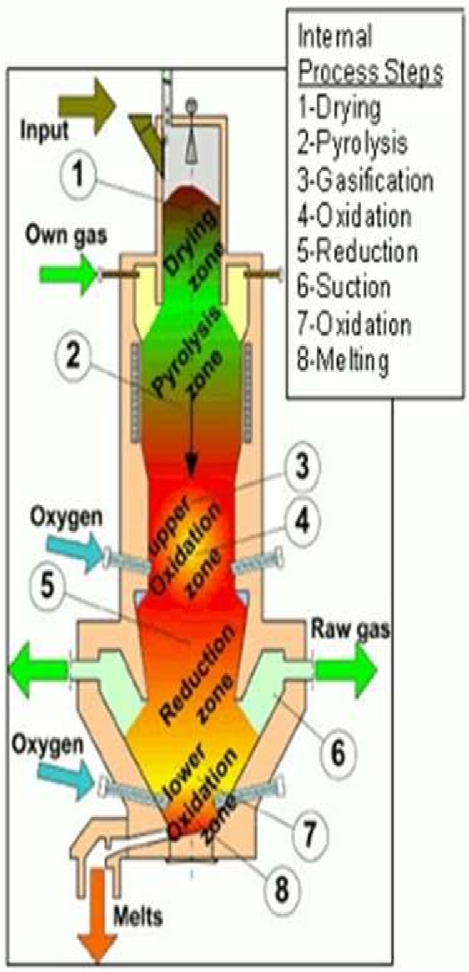
With the destruction of organics and the by now concentrated non-organic materials turned inert, the hazardous components are destroyed. The 1-3% remaining slurry of concentrated salts and dusts re- quire treatment and safe disposal.

PRINCIPLE OF A GASIFICATION FURNACE

Feed materials and additional materials at normal temperature and pressure

100 to 200°C:

Drying of input; elimination of physical water



250°C:

De-oxidation; de-sulphuration; elimination of constituents water and CO^2; de-polymerization; beginning elimination of H_2S

340°C:

Cracking of aliphatical bonds; beginning separation of CH_4 and other aliphates

380°C:

Carbonization

400°C:

Break-up of C-O and C-N-bonds; separation of heteroatoms

400-600°C:

Conversion of bitumen into smoldering oil and smoldering tar

600°C:

Cracking of bitumen into thermally stable substances (short chained, gaseous hydrocarbons); synthesis of aromatic hydrocarbons

800-1,200°C:

Gasification: Synthesis of N_2/NH^3 and H_2S/COS; halogens are completely in the vapor state (as alkali chloride or HCl) Melts: Synthesis of mineral melting phases

1,200-2,000°C:

Complete decomposition of aromatic hydrocarbons, HCN and organic chlorine compounds; formation of carbon black Melts: Synthesis of iron metallic melting phases

2,000°C-2,700°C:

Beginning of molecular dissociation; lower plasma region

Value Products

TAPPING

With the high temperatures and oxygen injection, partial oxidation occurs and so a complete melting of all mineral and metal components is achieved. The amount of minerals and metals in the waste determines the quantity of melting, which descends within the reactor by gravity.

The removal of these molten materials at the bottom of the reactor is called tapping. Mineral slag and metal melting's accumulate at the reactor hearth separate themselves due to different densities.

VALUE PRODUCTS

These are typical of processing by gasification at temperatures up to 2,500°Celsius. Depending on the feed materials content:

- A high quality fuel synthesis gas for electricity, heat or methanol production
- A non-leaching vitrified slag granulate, or fully glassed slag containing minimal heavy metal oxides, usable as road aggregate, flux for construction or with further processing as an insulation material
- A constable iron, alloyed with heavy metals usable as ingots/pig iron for steel foundries
- Heat, usable in various ways
- A concentrate from the gas cleaning,1-3% of the initial charge volume, which requires treatment and safe depositing (compared to about 30 % in waste incineration plants)

MINERAL SLAG

The vitrified clean slag is basically free from heavy metal oxides. These are almost completely removed while passing through the coke bed. The molten slag is continuously discharged and granulated. It can be used in any other form as a useful material like road aggregate or with further processing into insulation or isolation materials by foaming, defibration*, rolling or centrifugation as flux material for the construction industry.

(*breaking into fibers)

METAL

The molten iron contained in the cast is alloyed with heavy metal. It is tapped individually and can be used for further processing in the steel and foundry industry.

