

**AL OWAIS GROUP MOVING TOWARDS CLEAN FUEL  
CIRCULAR ECONOMY**



**ESTABLISHED 1997 : EVOLVING CONTINUOUSLY**

**EARLY PHASE (1997 – 2000)**

**MICRO AND SMALL WIND MILL**

**SOLAR THERMAL FOR STEAM & POWER GENERATION**

**COMBUSTORS SPACE / MISSILE STATIONS**

**MATURE YEARS (2000 – 2006)**

**ORGANIC RANKINE CYCLE TURBINE**

**STEAM RANKING CYCLE TURBINE**

**HYDROGEN GAS GENERATORS**

**HYDROGEN & OXYGEN GAS GENNERATOR-HYDROXY**

**THE COMPANY (2006 ONWARDS)**

**ORC AND STEAM RANKINE CYCLE TURBINE**

**GASIFICATION TECHNOLOGY FOR CLEAN ENERGY**

**CRUDE OIL FROM ALGAE**

**STEAM GENERATOR USING PLASMA TECHNOLOGY**

**HYDROGEN AND BROWN GAS GENERATOR**





## ◆ CURRENT COMPANY ACTIVITIES

**GASIFICATION TECHNOLOGY**

**WASTE HEAT RECOVERY SYSTEM**

**HYDROXY – HYDROGEN AND OXYGEN GENERATOR**

**ORGANIC RANKINE CYCLE (ORC) TURBINE**

**STEAM RANKINE CYCLE TURBINE**

**COMBUSTORS**

## ◆ MAJOR ACHIEVEMENTS

**LEADER IN COMBUSTORS**

**ENJOY HIGHEST CREDIT RATINGS**

**ORC , HYDROXY AND GASIFICATIONS ARE PATENTED**

**EMPLOYEE PARTICIPATION IN VISION & MISSION**

**SPECIALIST IN WASTE HEAT RECOVERY SYSTEM**

**LEADER IN WIND MILL AND HYDROGEN FUEL**





## **CURRENT GROUP COMPANIES**

**MODERN BAKERY LLC, DUBAI, ABU DHABI**

**SHROOQ AL SHAMS TRADING LLC., AJMAN**

**AL SHROOQ GREEN ENERGY, RAS AL KHAIMAH**

**VAIGUNTH ENERTEK PVT. LTD., INDIA**

**SHROOQ AL ENERGY PVT. LTD., INDIA**

**EICS INTERNATIONAL LLC, DUBAI**

**HELIO ENGINEERING PVT. LTD., INDIA**

**TRANSPERANT ENERGY SYSTEM PVT. LTD., INDIA**

**AL OWAIS TRADING, SHARAJH**

**SAHARA FILTERS & PURIFICATION, SHARAJH**

**SPLENDOR BLDG CONSTRUCTION, SHARAJH**

**GREENGROWTH SUSTAINABILITY SERVICES, INDIA**

**GREEN VALLEY HOLIDAY RESORT, SRILANKA**



## DIVERSIFIED BUSINESS PORTFOLIO

### SERVICES

ENERGY, SAFETY AND WATER AUDITS

FEASIBILITY & DETAILED PROJECT REPORTS

ENGINEERING CONSULTANCY

TURNKEY CONSULTANCY

BOOT / BOO/ EPC / TURNKEY PROJECTS

OPERATION AND MAINTENANCE

ENGINEERING MANPOWER SERVICES

CONTRACTING SERVICES

### MANUFACTURING

ORGANIC RANKINE CYCLE TURBINE

HYDROXY / HYDROGEN GENERATOR

WASTE HEAT RECOVERY SYSTEM

VAPOURISER / REACTOR

COMBUSTORS FOR SPACE APPLICATION

ALGAE –OIL PROCESSING EQUIPMENT

GASIFICATION SYSTEM

VESSELS AND EXCHANGER



## **THE VISION**

**TO BE THE PREFERRED ENERGY SOLUTION PROVIDER FROM WASTE AND RENEWABLE SOURCES IN ASIA AND AFRICA CONTINENT, WITH FOCUS ON IMPROVEMENTS IN QUALITY, PRODUCTIVITY, ENVIRONMENT AND SAFETY.**



