



HARNESSING WEALTH FROM WASTE – EXPLORING A SYSTEMS APPROACH FOR WASTE TO ENERGY – THE CONCORD BLUE SYSTEM

ABOUT US

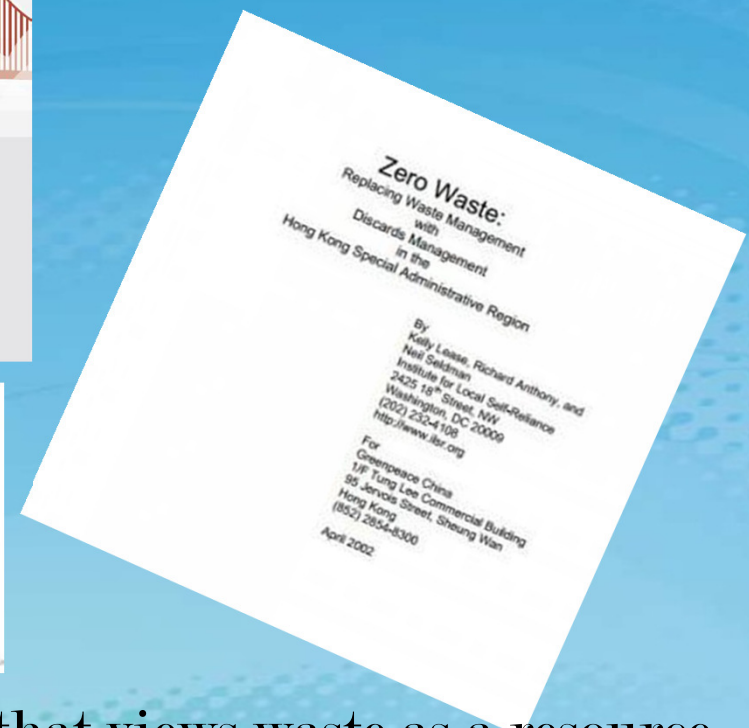
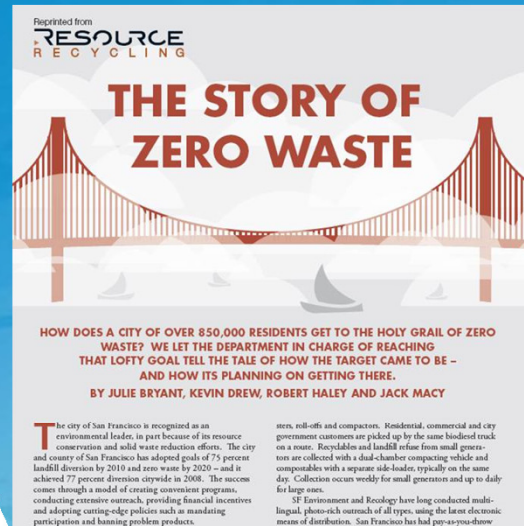
**TECHNOLOGY
DETAILS**

AGENDA

**THE WAY FORWARD
– MSW TO
ETHANOL STORY**

**PUNE – WASTE TO
ENERGY**

WASTE – A Resource for Energy



This concept calls for a paradigm shift that views waste as a resource with sustainable end usage by remoulding its components and utilizing the same for profitable venture(s), thereby resulting the integrated set of activities into a commercially viable business model.

**FOCUSED ON FINDING
SUSTAINABLE
SOLUTIONS FOR ALL
STAKEHOLDERS IN THE
SOCIETY**



THE CONCORD ENVIRO GROUP



**MEMBRANE &
WASTE WATER DIV.**



**SOLID WASTE TO
ENERGY**



**SEWAGE
TREATMENT**

**ROCHEM
GREEN
ENERGY**

R.G.E.

**Invest in W2E on
EPC/PPP basis**

A DIVERSIFIED WASTE MANAGEMENT GROUP

A comprehensive waste solution firm, the Concord Enviro group delivers (patented) non-incineration based environmentally friendly, economically viable, turnkey waste to energy solutions on an EPC, BOOT/DBOOT/DBFOT/BOT/SIMILAR VARIANTS.

As the official manufacturer and contractor for the Concord Blue Reformer, Concord Blue holds the exclusive license for the construction and operation of the carbon neutral waste to energy technology.

CES TOPLINE FOR FY 13 – USD 50 MILLION

EXPECTED TOPLINE FOR FY 14 – USD 65 MILLION

CURRENT INVESTMENTS IN WASTE TO ENERGY PROJECTS – USD 25 MILLION

OFFICES AROUND THE GLOBE IN MUMBAI, MEXICO, DUBAI, LOS ANGELES, DUSSELDORF

CUSTOMERS & PARTNERSHIPS

MUNICIPALITIES OF THE FOLLOWING CITIES

- **PUNE**
- **AURANGABAD**
- **CHENNAI**
- **SURAT**
- **VADODARA**
- **MALDA**
- **COLOMBO**
- **JABALPUR**
- **SIKAR**

INFRASTRUCTURE COMPANIES

- **ESSEL INFRA**
- **AAPL INFRA**
- **TECHNOCRAFT ASSOCIATES**

TECHNOLOGY PROVIDERS

- **GOODEARTH POWER (FOR AFRICA)**
- **LOCKHEED MARTIN ENGINEERING COMPANY (FOR NORTH AMERICA)**
- **LANZATECH USA**

Resource Stewardship

Biologists

Environmental
Engineers

Economists

Civil Engineers

Mechanical
Engineers

Architects

- Natural Resources
- Human Resources
- Financial Resources

Ceramic Engineers

Transportation

Planners

Designers

Community Leaders

Business
Leaders

Production Engineers

Chemical Engineers

THE TEAM

PRAYAS GOEL

- GROUP HEAD

PRERAK GOEL

- DIRECTOR – FINANCE

DR. H.J. MUHLEN

- TECHNOLOGY HEAD – CONCORD BLUE

CHARLIE THANNHAUSER

- CEO – CONCORD BLUE

Mr. VIVEK TONDAPURKAR

- CEO - RGE

Dr. HEINZ JORGEN MUHLEN

Physicist

Inventor for the Blue Tower Technology & holder of several patents for gasification

Technology Collaborator for the Concord Blue Technology

Has worked for over 30 years in the field of gasification with the German Government

Expert in the field of coal and biomass gasification



The Concord Blue Technology

- The Concord Blue System is a patented, non-incineration based Gasification technology offered by Concord Blue Technology Pvt. Ltd.
- The company is a part of the Concord Enviro Group and has exclusive rights to manufacture and market the technology globally.
- Currently, the company has completed commissioning of over 10 MWth. Concord Blue Towers within India, and is engaged in the construction of over 50 MWth. Concord Blue Towers globally.

CONCORD BLUE TECH. OVERVIEW

- Two Stage Non-Incineration based Self Perpetuating process
- Feed heated in absence of O_2 to effect a thermal phase change from solid to gas
- Produced Gas is reformed in secondary chamber to eliminate pollutants and for H_2 enrichment
- Reformed clean syngas is processed in a gas engine for power generation
- Minimal land requirement
- Byproduct – Bottom ash – can be used in cement factories (RMC plants)



CONCORD BLUE TECHNOLOGY

- **Part of the CONCORD ENVIRO Group - A global enterprise** with over 20 years in Wastewater & Waste recycling & over 300 satisfied clients in 7 countries, for varied waste & waste water recycling needs.
- World-wide patented (filed) staged reforming waste disposal technology:
CONCORD BLUE TOWER™
- The only global Concord Blue Tower general contractor and manufacturer.
- German-Indian Engineering & Manufacturing company with offices in UAE, India, USA, Germany & Turkey
- Currently building over **10 Concord Blue Towers** in India, Germany and the USA.
- We develop turn key waste-to-energy solutions for municipalities, private industries, states and even countries.
- Focus on Waste to Energy with **non conventional Feedstock**



Concord Blue – History

1. **2007** – Technology Transfer with DM2 Germany, company with operating plants on Japan & German since 2004.
2. **2007-2008** – Joint Technology Development between Indian & German Partners led to development of CBR2 patented Gasification system for low CV MSW streams.
3. **2011** – Over 10,000 hours Pilot operation on various waste streams, process validation & fine tuning. 3 CBR2 pilots supplied & commissioned in Las Vegas (USA, in process), Herten (Germany) and Mumbai (India).
4. **2012** – Commissioned two Concord Blue towers of cumulative 10 MWth. capacity