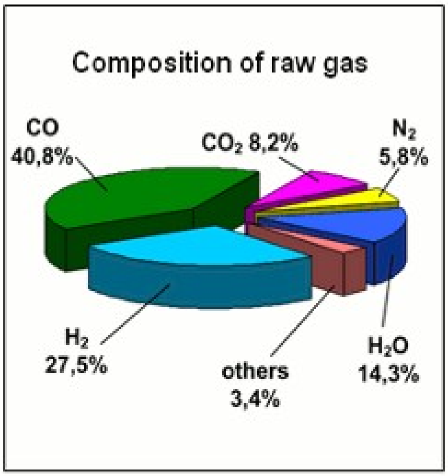
GAS

The gas produced in the reduction zone of the AEP gasification furnace is called raw gas. It is fed into the gas treatment and cleaning system. This gas is almost free from hydrocarbons. Chlorine, sulphur, other unwanted compounds and dust components are separated out by the gas treatment and cleaning process.

These residues also contain sublimates of the low-melting heavy metals. Such residues are further reduced by multiple circulating with the input material and discharged from the process depending on their concentration. Also the filter dust is added to this circulation process several times.

Gas Cleaning

Design of the gas cleaning equipment depends on the use of the gas (see below). Each plant is bespoke designed according to customer needs and conditions.



Raw gas (the gas before cleaning) has a high calorific value of about 2.0 to 3.0 kWh/Nm³

GAS UTILIZATION

- Electricity generation and heat by a steam turbine
- Electricity generation and heat by Combined Heat and Power Units or gas turbines
- Methanol, gasoline & diesel generation
- Supply of clean gas to an external user
- HYDROGEN to external facilities

Efficiency

G COR Above Competition

The previous figure demonstrates the need to maintain a respectable feed CV in order to give a reasonable electrical efficiency. MSW (=Common Municipal Waste) has a CV (=Calorific Value) of 9 - 11 Mj/Kg. When using MSW the Plasma gasifier efficiency is so low and if other parasitic electrical loads are considered, it is likely that the plant will not be electrically self-supporting, i.e. 0% efficiency. For the G COR, the higher the CV of the feed, the greater is the efficiency advantage over an incinerator, air blown and plasma assisted gasifier. Further, well managed use of internal heat will increase net efficiency by at least 10% above that shown on the previous page.

G COR Modularity

The G COR modular plant size presents a better opportunity to use the waste heat arising from the engines etc., for supply to an ad- joining energy user. This combined heat and power installation further improves the process efficiency. As the CV ratio rises, AEP has superior qualities in generating higher energy yields over incinerators / air blown and plasma assisted gasifiers. With 80% renewables content, anaerobic process is recommendable but up to approx. CV 38 Kj.

Mixing all Waste Types and Calorific Values

Low CV waste can be mixed with higher CV compositions (or with added coke or coal. thus achieving a viable CV range. The opposite is also true. High CV value (e.g. car tires) can be mixed with lower CV waste types. Together with processing mixed waste materials which require no shredding or pre-sorting, profit targets can be controlled. This illustration compiles the logic and comments within this assessment to indicate how the various technologies best fit into the waste treatment industry.

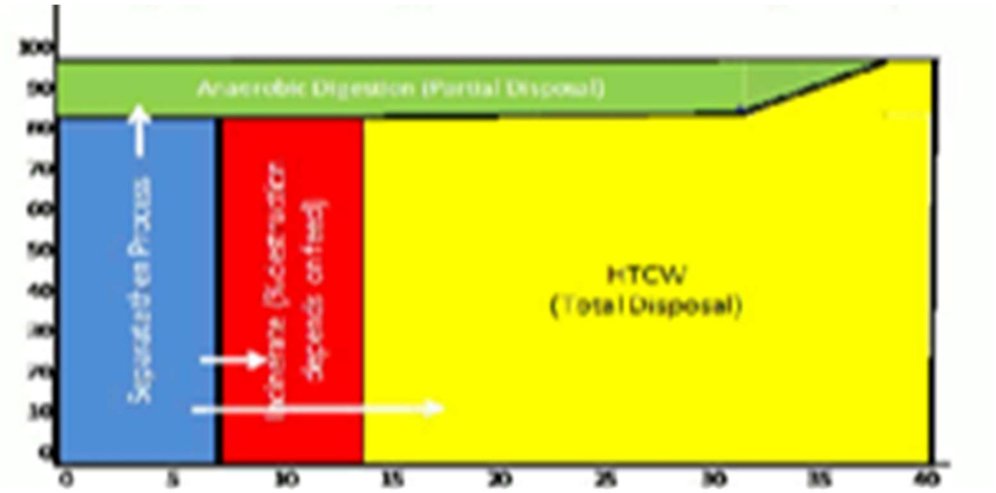
The Alternative Technologies

With qualified independent studies and industry expert advices as source, these illustrations show that G COR gasification encompasses the functionality of the main competing technologies, capable of processing all types of waste in mixed compositions. Concurrently, high and low CV wastes can be combined if needed.