## **THE MISSION**

**TO BE A KNOWLEDGE DRIVEN, INNOVATIVE AND ETHICAL BUSINESS UNIT, STRIVING TO PROVIDE 'THE STATE OF THE ART' TURNKEY PROJECT ENGINEERING SOLUTIONS AND ENHANCEMENT IN INDUSTRIAL TECHNOLOGIES WITH PROVEN TRACK RECORD IN GASIFICATION, ENERGY EFFICIENCY, RENEWABLE AND OTHER RELATED PROJECTS.**



# **CURRENT FOCUSSED SECTORS**

***REDUCE \* REUSE \* RECYCLE***

- **REDUCE THE ENERGY CONSUMPTION**
  - *Energy audit and use of energy saving products*
- **REUSE THE ENERGY**
  - *Energy conversion, Low heat recovery systems etc*
- **RECYCLE THE ENERGY**
  - *Recycle – Gasification of MSW, Sewerage Sludge etc*





## GLOBAL WASTE GENERATION

- **THE WORLD GENERATES ABOUT 4 Bn TONS OF WASTE /YEAR**
- **THE WORLD CITIES GENERATE 1.5 Bn TONS OF WASTE / YEAR AND 2.4 BILLION TONS BY 2025**
- **THE WASTE GENERATION IN LOWER INCOME COUNTRIES, WILL BE MORE THAN DOUBLED OVER THE NEXT 25 YEARS**

***But, only 25% of the solid waste is being recycled and the balance 75% is disposed in landfills***





## EVIDENT PROBLEMS / ISSUES OF WASTE

- DEMAND TO INCREASE LAND FILL
- GROUND & SURFACE WATER CONTAMINATION
- BAD ODOUR, PESTS, RODENTS & WIND-BLOWN LITTER
- GENERATION OF INFLAMMABLE GAS
- FIRES WITHIN THE WASTE DUMP
- EROSION & STABILITY PROBLEMS RELATING TO SLOPES
- EPIDEMICS THROUGH STRAY ANIMALS
- ACIDITY TO SURROUNDING SOIL, ETC



# **APPLICATION OF GASIFICATION**

## **THE SPECIALISATION IN COMBUSTION TECHNOLOGY**

**MUNICIPALITY SOLID WASTE (MSW)**

**SEWERAGE PLANT WASTE - BIO-SOLIDS**

**AGRICULTURAL WASTE – BIO MASS**

**ANIMAL WASTE - BIO-SOLIDS**

**COAL / CHAR COAL**

**PETROLEUM COKE**



# **GASIFICATION VS INCINERATION**

## **GASIFICATION**

**ALLOWABLE UPTO 20% MOISTURE**

**GASIFICATION PROCESS ALLOWS DRYING**

**DESIGNED FOR H<sub>2</sub> AND CO CONVERSION**

**REDUCING ENVIRONMENT**

**REDUCED OXYGEN LEVEL**

**ENERGY RICH GAS**

**NET POSITIVE ENERGY FROM FEEDSTOCK**

## **INCINERATION**

**NO SPECIFIC REQUIREMENT**

**NO TREATMENT IS REQUIRED**

**DESIGNED FOR H<sub>2</sub>S AND CO<sub>2</sub> CONVERSION**

**HIGHLY OXIDIZING ENVIORNMENT**

**EXCESS AIR**

**RECOVERY OF WASTE HEAT**

**COMPARATIVELY LESS EFFICIENT**



# **GASIFICATION TECHNOLOGY**

**RELATIVELY NEW IN COMBUSTION ENGINEERING**

**WASTE TO ENERGY WITH GASIFICATION IS  
HIGHLY EFFICIENT**

**INCREASINGLY POWER / CEMENT PLANTS  
UTILIZE WASTE AS THEIR FUEL RATHER THAN  
CONVENTIONAL SOURCES OF ENERGY LIKE  
COAL, OIL OR NATURAL GAS**