Concord Blue – TECHNOLOGY EVOLUTION



Proven Technology

5 YEARS OF
TECHNOLOGY
DEVELOPMENT
AND PILOT
PROJECTS

HERTEN,
GERMANY

VASAI, INDIA

DEMONSTRATION
PROJECTS
GERMANY
INDIA
UNITED STATES

PROJECTS PLANNED AND
CONSTRUCTION UNDERWAY

GERMANY

INDIA

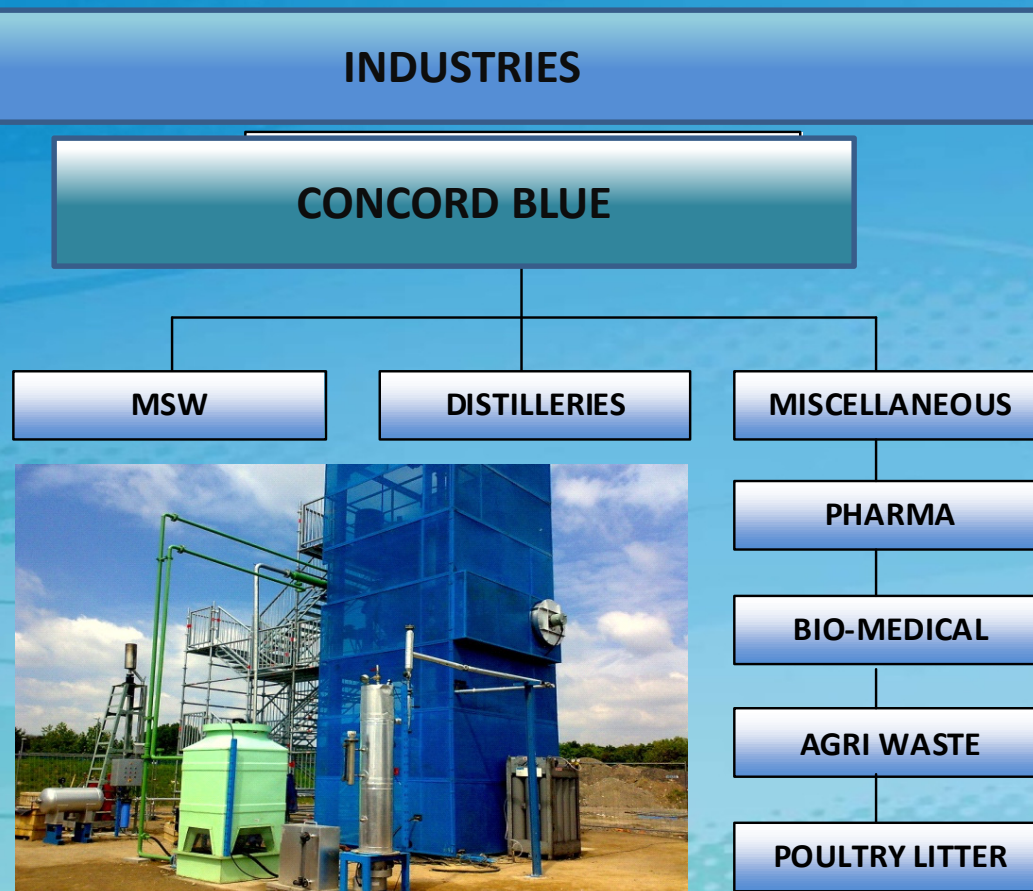
U.S.A

MEXICO

INDONESIA

LATAM

SOME OF THE INDUSTRIES WE CATER TO



MSW PROJECTS WITH CONCORD BLUE TECHNOLOGY UNDER EXECUTION



Our Process Matters

Work Streams





**THE
SOLUTION**

TECHNOLOGY

PROPOSITION

MIXED MSW - COMPONENTS

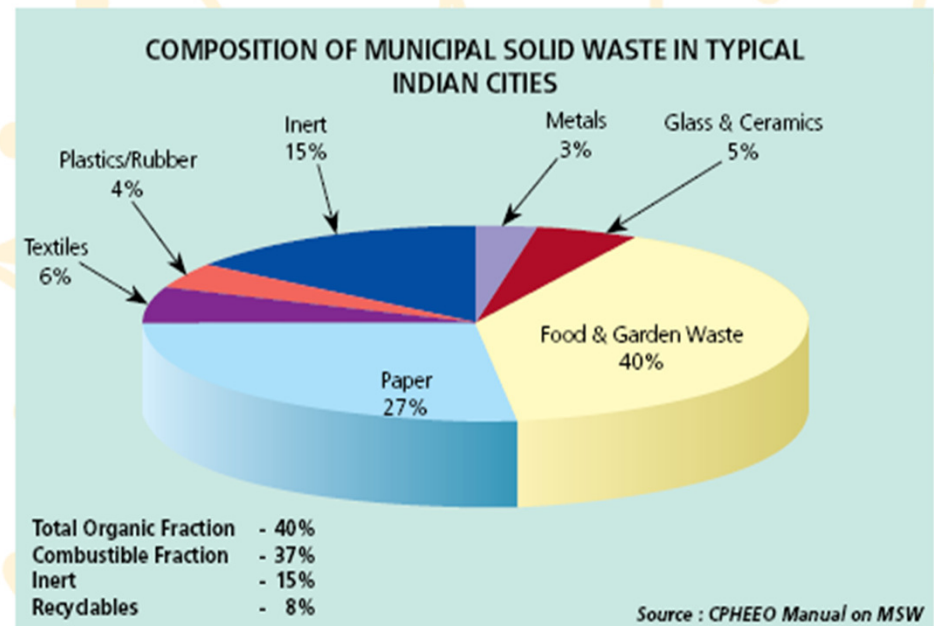
Predominantly an extremely heterogeneous ensemble of components sporting high moisture, high ash and low CV

Organic 60%, Recyclables 15 %, Others 25%

- Vegetable 4.2 %,
- Paper 2.5%,
- rubber/plastics 2.9%,
- Wood 2.3%,
- Bone 1.1%,
- Textiles 2.4 %,
- Metals 0.9%,
- Glass 0.5%,
- combustible leaves 15.1%,
- Non-combustible stone 2.5%,
- All fine 65%



MIXED MSW IN INDIA – AN ILLUSTRATION



MIXED MSW – sample analysis



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AN ISO 9001:2008 CERTIFIED ORGANISATION

FOUNDER
Late Dr. Homi R. Nanji
Ph.D., B.Pharm (London)
F.R.L.C., F.R.S.A.,

BRANCHES:
Chennai, Kolkata, Bellary, Vizag,
Jamnagar,
Sample Not Given

Corp. Off.: Pharmed House, 3rd Floor, 4th, Macarand Hirachand Marg, Fort, Mumbai - 400 001.
Tel.: 022 2261 2364 4353 2362 Fax: 2261 2362 e-mail: italabinspection@gmail.com
Regd. Off.: Meher House, 15, Cawasji Patel Street, Fort, Mumbai - 400 001.
Tel.: 022 2287 3882 2287 3667 2287 2545 2202 2515 4333 3888 Fax: 022 2287 4888
e-mail: italabmum@mtbl.net.in / italabmum@gmail.com Web: www.italab.com

CERTIFICATE OF ANALYSIS

No. PC/P3/11254

1. PARTICULARS OF SAMPLE SUBMITTED :

- Name of the Party: **M/s. Concord Blue Technology Pvt.Ltd., Thane 401208.**
- Nature of Sample: **M.S.W. (PMC - 01)**
- Reference No.: **CBT/HJ 4.1/2010-11/014 Lt.Dt.20.01.2011**
- Date of Receipt: **21.01.11 P-3**
- Quantity: **Abt. 300 gms**
- Packing: **MN.52333**

2. RESULTS OF ANALYSIS

Free Moisture (As it is)	...	...	39.47 %
PROXIMATE ANALYSIS			
Moisture	...	...	8.02%
Ash	...	...	31.33%
Volatile Matter	...	...	54.22%
Fixed Carbon (by difference)	...	...	6.43%
ULTIMATE ANALYSIS			
Moisture	...	...	8.02%
Mineral matter	...	...	34.46%
Carbon	...	...	48.27%
Hydrogen	...	...	4.44%
Nitrogen	...	...	0.60%
Sulphur	...	...	0.31%
Oxygen (By difference)	...	...	3.90%
Gross Calorific Value (Dry Basis)	...	...	3351 Cal/gm 6032 Btu/lb
As Received Basis	...	...	1693 Cal/gm 3047 Btu/lb

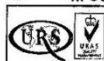
Test carried out by:

Date:

Mrs. Serika

31.01.2011

ASSOCIATES: Italab (Goa) Pvt Ltd Goa 1500, Vasco da Gama, Vasco da Gama, Vasco da Gama



All work is carried out to the best of our ability, however, we do not accept any responsibility for our report and without affecting it, we are the authorized signatory of our report is limited to the test samples identified herein. This report is strictly confidential and its use is for the purpose of the test only.



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e-mail: italabmum@mtbl.net.in / italabmum@gmail.com Web: www.italab.com

CERTIFICATE OF ANALYSIS

No. PC/P3/11254

PARTICULARS OF SAMPLE SUBMITTED :

- Name of the Party: **M/s. Concord Blue Technology Pvt.Ltd., Thane 401208.**
- Nature of Sample: **M.S.W. (PMC - 02)**
- Reference No.: **CBT/HJ 4.1/2010-11/014 Lt.Dt.20.01.2011**
- Date of Receipt: **21.01.11 P-4**
- Quantity: **Abt. 300 gms**
- Packing: **MN.52333**

RESULTS OF ANALYSIS

Free Moisture (As it is)	...	...	40.95 %
PROXIMATE ANALYSIS			
Moisture	...	...	0.16%
Ash	...	...	21.03%
Volatile Matter	...	...	65.05%
Fixed Carbon (by difference)	...	...	13.76%
ULTIMATE ANALYSIS			
Moisture	...	...	0.16%
Mineral matter	...	...	23.13%
Carbon	...	...	69.70%
Hydrogen	...	...	6.26%
Nitrogen	...	...	0.45%
Sulphur	...	...	0.30%
Oxygen (By difference)	...	...	0.11%
Gross Calorific Value (Dry Basis)	...	...	4846 Cal/gm 7318 Btu/lb
As Received Basis	...	...	Sample does not get fired

Test carried out by:

Date:

Mrs. Serika

31.01.2011

ASSOCIATES: Italab (Goa) Pvt Ltd Goa 1500, Vasco da Gama, Vasco da Gama, Vasco da Gama



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Key points for mixed MSW

Landfills

Municipal Waste Disposal

- Cost of landfill operation
- Growing footprints
- Methane & CO₂ emissions
- Water quality issues
- Odor
- Artificial habitat sink
- Negative views

MIXED MSW

CHARACTERISTICS

- HIGH MOISTURE CONTENT, HENCE LOW CALORIFIC VALUE
- VERY LOW RECYCLABLES CONTENT

CHALLENGES

- TOTAL SOLUTION NEEDED TO TREAT ALL STREAMS OF WASTE IN MSW viz. BIODEGRADABLES AND NON-BIODEGRADABLES
- NEED TO FREE PRIME REAL ESTATE ON WHICH MSW IS DUMPED
- HAS TO BE EFFECTIVE IN ALL SEASONS
- ABILITY TO TREAT VARIABLE WASTE QUALITY
- TAILOR MADE FRONT END SOLUTION NEEDED
- INCINERATION ON STAND ALONE BASIS NOT FEASIBLE