	Technology Options							
Mixed Waste Component	**Compost**	**AD**	**Incinerate**	**Pyrolyse**	**Gasify**	**Landfill**	**Landfill problem**	**HTCW problem**
Paper and card	Yes	No	Yes	Yes	Yes	Yes	OK	none
Plastic film	No	No	Yes	Yes	Yes	Yes	Persistant & Leachate	none
Dense plastic	No	No	Yes	Yes	Yes	Yes	Persistant & Leachate	none
Textiles	No	No	Yes	Yes	Yes	Yes	Persistant	none
Absorbant hygiene products	Yes	some	Yes	Yes	Yes	Yes	Infection	none
Wood	No	No	Yes	Yes	Yes	Yes	Persistant	none
Combustibles	No	No	Yes	Yes	Yes	Yes	Persistant & Leachate	none
Non-combustibles	No	No	Ash	No	Slag	Yes	Persistant	none
Glass	No	No	Ash	No	Slag	Yes	Persistant	none
Organic	Yes	Some	Yes	Yes	Yes	Yes	Odour	none
Ferrous metal	No	No	Ash	No	Yes	Yes	Persistant	none
Non-ferrous metal	No	No	Melts into ash	Melts into ash	Melts into ash	Yes	Persistant	none
Fine material	No	No	Ash	No	Slag	Yes	Persistant	none
Waste Electrical and Electronic	No	No	Yes	Yes but ash	Yes	Yes but not always legal	Persistant & Heavy metals	none
Hazardous Waste Items (including all	No	No	Yes but Temp too low	Yes but ash	Yes	Yes but not always legal	Toxic & Heavy metals	none

APPROPRIATE TECHNOLOGY VS CALORIFIC VALUE AND % RENEWABLE CONTENT

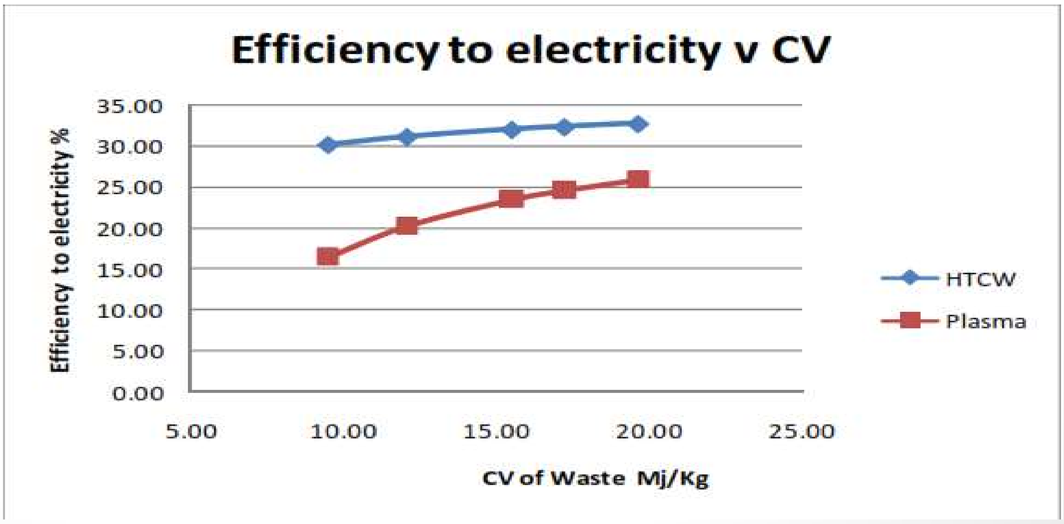
Taken from a qualified independent study, the graph shows that as CV ratio rises, G COR generates higher energy yields than incinerators / air blown gasifiers, including plasma assisted. With 80% renewables content, anaerobic process is recommendable but up to approx. CV 38 Kj.



CALORIFICVALUEMJ/KG
Source: I.P.S. Ltd

EFFICIENCY VS CALORIFIC VALUE

The efficiency of any gasification process is always a function of the CV of the feed. Below is a comparison of the electrical efficiency of an AEP to that of an air blown plasma unit. Good use of G COR internal heat will increase the net electrical efficiency by at least another 10% than shown below. This, together with the illustration on the next page, shows G COR superiority in generating higher energy yields than incinerators / air blown gasifiers, as the CV ratio rises. In this illustration wood is considered as the fuel and the moisture content is altered to vary the CV of the waste. The G COR is operating at 1400C, the oxygen is assumed to have been supplied as liquid. The Plasma operates at 1050C and the plasma torch power is 0.4 MWh/t of feed.



Efficiency Standard

G COR efficiency is measured by: Overall Net Process Efficiency % = 100 x Total Electrical Power Generated - Electrical Power Consumed By Entire Process (MW) + Total Heat Sold To Customers(MW). This divided by: Total Energy In All Feeds (MW)

The engine and generator, together with the heat recovery plant, are in fact conventional equipment. The engines need to be adjusted to suit the syngas. The AEP produced syngas has a calorific value normally greater than 9 Mj/M3, almost twice that of an air blown gasifier. The improved CV and the tar-free nature of the gas allow improved combustion and, arguably, lower wear and tear on the engine generator equipment, compared to syngas formed by air blown gasifiers.