**HYDROGEN OXYGEN INVERTER BURNER  
COMBUSTOR – IT'S A CLOSED LOOP  
TECHNOLOGY– PATENTED BY US**

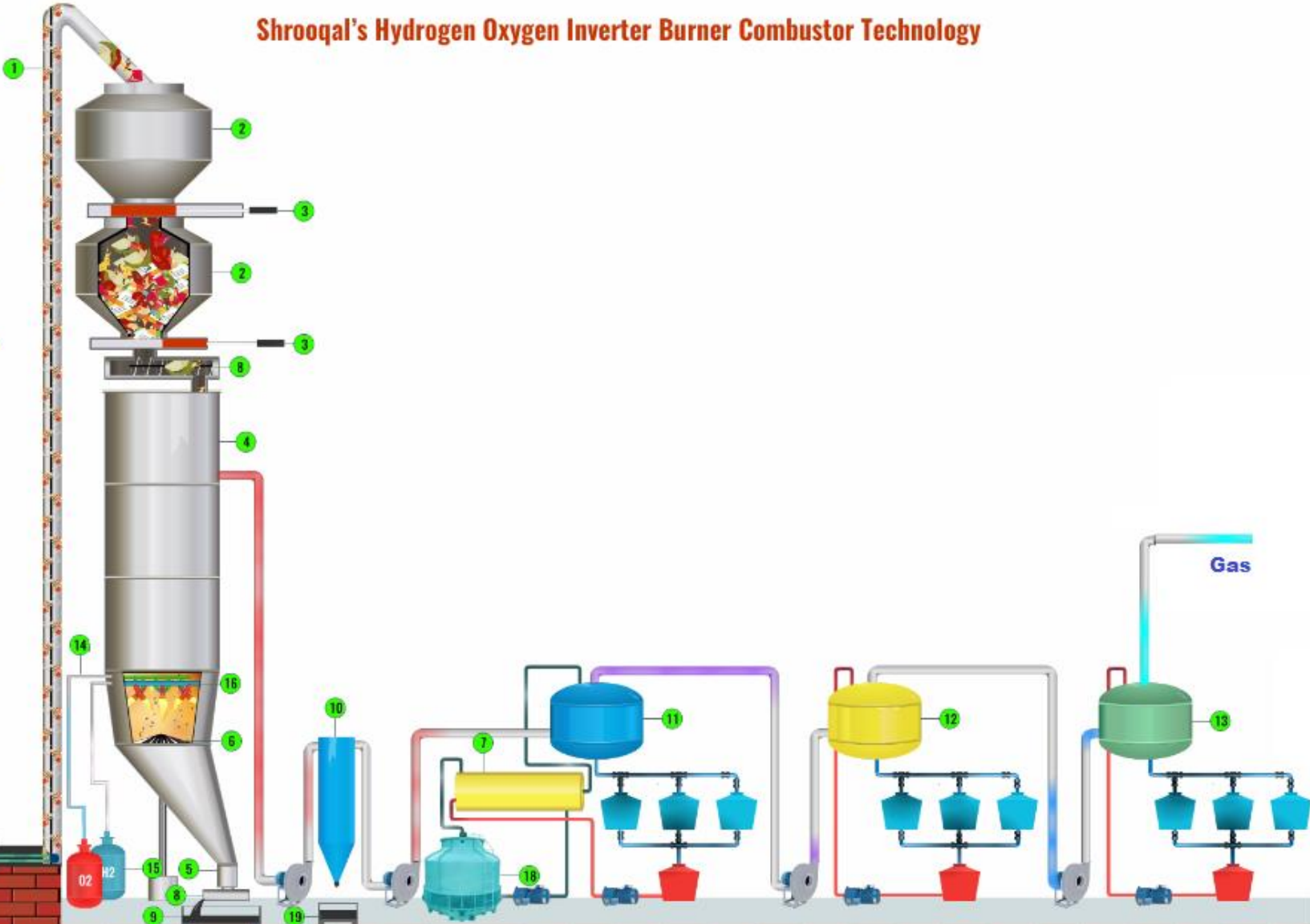
**THIS GAS (SYNGAS) IS A CLEAN ENERGY**



## MSW / BIO - SOLID GASIFICATION PROCESS

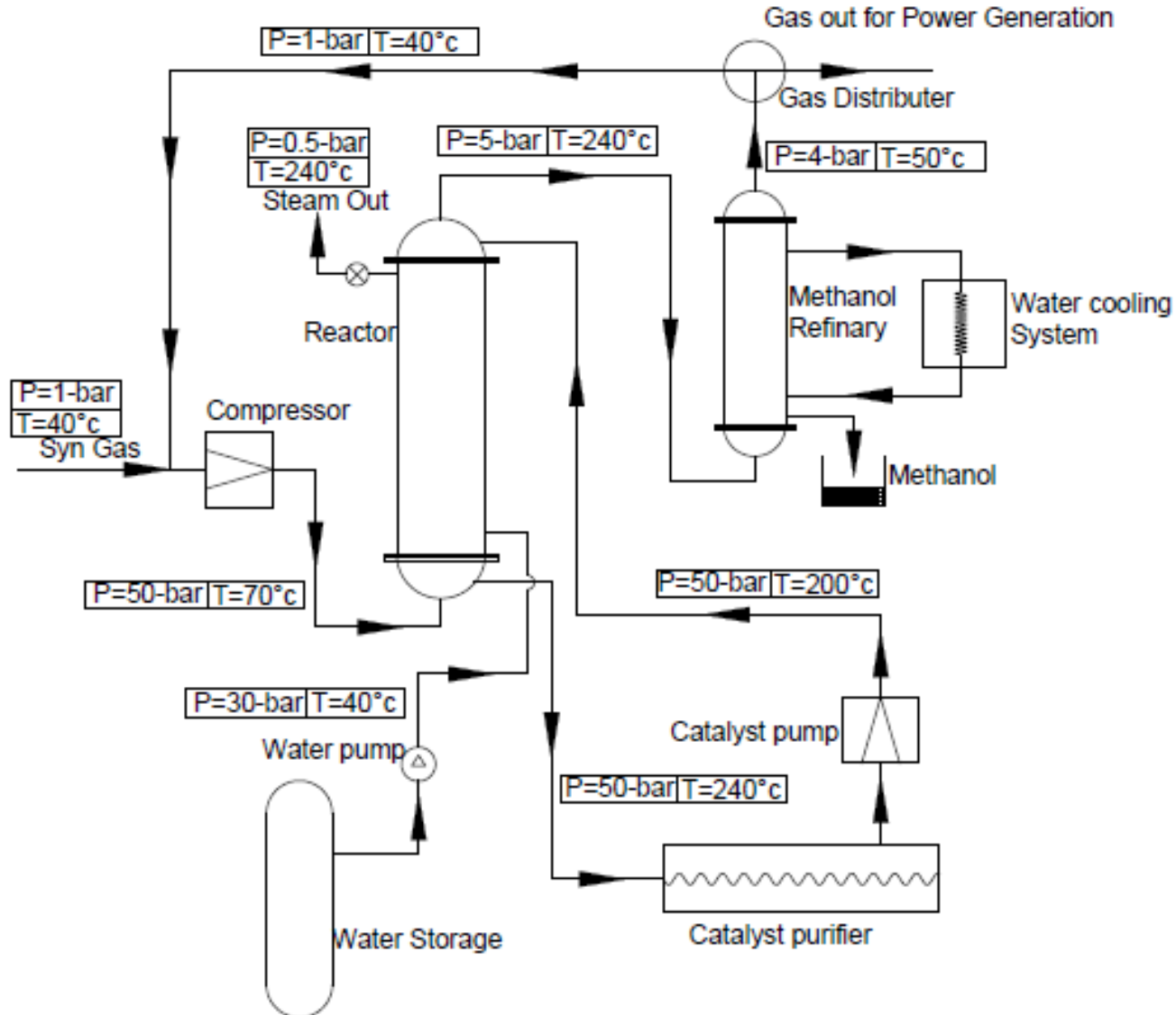
- 1 Vertical Screw Feeder
- 2 Hopper
- 3 Shutter
- 4 Reaction Chamber
- 5 Combustion Chamber
- 6 Rotor Fire Grate
- 7 Heat Exchanger
- 8 Screw Feeder
- 9 Ash quenching System
- 10 Cyclone
- 11 Water purifier
- 12 Acid Purifier
- 13 Alkaline Purifier
- 14 O<sub>2</sub> Generator
- 15 H<sub>2</sub> Generator
- 16 Burner Assemble
- 17 Syn Gas
- 18 Cooling Tower
- 19 Tar Collector
- 20 Compressor