TECHNOLOGY COMPARISON

FEATURES	Composting	Landfill	Incineration	Gasification* – Waste to Energy
Emissions to Atmosphere	Low	Median	High	Negligible
Recovery of Energy	Low	Nil	Low	High
Suitability for various kinds of wastes	Low	N/A	Low	High
Rejects back to Landfill	High (> 60%)	N/A	Low	Low (<10%)
Seasonal Variation	High	N/A	Low	Low
Land Area for MSW disposal	Very high	Very High	Median	Low
Smell emitted	High	High	Median	Low (as system is completely covered)
Processing Time	High (> 30 days)	N/A	Low	Low (Waste gets disposed off in the same day)
Construction Time	High	Very High	Low	Low

Framework for Integrated Approach for W2E Solution



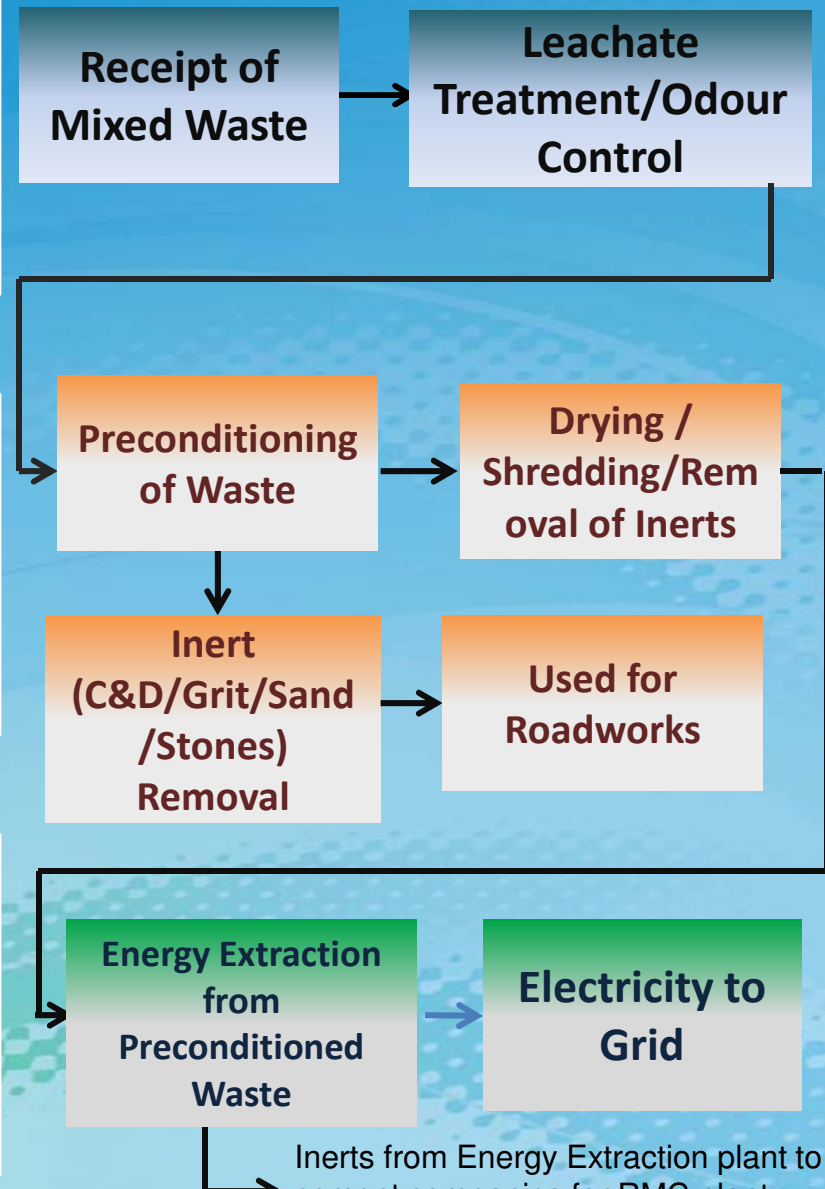
Receipt of Waste with minimal Storage, with no odour and zero leachate discharge



Efficient pre-conditioning of waste to extract recyclables and convert mixed waste into an usable fuel



Convert Pre-Conditioned waste to Energy in an Environmentally friendly manner



RECEIPT OF WASTE

The philosophy of zero waste management commences at the waste receipt design.

The facility ought to be designed to store the minimum quantum of waste. In other words, the waste received on a day, should be disposed off on the same day.

This ensures minimal land requirement for waste storage, thereby saving valuable real estate for commercially beneficial purpose for the government.

The facility for waste receipt ought to be sealed to ensure no odour leaks out, and it should be chemically de-odorized to ensure that minimal smell pervades the atmosphere within.

The waste storage bays ought to have a zero leachate management system by collecting the leachate from freshly delivered MSW and disposing it by suitable means like recycling through an R.O system and extracting the permeate (the rejects from the R.O can be used for energy extraction)



Membrane based R.O plant for

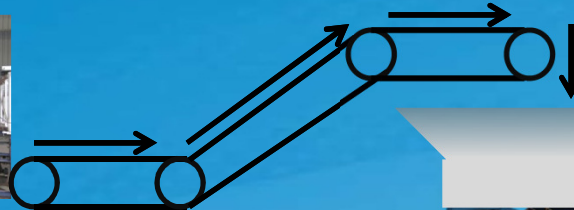
PRECONDITIONING OF SOLID WASTE



Waste picked up by front loaders/overhead grab cranes



Conveyed to Primary Shredder to improve flowability



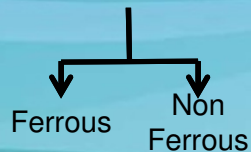
Dried Waste for Inert and Metal Removal

Primary Shredded waste conveyed to a drier for initial moisture removal (Drier to utilize waste heat from energy producing device to ensure no fossil fuel is burnt for providing heat of evaporation)



Secondary Shredder

Recyclables Recovery



Pre-conditioned waste for energy generation

Oversized fraction from Trommel Screen



Rotary trommel for size based separation

Lighter fraction separated by pneumatic suction



Undersized heavies removed in screen separators – Inerts comprising of grit, sand, stones, C&D

PURPOSE OF PRECONDITIONING OF SOLID WASTE



→
INTO



↑
**To
convert**

**A Usable fuel for
power generation**

IMAGES OF PRE-CONDITIONING SYSTEM OF SOLID WASTE



SEG/SORT



DRYER



SHREDDER

ENERGY EXTRACTION FROM PRE-CONDITIONED WASTE

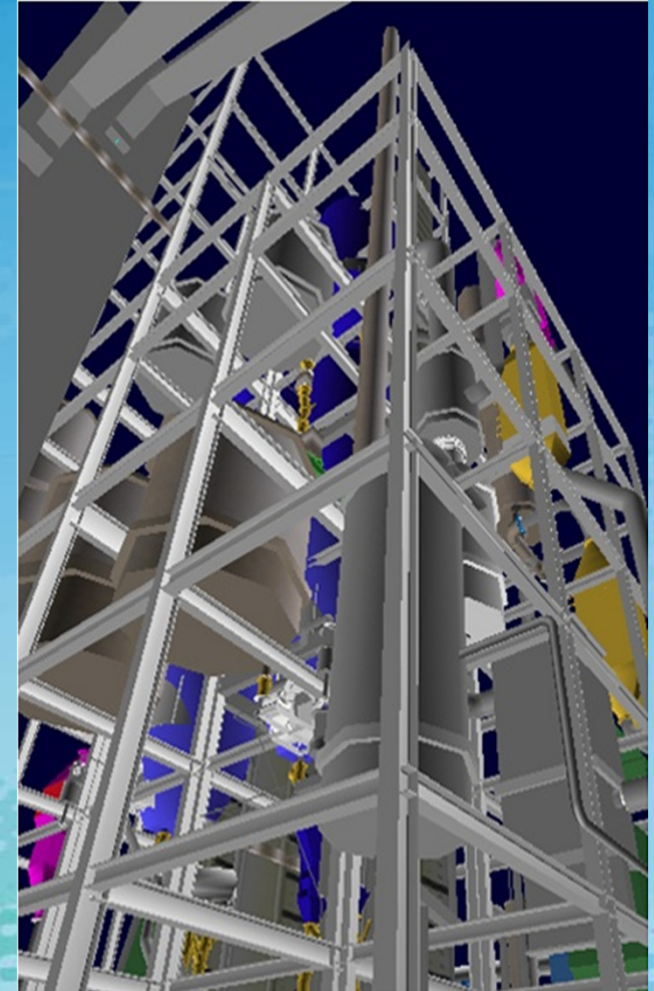


WHAT IS GASIFICATION

1. Non Incineration Thermal Waste to Energy Solution
2. Thermal Phase Change from Solid to Gas Phase in complete absence of Oxygen
3. Produces as SYNGAS FUEL ! This can be used to Generate electricity.

WHY IS GASIFICATION FEASIBLE ?

1. Since it uses the Gas Cycle to convert fuel to Electric.
2. High efficiency (proven) Reciprocating Gas Engines are used, as against lower efficiency Medium pressure Steam Turbines
3. Thermodynamically superior to steam cycle
3. Waste Heat is used efficiently to Create a viable feed-stock from MSW.
4. Since non-incineration it is safe to use plastics, which augment feed CV.