Input Data:
Feed Material, Additional Material and Operational Material The following data are calculated on a certain mix of input material (waste) and will vary with each different mix of input material

Feed Material (Waste)	Additional Material			Operational Material		
	Coke [t/a]	Limestone [t/a]	Cast Iron [t/a]	Oxygen [t/a]	Water [t/a]	Natural Gas [t/a]
10,000 t/a	900	1,200	500	5,800	800	100
20,000 t/a	1,800	2,400	1,000	11,600	1,600	200
30,000 t/a	2,700	3,600	1,500	17,400	2,400	300
40,000 t/a	3,600	4,800	2,000	23,200	3,200	400
50,000 t/a	4,500	6,000	2,500	29,000	4,000	500
60,000 t/a	5,400	7,200	3,000	34,800	4,800	600
70,000 t/a	6,300	8,400	3,500	40,600	5,600	700
80,000 t/a	7,200	9,600	4,000	46,400	6,400	800
90,000 t/a	8,100	10,800	4,500	52,200	7,200	900
100,000 t/a	9,000	12,000	5,000	58,000	8,000	1,000
150,000 t/a	13,500	18,000	7,500	87,000	12,000	1,500
200,000 t/a	18,000	24,000	10,000	116,000	16,000	2,000
300,000 t/a	27,000	36,000	15,000	174,000	24,000	3,000

Further necessary operational materials as various chemicals (caustic soda, hydrogen peroxide, sulphuric acid, activated carbon) or air are not listed here

Output Data

Products and Residues

Feed Material (Waste)	Produkte: Pure Gas [t/a]	Metal [t/a]	Slag [t/a]	Ammonium Sulphate [t/a]	Residues: Dusts [t/a]	Salts/Sludge [t/a]
10,000 t/a	15,500	1,350	1,850	100	450	1.000/50
20,000 t/a	31,000	2,700	3,700	200	900	2.000/100
30,000 t/a	46,500	4,050	5,550	300	1,350	3.000/150
40,000 t/a	62,000	5,400	7,400	400	1,800	4.000/200
50,000 t/a	77,500	6,750	9,250	500	2,250	5.000/250
60,000 t/a	93,000	8,100	11,100	600	2,700	6.000/300
70,000 t/a	108,500	9,450	12,950	700	3,150	7.000/350
80,000 t/a	124,000	10,800	14,800	800	3,600	8.000/400
90,000 t/a	139,500	12,150	16,650	900	4,050	9.000/450
100,000 t/a	155,000	13,500	18,500	1,000	4,500	10.000/500
150,000 t/a	232,500	20,250	27,750	1,500	6,750	15.000/750
200,000 t/a	310,000	27,000	37,000	2,000	9,000	20.000/1.000
300,000 t/a	465,000	40,500	55,500	3,000	13,500	30.000/1.500

Amount of Heat from Cooling Systems

Feed Material (Waste)	Reactor Cooling Systems: Reactor 90/70 °C [MWh/a]	Tapping 40/30 °C [MWh/a]	Gas Cleaning Cooling Systems: Raw Gas 250/200 °C [MWh/a]	Dust 40/30 °C [MWh/a]	Wet stage 35/25 °C [MWh/a]
10,000 t/a	2,400	1,700	5,250	330	1,700
20,000 t/a	4,800	3,400	10,500	660	3,400
30,000 t/a	7,200	5,100	15,740	990	5,100
40,000 t/a	9,600	6,800	20,990	1,320	6,800
50,000 t/a	12,000	8,500	26,240	1,650	8,500
60,000 t/a	14,390	10,190	31,490	1,980	10,190
70,000 t/a	16,790	11,890	36,740	2,310	11,890
80,000 t/a	19,190	13,590	41,980	2,640	13,590
90,000 t/a	21,590	15,290	47,230	2,970	15,290
100,000 t/a	23,990	16,990	52,480	3,300	16,990
150,000 t/a	35,990	25,490	78,720	4,950	25,490
200,000 t/a	47,980	33,980	104,960	6,600	33,980
300,000 t/a	71,970	50,970	157,440	9,900	50,970