Shrooqal's Hydrogen Oxygen Inverter Burner Combustor Technology





## SCHEMATIC DIAGRAM FOR WASTE to LIQUID (METHANOL)



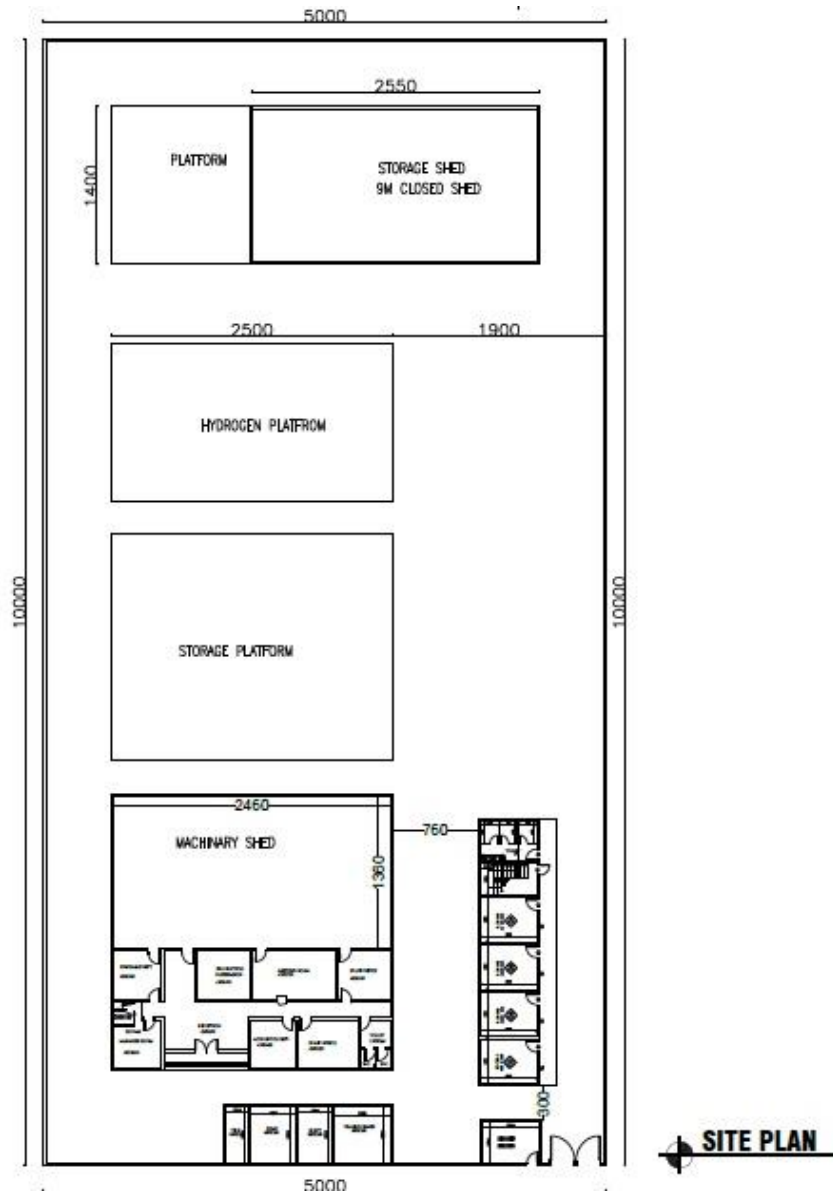




## TYPICAL PLANT VIEW OF WASTE TO LIQUID

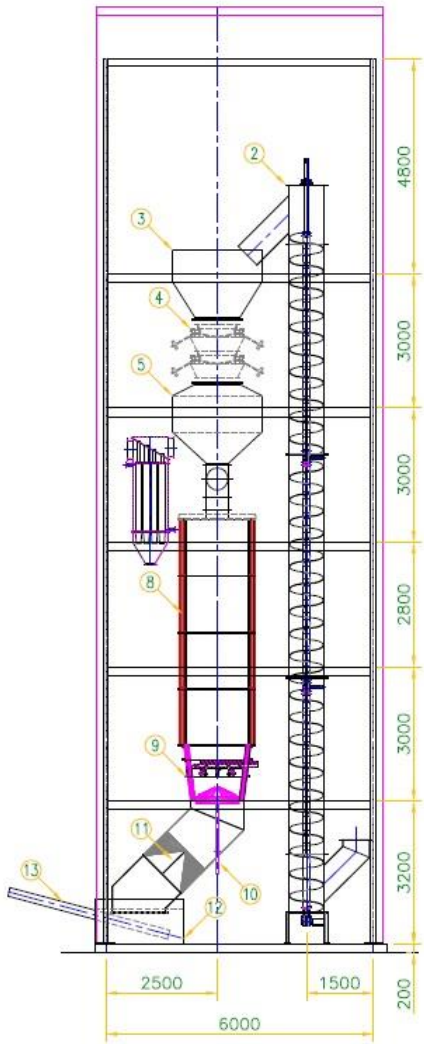
### 60 TPD CAPACITY PLANT REQUIREMENT

- LAND AREA . 5000 Sq. M
- BUILT AREA. 1205 Sq. M
- PROCESS SKID. 45 + 45 Sq. M
- MSW STORAGE 345 Sq. M
- ADMIN BLDG. 260 Sq. M
- AMINITY BLDG. 182 Sq. M
- POWER @ 600 KW at 415 V
- WATER @ 1000 GPD
- SATETY AND SECURITY