WHY IS GASIFICATION SUITABLE FOR DISPOSAL OF MIXED SOLID WASTE

➔ NO OPEN DUMPING OF WASTE – HENCE NO INGRESS OF VECTORS FOR SPREAD OF DISEASES

➔ COMPLETELY SEALED STORAGE UNIT – NO SMELL; COMPLETE LEACHATE CONTROL BY ROCHEM'S R.O SYSTEM

➔ SEGREGATION INVOLVES REMOVAL OF METALS, GLASS AND INERTS –MUCH SIMPLER THAN SORTING OF BIODEGRADABLES FROM NON-BIODEGRADABLES

➔ NO OXIDATION/BURNING OF WASTE – NO AIR POLLUTION; ONLY PHASE CHANGE FROM SOLID TO GAS; SAFE DISPOSAL OF PLASTICS INCLUDING PVC

➔ CLEAN GREEN HYDROGEN RICH GAS FROM WASTE FOR POWER PRODUCTION

➔ LEAST AMOUNT OF SPACE REQUIRED FOR SYSTEM

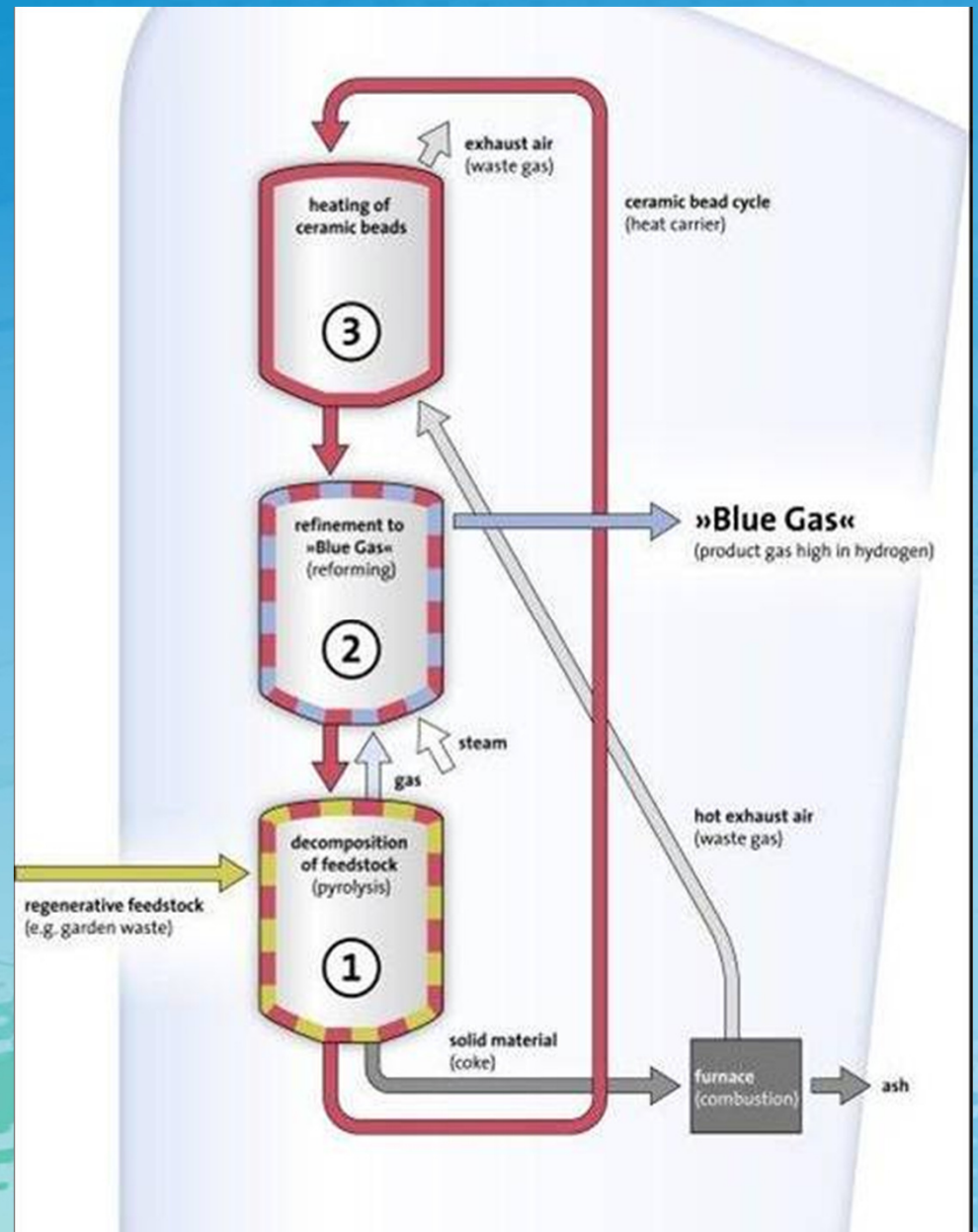
➔ MINIMAL/NO REJECTS TO LANDFILL – INCREASES ITS LIFE



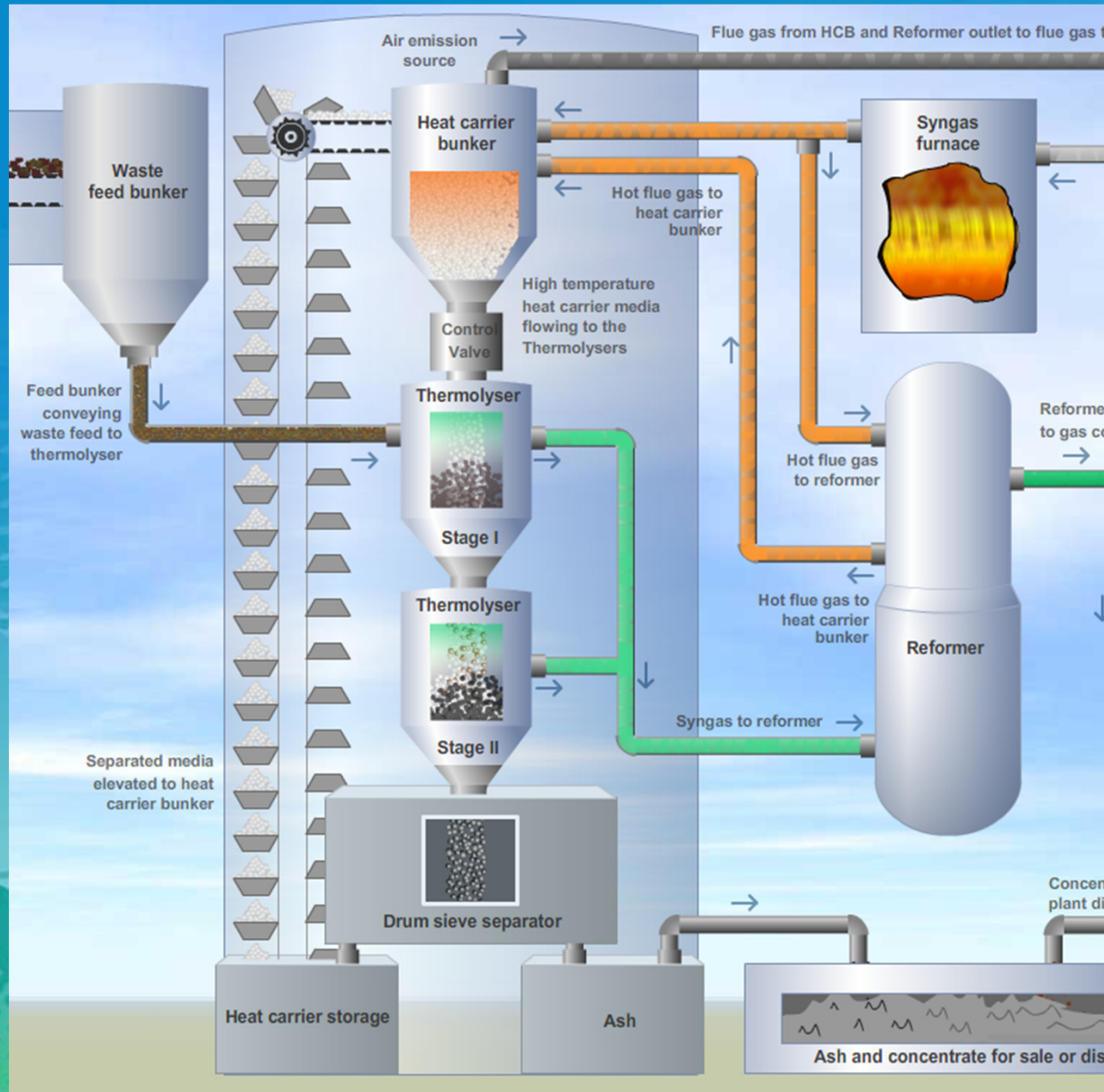
THE CONCORD BLUE TECHNOLOGY

PROCESS:

- Staged Reforming: 3 spatially separated vessels.
- Fully Automated
- Waste material is segregated (only for Inert) & dried.
- Waste material is fed into Pyrolyser to decompose input to 80% gas & 20% char. (Up to 50% char production is possible if preferred)



PROCESS OF GASIFICATION



- Two Stage Non-Incineration based process
- Self Perpetuating Process
- Feed heated in absence of O_2 to effect a thermal phase change from solid to gas
- Produced Gas is reformed in secondary chamber to eliminate pollutants and for H_2 enrichment
- Reformed clean syngas is processed in a gas engine for power generation
- Minimal land requirement
- Byproduct – Bottom ash – can be used in cement factories (RMC plants)