PURE GAS UTILIZATION

Substantial use of the Pure Gas

By CHPP

Feed-Material (Waste)	Waste Heat 90/70°C [MWh/a]	E-Energy [MWh/a]
10,000 t/a	25,600	16,300
20,000 t/a	51,100	32,600
30,000 t/a	76,700	48,900
40,000 t/a	102,300	65,100
50,000 t/a	127,900	81,400
60,000 t/a	153,400	97,600
70,000 t/a	179,000	114,000
80,000 t/a	204,600	130,200
90,000 t/a	230,200	146,500
100,000 t/a	255,800	162,800
150,000 t/a	383,700	244,100
200,000 t/a	511,500	325,500
300,000 t/a	767,200	488,200

by Heat Recovery Boiler/Steam Turbine

Feed-Material (Waste)	Waste Heat 40/30°C [MWh/a]	E-Energie [MWh/a]
10,000 t/a	27,900	12,100
20,000 t/a	55,800	24,200
30,000 t/a	83,700	36,300
40,000 t/a	111,600	48,400
50,000 t/a	139,500	60,500
60,000 t/a	167,400	72,500
70,000 t/a	195,300	84,600
80,000 t/a	223,200	96,700
90,000 t/a	251,100	108,800
100,000 t/a	279,000	120,900
150,000 t/a	418,500	181,400
200,000 t/a	558,000	241,800
300,000 t/a	837,000	362,700

PRODUCTION OF ELECTRICAL- AND HEAT ENERGY

You can linear interpolate the data given in these tables in case you need the information for other quantities of feed material. The total amount of feed material (waste) should ideally be a multiple of 20,000 t/a

Direct use by external user

Feed-Material (Waste)	Burning-Heat Pure Gas [MWh/a]
10,000 t/a	46,500
20,000 t/a	93,000
30,000 t/a	139,500
40,000 t/a	186,000
50,000 t/a	232,500
60,000 t/a	279,000
70,000 t/a	325,500
80,000 t/a	372,000
90,000 t/a	418,500
100,000 t/a	465,000
150,000 t/a	697,500
200,000 t/a	930,000
300,000 t/a	1,395,000

Methanol synthesis

Feed-Material (Waste)	Amount of Methanol [t/a]
10,000 t/a	4,250
20,000 t/a	8,500
30,000 t/a	12,750
40,000 t/a	17,000
50,000 t/a	21,250
60,000 t/a	25,500
70,000 t/a	29,750
80,000 t/a	34,000
90,000 t/a	38,250
100,000 t/a	42,500
150,000 t/a	63,750
200,000 t/a	85,000
300,000 t/a	127,500

PRODUCTION OF DRINKING WATER BY SEA WATER DESALINATION

Precondition: stepped distillation
Heat sources: Reactor cooling Raw gas cooling Heat via generation of electrical energy

Feed material (Waste)	HTCW-plants with CHPP		HTCW-plants with boiler and steam turbine	
	Minimum [m³/a]	Maximum [m³/a]	Minimum [m³/a]	Maximum [m³/a]
10,000 t/a	27,650	276,500	29,600	296,000
20,000 t/a	55,300	553,000	59,200	592,000
30,000 t/a	82,950	829,500	88,800	888,000
40,000 t/a	110,850	1,108,500	118,600	1,186,000
50,000 t/a	138,500	1,385,000	148,200	1,482,000
60,000 t/a	188,150	1,881,500	201,300	2,013,000
70,000 t/a	193,800	1,938,000	207,400	2,074,000
80,000 t/a	221,450	2,214,500	236,900	2,369,000
90,000 t/a	249,100	2,491,000	266,500	2,665,000
100,000 t/a	277,000	2,770,000	296,400	2,964,000
150,000 t/a	415,250	4,152,500	444,300	4,443,000
200,000 t/a	553,700	5,537,000	592,400	5,924,000
300,000 t/a	830,700	8,307,000	888,800	8,888,000

Diesel

Feed-	Total Liters	Barrel
Material	per	per
(Waste)	Year	Year
		1 B=160Ltr.
10.000 t/a	3.800.000,00	23.750
20.000 t/a	7.600.000,00	47.500
30.000 t/a	11.400.000,00	71.250
40.000 t/a	15.200.000,00	95.000
50.000 t/a	19.000.000,00	118.750
60.000 t/a	22.800.000,00	142.500
70.000 t/a	26.600.000,00	166.250

G COR FROM PLASTIC TO HYDROGEN

A WAY TO HELP THE ENVIRONMENT GET CLEN AGAIN, PRODUCE CLEAN GREEN HYDROGEN FOR FUTURE GENERATION.

The unique G COR will demonstrate, the distinctive position of our business case to produce low-cost GREEN Hydrogen energy for a cleaner and better future for everyone. This technology will be part of the solution of two pending problems humanity wants to see dealt with a soon a s possible:

Reasonable disposal of daily growing worldwide Plastic Waste problem and the production of affordable zero-emission energy –

GREEN HYDROGEN.

We are in the lucky position to be holder of a technology that solves these problems with one technology like no company before us. Our business model is conversion of mixed Plastic Waste (and other waste products) into low-cost Green Hydrogen gas, the energy source of the future, via High Temperature Gasification, in short named G COR.

Hydrogen is the simplest and most abundant element in earth and the universe. It is light, storable, energy-dense, and produces no direct emission of pollutants or greenhouse gases.

Unlike solar and wind, it can be used any time on the day, no matter what weather conditions.