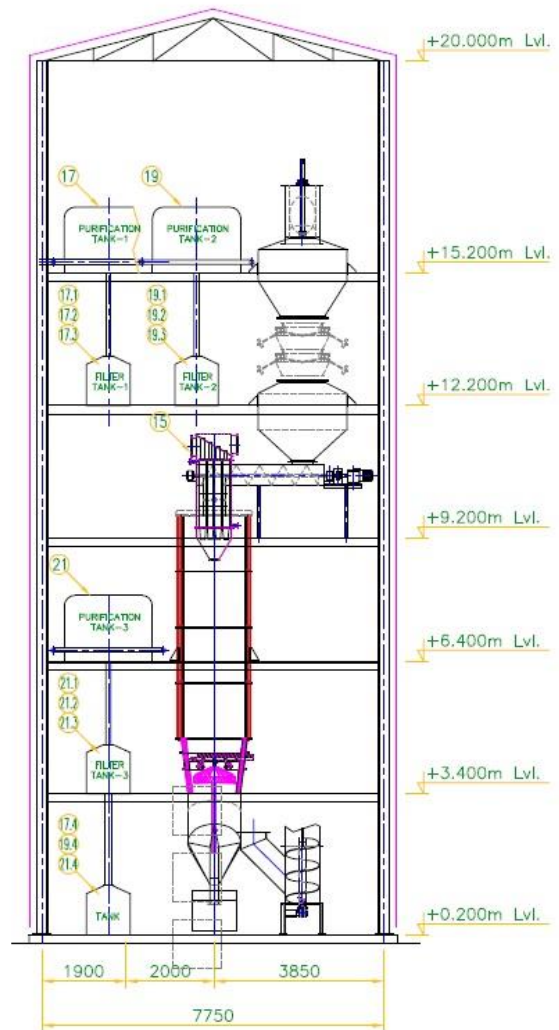


## TYPICAL PLANT VIEW OF GASIFICATION

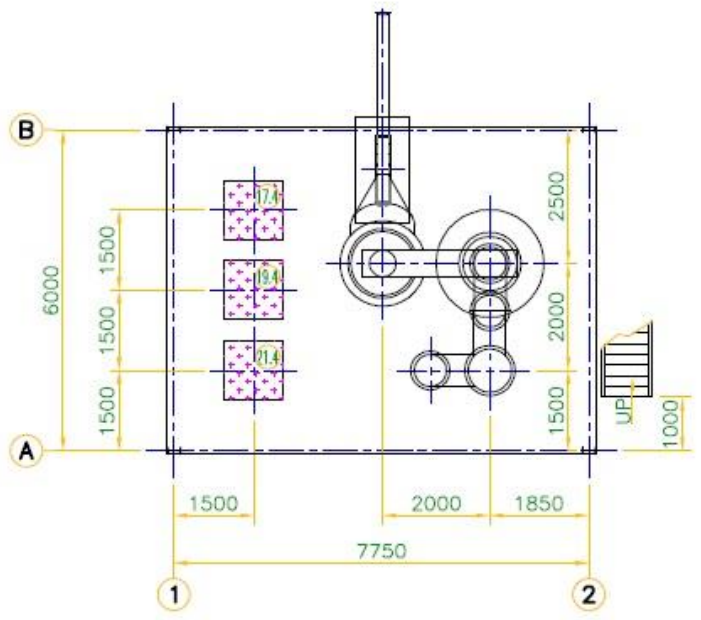
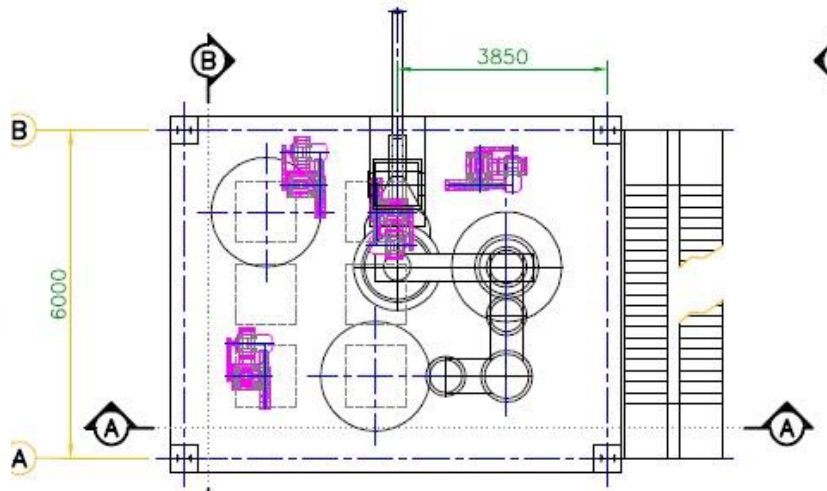


**SECTION-"BB"**

(PURIFICATION TANKS NOT SHOWN FOR CLARITY)



**SECTION-"AA"**



**FLOOR PLAN AT +0.200 M Lvl.**



# **EXECUTION PLAN OF GASIFICATION**

- **CONCEPTUAL DESIGN - COMPLETED**
- **DETAILED ENGINEERING DESIGN - COMPLETED**
- **FABRICATION DETAILED DRAWING - COMPLETED**
- **EQUIPMENT FABRICATION - COMPLETED**
- **STRUCTURAL FABRICATION – IN HOUSE**
- **INSTALLATION METHOD - BOLTING**
- **QUANTITY OF STRUCTURAL – 75 MT**
- **TIME REQUIRED FOR FABRICATION – 45 DAYS**
- **INSTALLATION OF AT SITE – 25 DAYS**



## EXECUTION PLAN OF METHANOL

- **CONCEPTUAL DESIGN - COMPLETED**
- **DETAILED ENGINEERING DESIGN - COMPLETED**
- **FABRICATION DETAILED DRAWING - COMPLETED**
- **MAIN EQUIPMENT FABRICATION – PROGRESS**
- **STRUCTURAL FABRICATION – IN HOUSE**
- **INSTALLATION METHOD - BOLTING**
- **QUANTITY OF STRUCTURAL – 60 MT**
- **TIME REQUIRED FOR FABRICATION – 60 + 30 DAYS**
- **MAIN EQUIPMENT FABRICATION BY – TESPL**
- **INSTALLATION AT SITE – 15 DAYS**



## **EXECUTION PLAN OF CIVIL WORKS**

- **CONCEPTUAL DESIGN - COMPLETED**
- **DETAILED ENGINEERING DESIGN - COMPLETED**
- **FABRICATION DETAILED DRAWING - COMPLETED**
- **APPROVALS – CIVIL DEFENCE – PROGRESS**
- **MISC. CIVIL WORKS – IN HOUSE**
- **PRE- FABRICATED BUILDING – OUT SOURCED**
- **MAJOR CIVIL WORK – \*AL KASER BLDG. CONT. CO.**
- **TIME REQUIRED FOR CIVIL WORKS – 90 – 120 DAYS**
- **MAIN FOUNDATION FOR PLANT IN 60 DAYS**