THE CONCORD BLUE REFORMER – A BETTER SOLUTION



Concord Blue Reformer

**ZERO
COMBUSTION**

MINIMAL SPACE

**ZERO LIQUID
DISCHARGE**

**CLEAN
EMISSIONS**

BASIS OF DESIGN FOR GASIFICATION PROCESS for unsegregated MSW – AN ILLUSTRATION

SUMMARY OF COMPONENT ANALYSIS OF MSW

Sr. No.	Type	AREA I		AREA II		AREA III		AREA IV		AVERAGE	
		Wt. (kgs.)	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
1	Kitchen Waste	17	0.43	45	1.79	80	2.14	29	1.50	42.75	1.41
2	Green Matter	1956	49.75	1246	49.4	2120	56.68	1108	57.13	1607.5	53.00
3	Coconut Shell/Straw/Hay/Stalk Dab	19	0.48	28	1.1	17	0.45	20	1.03	21	0.69
4	Wooden Pieces	16	0.41	19	0.8	36	0.96	16	0.82	21.75	0.72
5	Paper/Cardboard	59	1.50	109	4.3	215	5.75	68	3.51	112.75	3.72
6	Textile/Cotton	127	3.23	147	5.8	176	4.71	139	7.17	147.25	4.86
7	Rubber and Leather	9	0.23	52	2.1	25	0.67	27	1.39	28.25	0.93
8	Plastic Bag	181	4.60	217	8.6	182	4.87	146	7.53	181.5	5.98
9	Metals	3	0.08	3	0.1	8	0.21	1	0.05	3.75	0.12
10	Glass	8	0.20	7	0.3	18	0.48	4	0.21	9.25	0.30
11	Sand/Soil/Earth	546	13.89	465	18.5	192	5.13	166	8.56	342.25	11.28
12	Stones/Brick/Concrete	612	15.56	142	5.6	322	8.61	189	9.74	316.25	10.43
13	Ceramic and Other	6	0.15	7	0.3	9	0.24	2	0.10	6	0.20
14	Dead Animal/Raw Meat	4	0.10	9	0.4	4	0.11	---	---	4.25	0.14
15	Batteries	0.5	0.01	---	---	---	---	0.5	0.03	0.25	0.01
16	PVC	21	0.53	19	0.8	25	0.67	22	1.13	21.75	0.72
17	Haz Waste	2.5	0.06	2	0.1	4	0.11	---	---	2.125	0.07
18	Thermocol	2	0.05	3	0.1	4	0.11	2	0.10	2.75	0.09
19	Human Hair	1	0.03	---	---	16	0.43	---	---	4.25	0.14
20	Innert (muddy type)	342	8.70	---	---	287	7.67	---	---	157.25	5.18
	Total	3932.0		2520		3740		1939.5		3032.9	

SUMMARY OF HEAT AND MASS BALANCE FOR (PROPOSED) GASIFICATION PROCESS for a 1000 tpd unsegregated MSW

PRECONDITIONING			GASIFICATION			POWER GENERATION		
INPUT	TPD	1000	INPUT TO GASIFIER	tph	25	Energy of gas in Engine	MWth.	46.48
MOISTURE	TPD	450				Engine Efficiency	%	38
Inerts	tpd	160	CV OF INPUT WASTE TO GASIFIER	KCAL/KG	2460	Power Out	Mwgross	17.7
Inert Removal	tpd	144	Feed per hour to Gasifier	tph	25.00			
Waste sans Inerts	tpd	856	Input Energy to CB	Mwgross	71.51	Parasitic consumption	Mwinternal	2.50
Moisture removal	tpd	856	Cold Gas Efficiency of Gas Engine	%	65%	Net Sellable power	Mwnetsellable	15.2
Feed to Preconditioning system	tph	50	Energy of Gas made Available for Gas Engine	MWth.	46.48	Waste heat from Gas Engine	Mwwaste	12.97
Moisture removal per hour	tph	17.50	Ash from Char	tpd	105	Total Waste heat available for drying of MSW	Mwwastetotal	20.48
Energy required for removal of moisture	MWth.	17.58	Waste heat from CBS	MWwasteCB	7.51			

Space required – 6-7 Acres

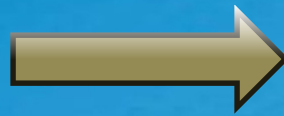
SUMMARY OF HEAT AND MASS BALANCE FOR (PROPOSED) GASIFICATION PROCESS for a 250 tpd unsegregated MSW

PRECONDITIONING STAGE				GASIFICATION STAGE				GAS ENGINE STAGE			
	INPUT	TPD	250		INPUT TO GASIFIER	TPD	128.125		Energy of gas in Engine	MWth.	11.31
	MOISTURE	TPD	112.5		Number of working hours per day	Hrs./day	22		Engine Efficiency	%	38
	Inerts	tpd	35		CV OF INPUT WASTE TO GASIFIER	KCAL/KG	2400		Power Out	Mwgross	4.3
	Inert Removal	tpd	31.5		Feed per hour to Gasifier	tph	6.24				
	Waste sans Inerts	tpd	218.5		Input Energy to CB	Mwgross	17.40		Parasitic consumption	Mwinternal	0.69
	Moisture removal	tpd	90.375		Cold Gas Efficiency of Gas Engine	%	65%		Net Sellable power (PERFORMANCE GUARANTEE	Mwnetsellable	3.6
	Number of working hours per day	Hrs./day	22		Energy of Gas made Available for Gas Engine	MWth.	11.31		Usable Waste heat from Gas Engine	Mwwaste	3.16
	Moisture removal per hour	tph	4.40		Ash from Char	tpd	25.625		Total Waste heat available for drying of MSW	Mwwastetotal	4.98
	Energy required for removal of moisture	MWth.	4.28		Usable Waste heat from CBS	MWwasteCB	1.83				

Space required – 3-4 Acres

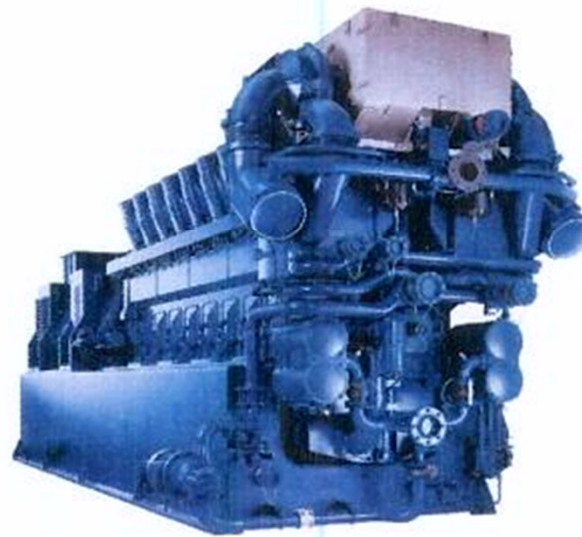
GAS ENGINE MANUFACTURERS

Gas Engine



MWM - Germany

gensets of series TCG 2032 V 16 with accessories and services

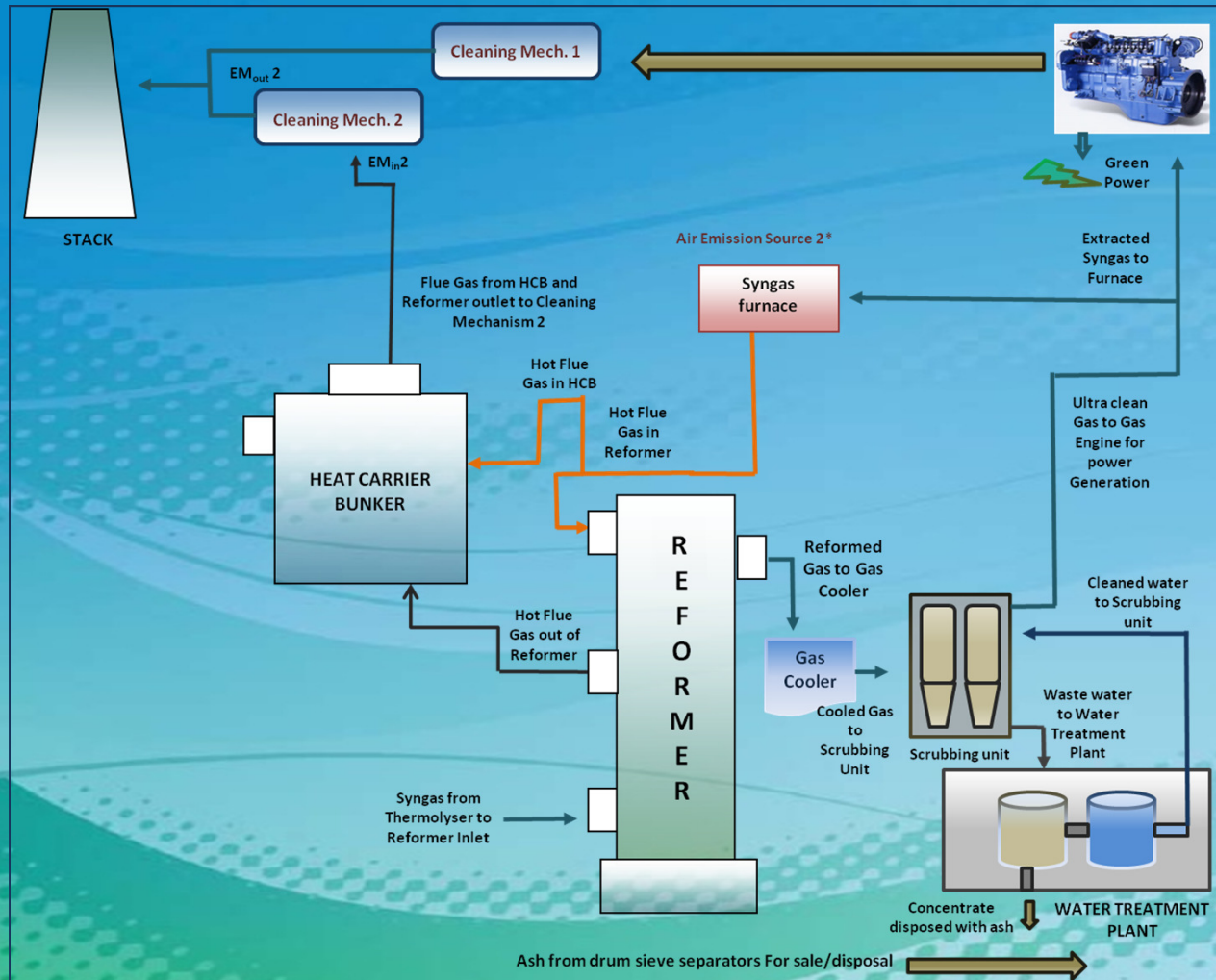


Picture may differ from actual engine

Genset data:

Electric power:	2628 kW (p-f=1,0) *)
Thermal output:	2619 kW *)
Fuel consumption:	6488 kW *)
Fuel:	Synthetic gas *)
Voltage:	11000 V

ENVIRONMENTAL CONCERNS



- The (proposed) gasification process produces an ultra clean gas due to reformation that **does not produce any PoPs**;
- The DIOXINS and FURANS are not formed as the plastic (or any chlorinated) wastes are not burned, but thermo chemically degraded;
- The engine emissions as well as the flue gas from syngas furnace chamber are treated with the state-of-the art control mechanisms like SCRs and Oxidative Catalysts to keep the emissions way below even the most stringent control norms;

EMISSIONS - REPORTS

KULKARNI LABORATORY & QUALITY MANAGEMENT SERVICES
NABL ACCREDITED LABORATORY

Ref. No.