The G COR technology allows to process wastes like plastic and anything from tyers, medical supplies, wood and virtually other waste (except nuclear waste), and through a thermochemical process, called gasification (High temperature Gasification), converts it into a gas, form which it then extracts Hydrogen and other valuable substances.

An example:

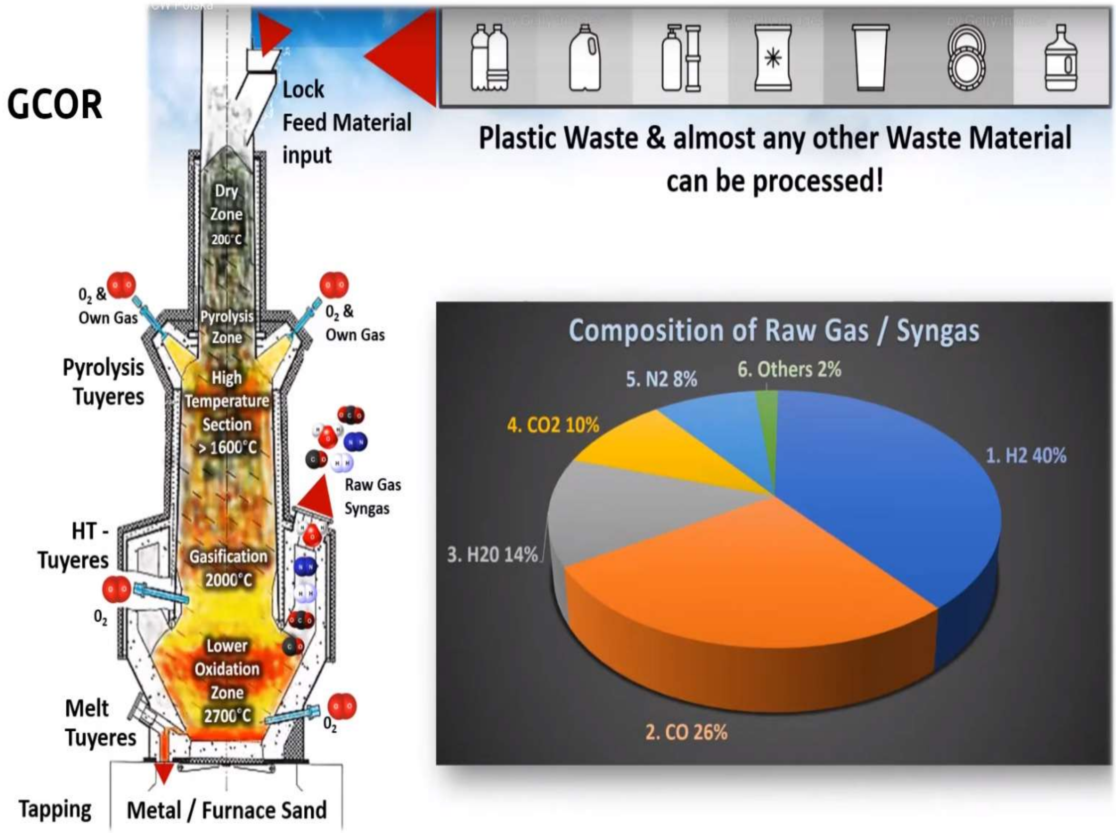
Out of **100'000 Metric Tons** of non-recyclable and unsortable mixed Plastic Waste more than **20'000 Metric Tons** of low-cost Hydrogen is created.

WASTE TO HYDROGEN HAS BECOME REALITY WITH G COR TECHNOLOGY!