## PRESENT STATUS – AS ON DATE

- **HP COMPRESSOR – UNDER NEGOTIATION - CHINA**
- **HYDROXY SYSTEM – COMPLETED – IN HOUSE**
- **OXYGEN SUPPLY FOR TESTING – EIG / BG – EX-WORKS**
- **OXYGEN PLANT FOR PRODUCTION – EIG - COMPLETED**
- **SHREDDER - UNDER PROGRESS – INDIA – ALFA THERM**
- **CATALYST – SAMPLES RECEIVED FOR TESTING**
- **APPROVALS – CIVIL DEFENCE – PROGRESS**
- **PRE-FABRICATED SHED – UNDER PROGRESS FOR YARD**
- **ESTIMATED TIME TO START TESTING – 120 TO 150 DAYS**



## WASTE to METHANOL PLANT CAPACITY

SL. NO	DESCRIPTION	UNIT	QUANTITY IN EACH LOCATION		
			RAK, UAE	INDIA	ABD DHABI
1	INITIAL PLANT CAPACITY / DAY	KGs	60000.00	90,000.00	150,000.00
2	SYNGAS PRODUCTION / DAY	Cu M	54000.00	81000.00	180,000.00
3	SYNGAS PRODUCTION / DAY	KGs	48000.00	72000.00	171,000.00
4	SYNGAS PRODUCTION / DAY	MMBTU	675.00	1012.50	2,137.50
5	BIO TAR PRODUCTION	LTRs	480.00	720.00	1200.00
6	BIO OIL PRODUCTION	LTRs	480.00	720.00	1200.00
6	METHANOL PRODUCTION	LTRs	21600.00	32400.00	72000.00
7	ESTIMATED ASH FOR LAND-FILL	Cu M	21000.00	31000.00	52000.00



## TYPICAL COMPOSITION OF SYNGAS IN CLOSED LOOP TECHNOLOGY

SUBSTANCE	% Range in Volume		MSW GAS	BIO-SOLID GAS
Hydrogen (H <sub>2</sub> )	20	40	32.42%	32.42%
Carbon Monoxide (CO)	35	40	49.98%	49.98%
Carbon Dioxide (CO <sub>2</sub> )	25	35	7.20%	7.20%
Methane (CH <sub>4</sub> )	0	15	3.90%	3.90%
Nitrogen (N <sub>2</sub> )	2	5	4.52%	4.52%
Oxygen (O <sub>2</sub> )			-	-
Others			1.98%	1.98%
<b>Calorific Value (Kj / Cu M)</b>			<b>12287.00</b>	<b>12500.00</b>





## ESTIMATED COMMERCIAL BENEFITS

SL. NO	DESCRIPTION	UNIT	UNIT RATE (in AED)	WASTE to METHANOL PLANT		
				RAK, UAE	INDIA	ABD DHABI
1	INITIAL PLANT CAPACITY / DAY	Kgs		60000.00	90,000.00	150,000.00
2	SYNGAS PRODUCTION / DAY	Cu M		54000.00	81000.00	180,000.00
3	SYNGAS PRODUCTION / DAY	TPD		48000.00	72000.00	171,000.00
4	SYNGAS PRODUCTION / DAY	MMBTU		675.00	1012.50	2,137.50
5	REVENUE BIO TAR	Mil' AED	1.00	0.16	0.24	0.40
6	REVENUE BIO OIL	Mil' AED	1.00	0.16	0.24	0.40
6	REVENUE METHANOL	Mil' AED	1.70	12.12	18.18	40.39
7	AMOUNT SAVED IN LOGISTICS	Mil' AED	50.00	0.99	1.49	2.48



## **BUSINESS ASSOCIATES / PARTNERS**

- **VAIGUNTH GROUP, INDIA**
- **EICS GROUP, INDIA & UAE**
- **INCICO, MILAN, ITALY - ENGINEERING**
- **TESPL, PUNE, INDIA – WHR BOILERS**
- **AE & E, NANJING, CHINE - HRSG**
- **CDI, CHENDU, CHINA - WHRPGS**



# **EXPERIENCE COUNTS**

**MORE NO OF PLANT EXPERIENCE IN  
WHR, MSW GASIFICATION AND  
RENEWABLES**

**12 COUNTRIES SERVED**

**MORE THAN 16 YEARS EXPERIENCE  
OVER 250 REFERENCES WORLDWIDE**



**THANK YOU**

**AL OWAIS GROUP OF COMPANIES**

**&**

**ASSOCIATES**