Date :

Ref No : KLQMS/C/468 A	TEST REPORT	Report Date: 08.03.2013
Customer Name & Address: Rochem Green Energy Pvt. Ltd. Final Pl. No. 86, Ramtekdi Industrial Estate, Hadapsar, Pune 411013 Nilesh Ayeer : Sr. Manager - Purchase	Page - 1 of 1 MSW Gasification plant Sample Location: Dryer Chimaney Sample Type: Stack Date of Sampling : 22.02.2013 Time Of Sampling: 16:30	

Source Emission monitoring report

Sr. No.	Parameter	Results	Units
1.	Material of Stack	Carbon steel	--
2.	Stack height from G.L.	30	Mtr
3.	Type of Stack	Round	---
4.	Dimensions of stack	1.02	Mtr.
5.	Stack area	0.865	M ²
6.	Fuel gas temperature	383	^o K
7.	Differential Pressure	1.7	mmWG
8.	Velocity	3.67	M/s
9.	Particulate matter	53.23	mg/Nm ³
10.	Sulphur dioxide	25.54	mg/Nm ³
11.	Nitrogen Oxide	13.02	mg/Nm ³
12.	Carbon Monoxide (CO)	1.02	ppm
13.	Oxygen (O ₂)	BDL	ppm

Standard method used IS:11255

Checked By:



P.H.Kulkarni.

Authorized Signatory

EMISSIONS – Dioxin and Furan

DIOXIN & FURAN

FLARE STACK (2210002602)

Extraction: 20.01.2011

11:00Hrs – 15:20Hrs

- Oxygen content: 11.7(vol-%)
- Moisture: 0.40(vol-%)
- Stack Temperature: 568[°C]
- Extracted volume: 4.582[Nm³n,dry]

Congener	amount (ng)	I-TEF	I-TEQ (ng)
2,3,7,8-TCDF	0.033	0.1	0.0033
2,3,7,8-TCDD	<0.0038	1	<0.0038
1,2,3,7,8-PeCDF	0.041	0.05	0.002
2,3,4,7,8-PeCDF	0.044	0.5	0.022
1,2,3,7,8-PeCDD	<0.0076	0.5	<0.0038
1,2,3,4,7,8-HxCDF	0.034	0.1	0.0034
1,2,3,6,7,8-HxCDF	0.035	0.1	0.0035
2,3,4,6,7,8-HxCDF	0.042	0.1	0.0042
1,2,3,7,8,9-HxCDF	<0.0095	0.1	<0.00095
1,2,3,4,7,8-HxCDD	0.012	0.1	0.0012
1,2,3,6,7,8-HxCDD	0.017	0.1	0.0017
1,2,3,7,8,9-HxCDD	0.015	0.1	0.0015
1,2,3,4,6,7,8-HpCDF	0.15	0.01	0.0015
1,2,3,4,7,8,9-HpCDF	<0.038	0.01	<0.00038
1,2,3,4,6,7,8-HpCDD	0.27	0.01	0.0027
OCDF	<0.19	0.001	<0.00019
OCDD	0.73	0.001	0.00073
TOTAL PCDD/PCDF			0.048-0.057
TOTAL PCDD/PCDF (ng TEQ/Nm ³)			0.012
TOTAL PCDD/PCDF (ng TEQ/Nm ³)	at 10 [%] O ₂ (EMR)		0.01

विज्ञापन सं० डी० एल०-33004/99

REGD. NO. D.L.-33004/99

भारत का राजपत्र The Gazette of India



असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)

PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

सं. 352]
No. 352]

नई दिल्ली, बुधवार, जून 26, 2008/आषाढ़ 5, 1930
NEW DELHI, THURSDAY, JUNE 26, 2008/ASADHA 5, 1930

पर्यावरण और वन मंत्रालय

अधिसूचना

नई दिल्ली, 26 जून, 2008

सा.का.वि. 481(अ).—केन्द्रीय सरकार, पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 6 और 25 के द्वारा प्रस्तुत शक्तियों का प्रयोग करते हुए, पर्यावरण (संरक्षण) नियम, 1986 में और संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात् :—

1. (1) इन नियमों का संक्षिप्त नाम पर्यावरण (संरक्षण) पांचवां संशोधन नियम, 2008 है।

(2) ये सरकारी राजपत्र में उनके प्रकाशन की तारीख को प्रवृत्त होंगे।

2. पर्यावरण (संरक्षण) नियम, 1986 में,—

अनुसूची I में, क्रम संख्या 99 और उससे संबंधित प्रविष्टियों के पश्चात् निम्नलिखित क्रम संख्या और प्रविष्टियाँ अन्तःस्थापित की

जाएँगी, अर्थात् :—

क्रम सं.	उद्योग	पैरामीटर	मानदण्ड
1	2	3	4
“100	साझा खतरनाक अपशिष्ट भस्मीकरण संयंत्र	क. उत्सर्जन	
		जब तक उल्लेखित न हो, संक्षिप्त सीमा मि.ग्र./घन मी. में	जब तक उल्लेखित न हो, प्रयोगित अवधि (मिनट) में
		विश्वकृत पदार्थ	30
		HCl	30
		HF	30
		CO	100
		कुल आर्गेनिक कार्बन	30
		HF	24 घंटे
		नाइट्रोजन के ऑक्साइड (NO और NO ₂ को NO ₂ के रूप में व्यक्त)	30
		कुल डाइऑक्साइड और फुरान्स	0.1 ng/TEQ/Nm ³
		Cd + Th + उनके योगिक	2 घंटे
		पारा और इसके योगिक	2 घंटे
		Sb + As + Pb + Co + Cr + Cu + Mn + Ni + V + उनके योगिक	2 घंटे

ADVANTAGES FROM PROPOSED SOLUTION

Non Incineration

- No combustion of waste; Hence no toxic fumes released or any putrescence (foul smell) experienced;
- Process is completely compliant with existing pollution control standards across geographies;

LOWEST SPACE REQUIREMENT – can be located close to gen.

- The facility needs minimal space for waste management;
- This facility is sufficient for the next 20-30 years for incremental quantum of waste with negligible increase in land requirement

Negligible rejects

- Only negligible rejects in form of ash & inerts for disposal;
- **Rejects quantity will be less than 15% of the total quantum** of waste which can be utilized for beneficial purpose thereby making the Zero Waste Concept a REAL possibility

Effective treatment of plastics

- **Since the process is a non-incineration based tech., plastics, especially PVCs can be processed and disposed without giving rise to carcinogens like dioxins and furans**

No storage or seasonal variations

- The waste gets disposed on the day of receipt itself resulting into no pollution owing to pile up;
- The technology is unaffected by seasonal variations and works at peak efficiencies irrespective of climatic conditions

ADVANTAGES FROM PROPOSED SOLUTION

MULTIPLE WASTE HANDLING CAPABILITY

- The proposed solution can dispose alongside MSW, even industrial oil, bio-medical waste, sewage sludge *et al.*

WASTE CLEARED FROM EXISTING DUMP

- Proposed solution can also process the waste lying in the existing dump. This would gradually clear the area leaving it for other beneficial purpose for the Corporation.

FASTEST TIME TO IMPLEMENT

- Simplicity of process and technical collaborations allow the implementation of the project in the fastest possible time



**IS THIS SOLUTION WORKING
ANYWHERE ON A
COMMERCIAL SCALE?**

THE CONCORD BLUE SYSTEM - PUNE

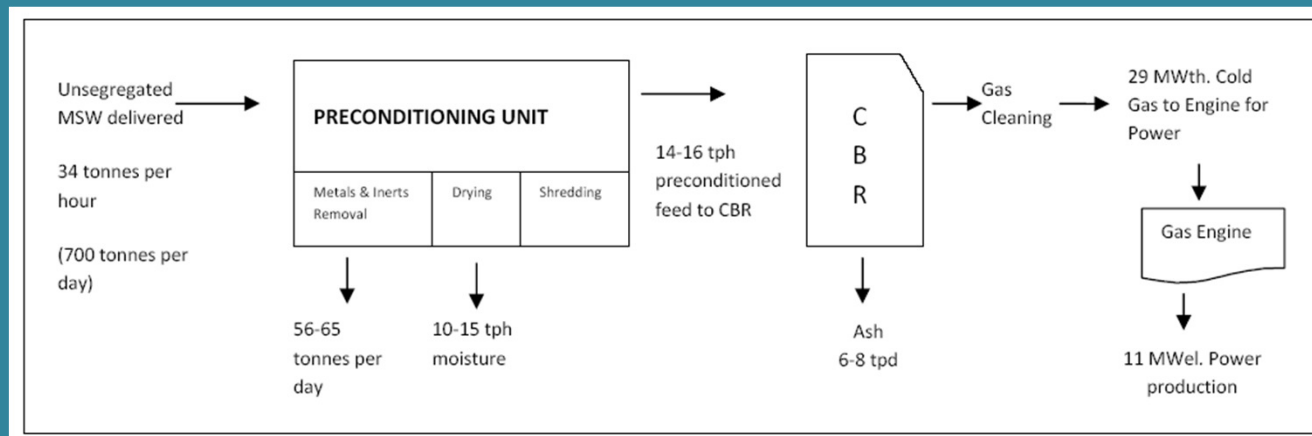


CONCORD BLUE REFORMER - PUNE

The completed HJ4 CBR™ will be the largest of its kind waste to clean energy gasification facility in India. With an input of 700 tpd of fresh, unsegregated low calorific municipal solid waste, the HJ-4 CBR™ is currently accepting 300 TPD of unsegregated waste for its first phase of operations (commercial) and is generating power from therein.