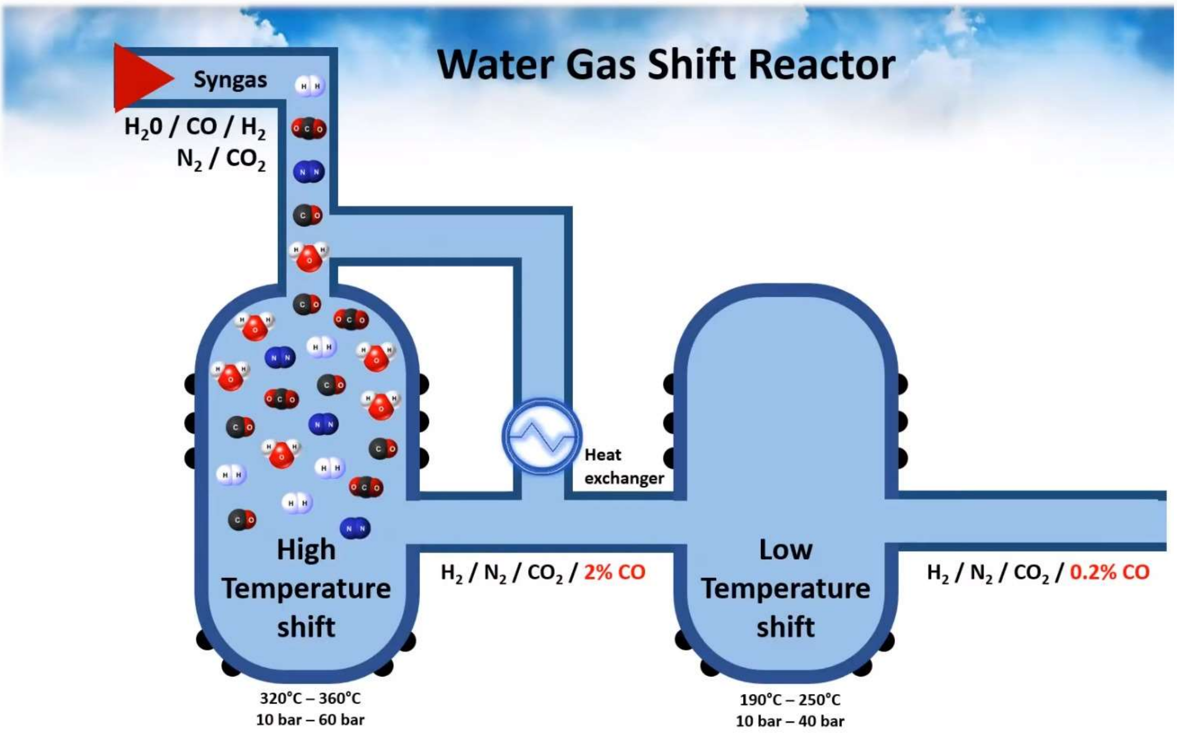
DEVELOPING A GREEN HYDROGEN ZERO-EMISSION SOCIETY CAN BEGIN TODAY!

How G COR Produces Hydrogen

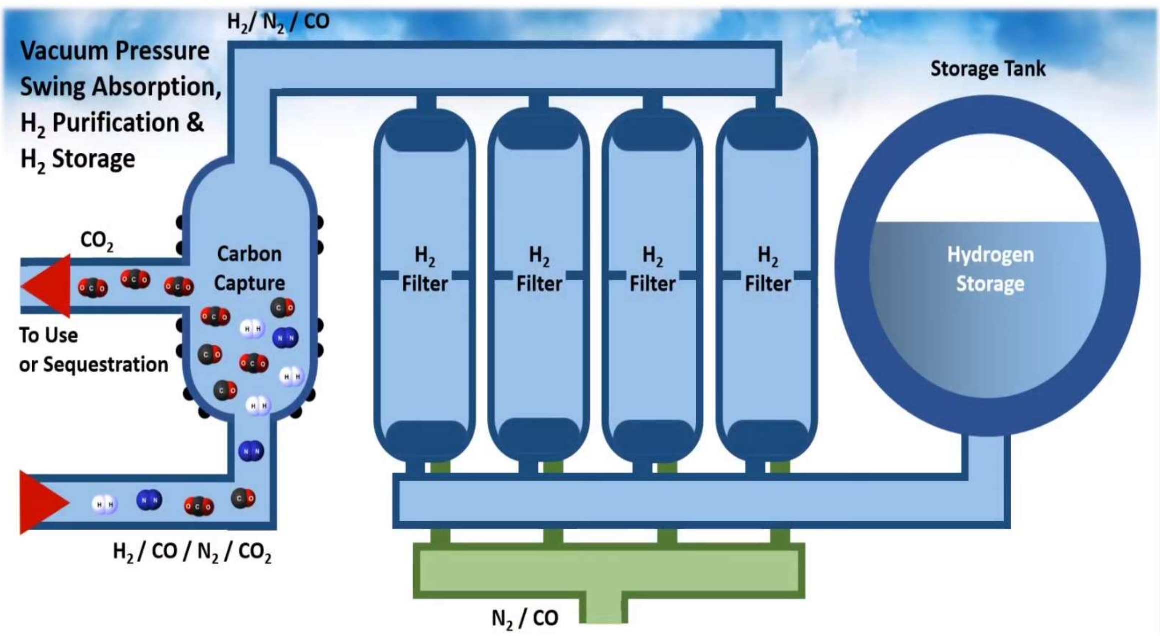
STAGE 1: Plastic and or other Material goes trough the System producing Syngas, Meta and Mineral Slag