Broad Input / Output

- Input – Unsegregated Municipal Solid Waste – 700 tonnes per day (2,55,500 tonnes per annum);
- Receipt of waste – 365 days a year;
- Plant Uptime (Defined as the amount of time for production of electricity) – 7500 hours/annum;
- Amount of Electricity Produced – 11.0 MWel (Gross electric power);
- Rejects from the system:
 - Inerts & Recyclables - A function of the feed – estimated at APPROX 10% of the received waste
 - Ash - A function of the feed – estimated at APPROX 30-40 TONS/DAY (subject to actual feed analysis)
- Space required - 10,000 square meters;

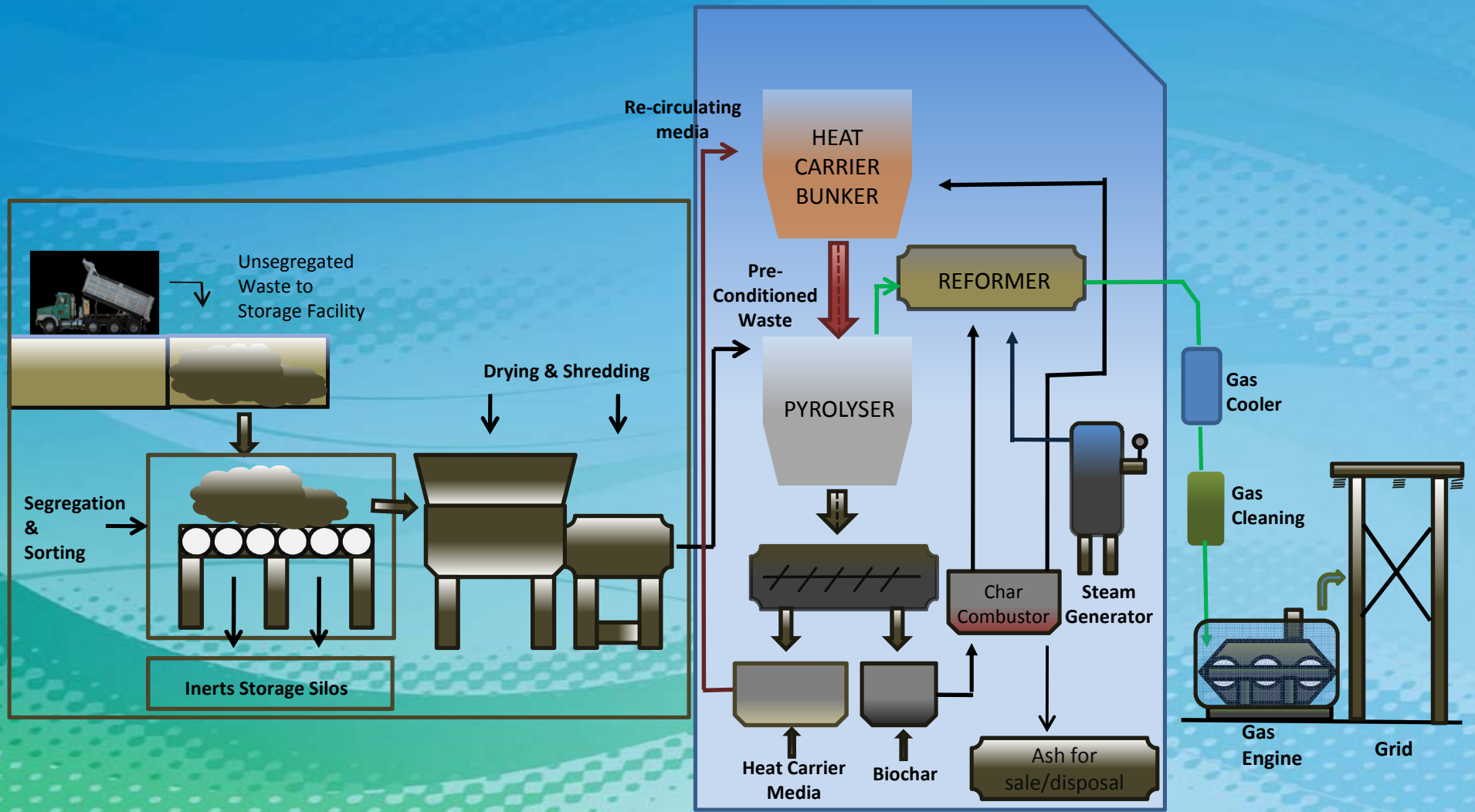