STAGE 2: Syngas goes through the Water Gas Shift Reactor

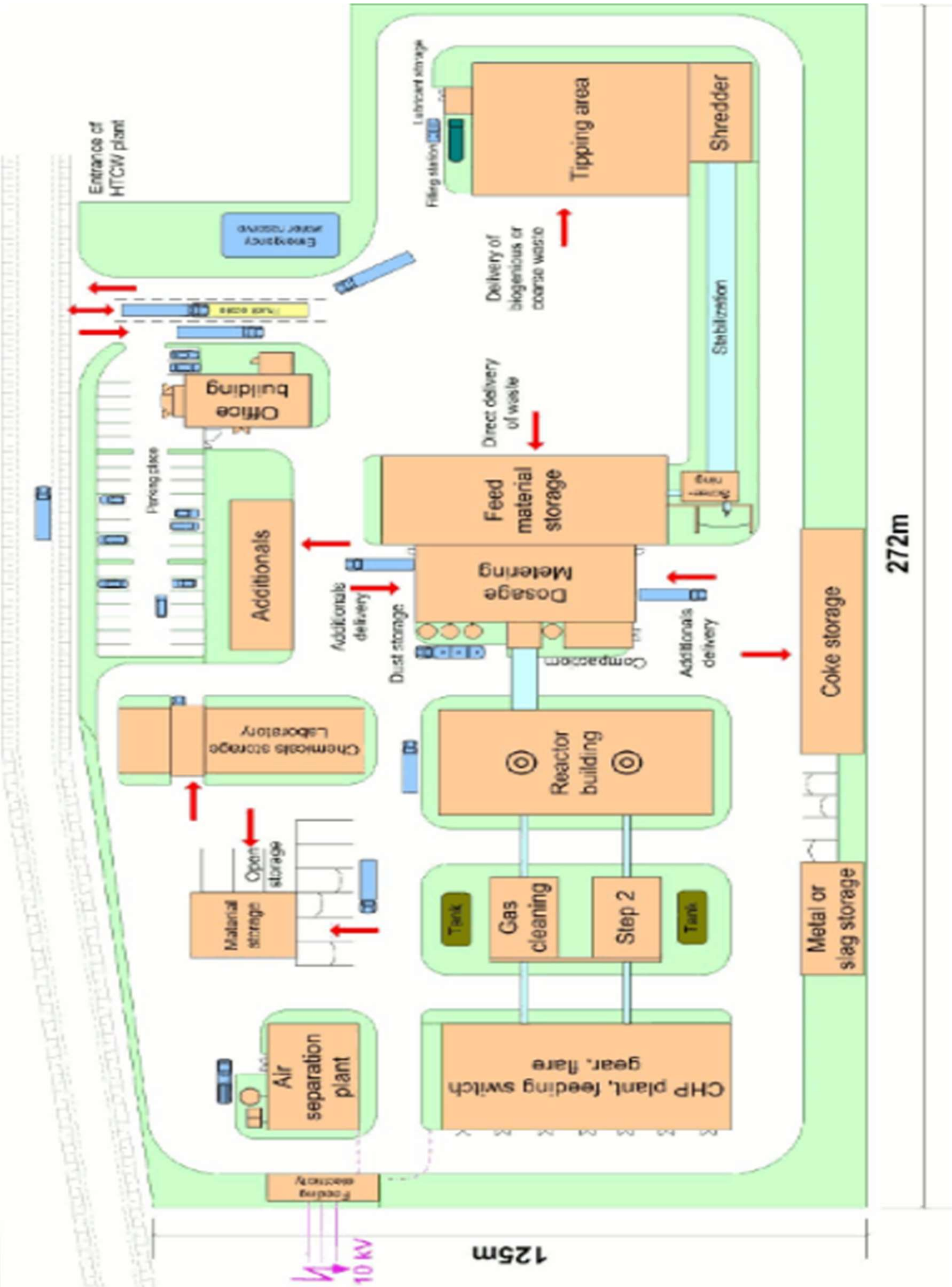


STAGE 3: Then passes on to the Vacuum Pressure Swing Absorption, H2 Purification and finally to H2 Storage



Plant Design

Conceptual Site Plan of a 20 - 30,000 t/a G COR Plant



G COR Green Conversion of Refuse (High Temperature Gasification)

High Temperature Gasification; name for their process that uses an oxygen blown Cupola for waste treatment/ management.

CV Calorific Value

Calorific value a measure of how much energy or heat is available from a unit weight of a material. Normally expressed in:

Joules/ gram = Kj/Kg = Mj/Te

Alternatively:

Mj/Kg = Kj/Kg divided by 1000.

CHP Combined Heat and Power

This describes an energy process where electricity is generated and the waste heat from the associated engines is supplied for other beneficial use. A conventional system does not do this but loses the waste heat usually through the engine radiator and via the exhaust. A CHP system collects and exports this heat and so offsets the need to use fuels for a boiler to raise the heat. The plant is awarded efficiency for the electricity, normally around 35% and more for the heat recovered and used. On well integrated systems a combined efficiency for the CHP alone in excess of 80% is attainable.

MW Megawatt

MW h Megawatt hour

MSW Municipal Solid Waste

PCB Polychlorierte Biphenyle

are a class of organic compounds with 1 to 10 chlorine atoms attached to biphenyl, which is a molecule composed of two benzene rings.