SUMMARY OF INTEGRATED W2E SOLUTION FOR ZERO WASTE

PRECONDITIONING

GASIFICATION

POWER GENERATION

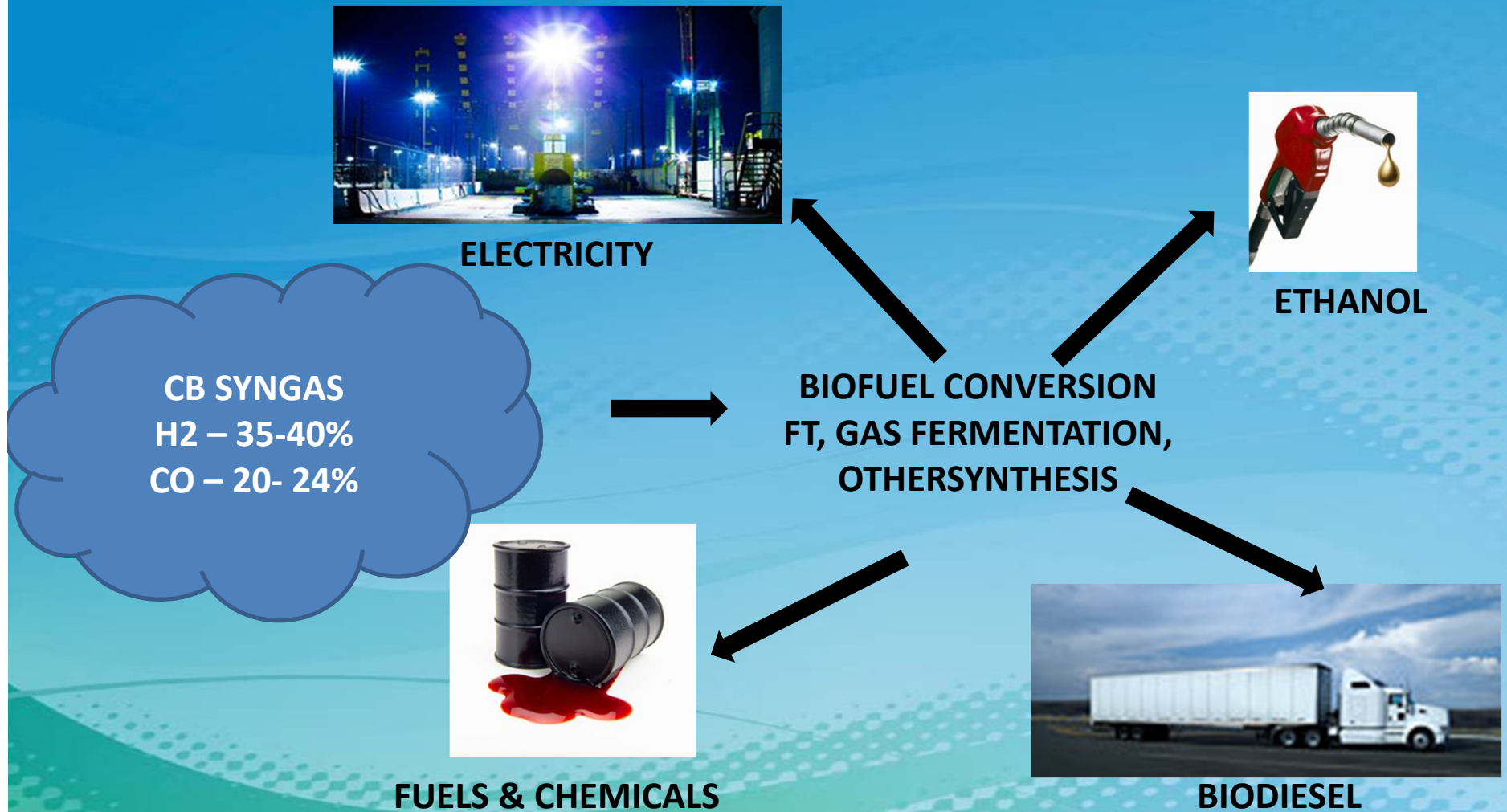


THE WAY FORWARD

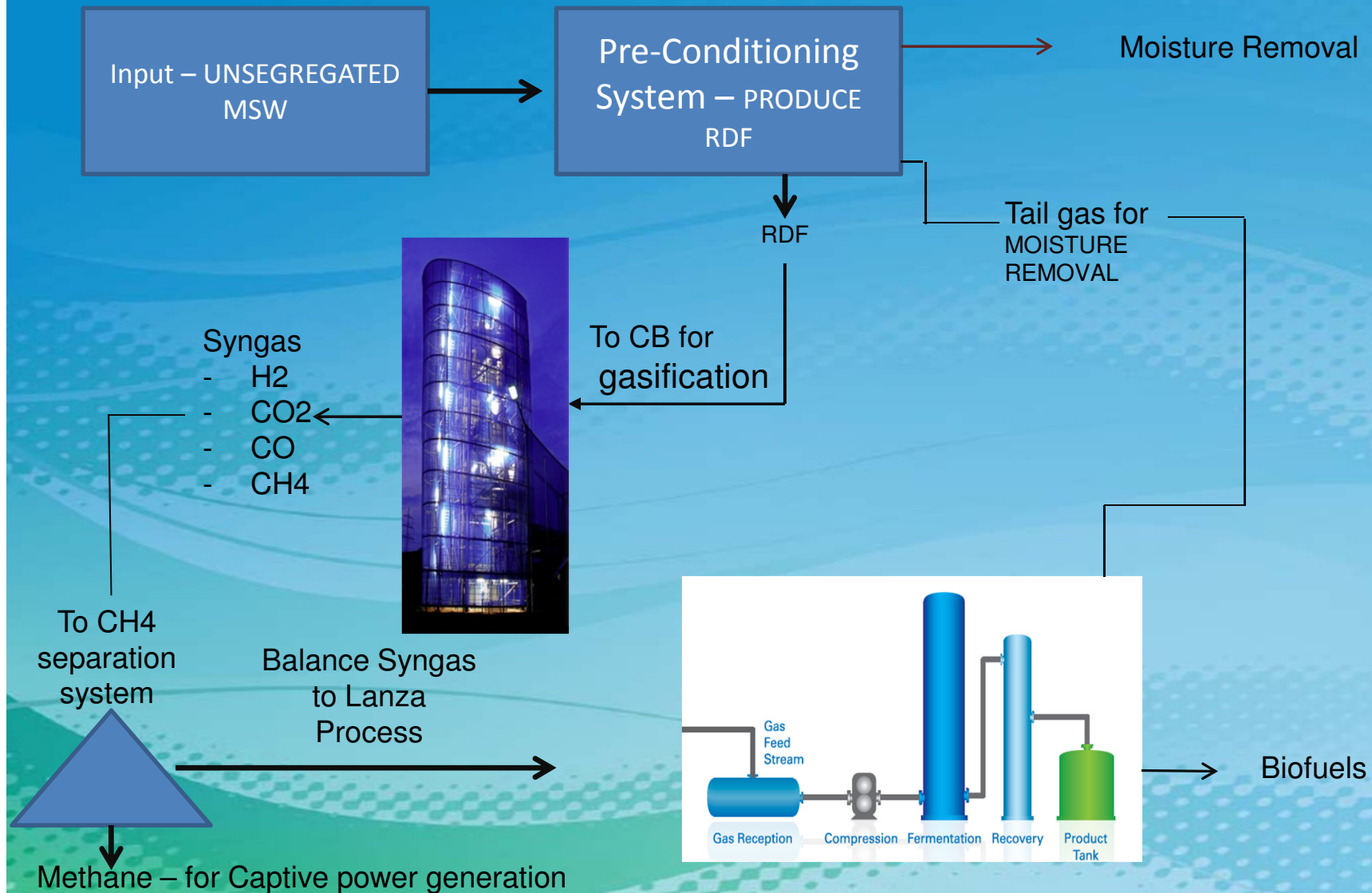


**MSW TO
ETHANOL**

BIOFUELS – FEEDSTOCK ISSUES

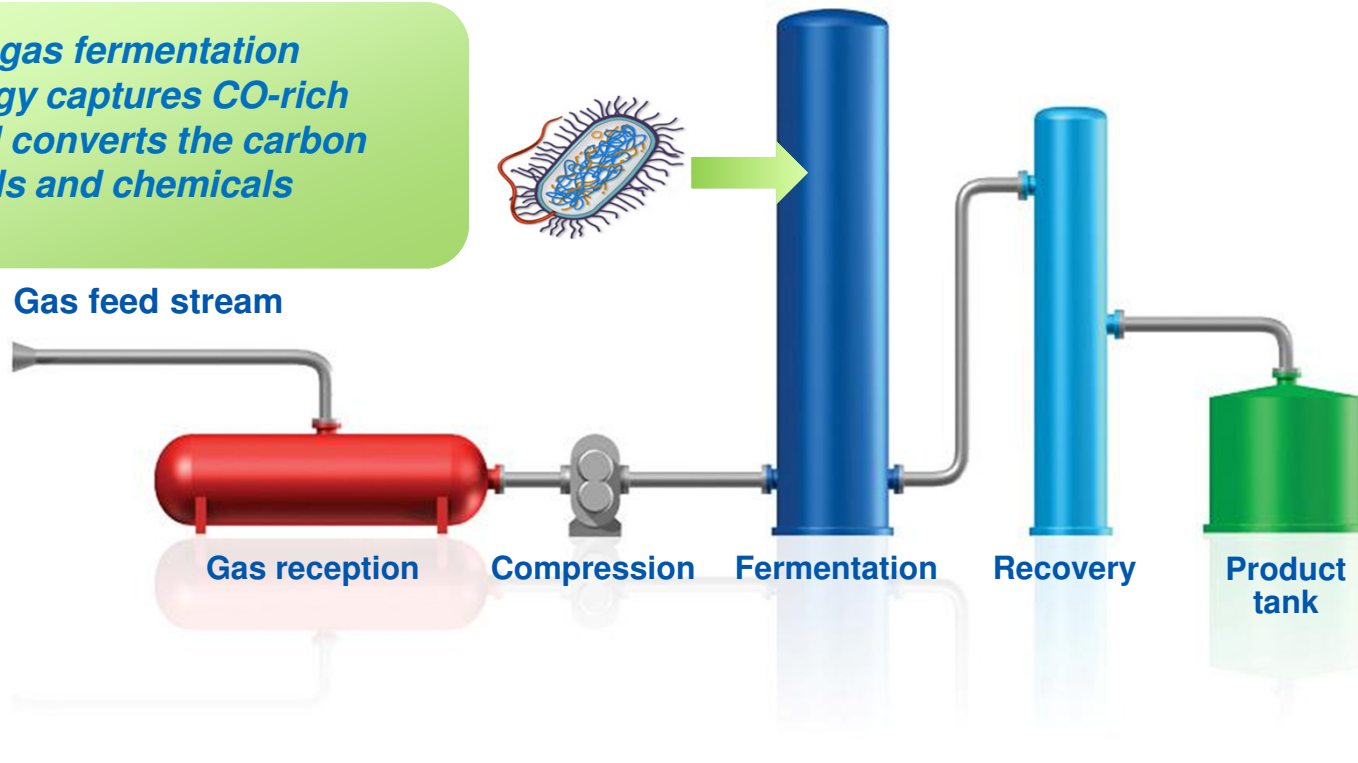


WASTE TO ETHANOL



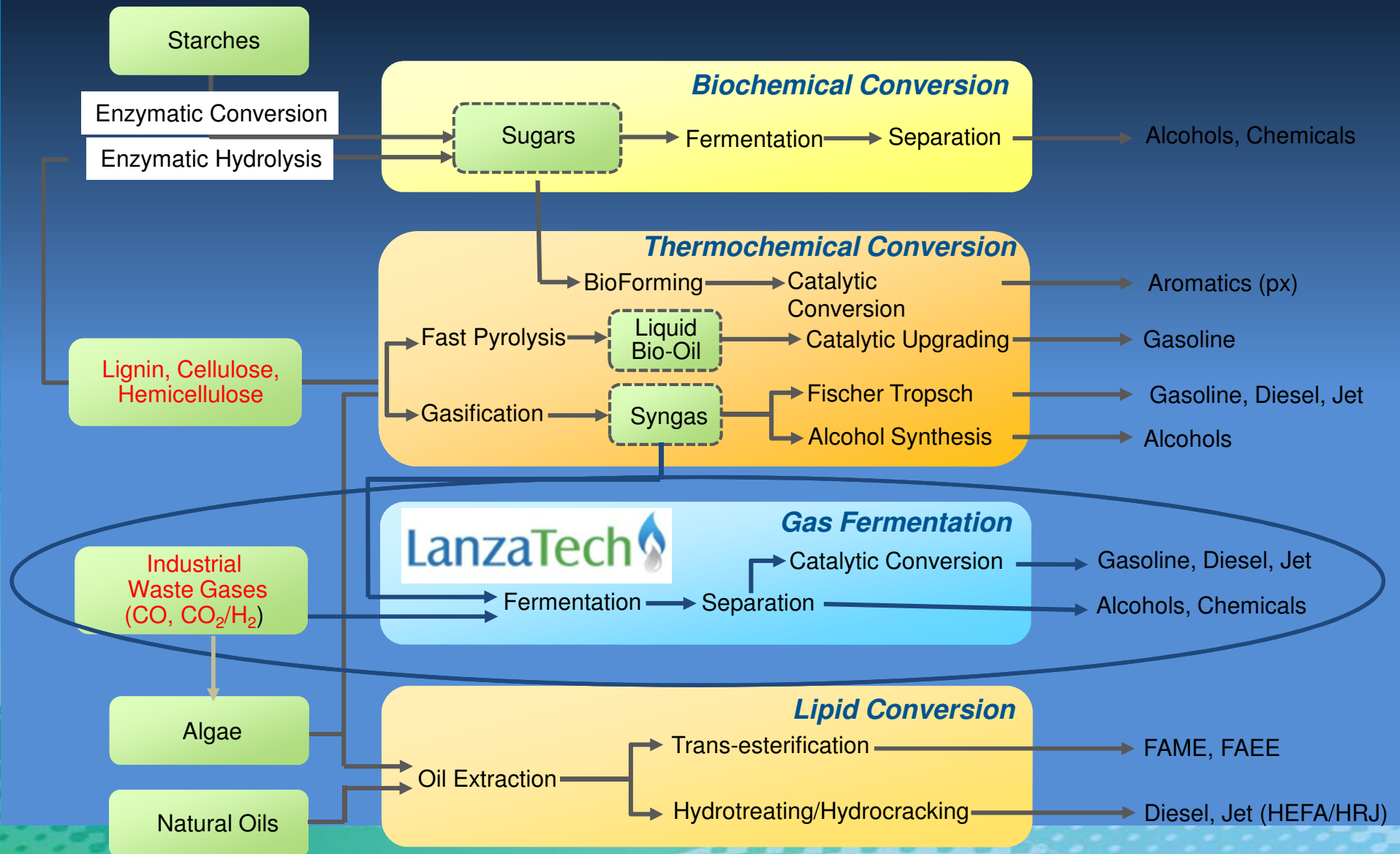
SYNGAS TO ETHANOL

Novel gas fermentation technology captures CO-rich gases and converts the carbon to fuels and chemicals



ETHANOL GENERATOR – APPROXIMATED AT 70 KL/DAY FROM A 1000 TPD UNSEGREGATED MSW INPUT DISTILLERY

SYNGAS TO ETHANOL



CONCORD BLUE – BUILDING A BETTER TOMORROW

