

EQTEC GASIFIER TECHNOLOGY

A SUSTAINABLE WAY TO ENERGY

EQTEC

EBIOSS



БЪЛГАРСКИ ЕНЕРГИЕН ФОРУМ
ЗА ПРОЗРАЧНОСТ В БЪЛГАРСКАТА ЕНЕРГЕТИКАТА

GASIFICATION

GASIFICATION IS THE THERMOCHEMICAL CONVERSION OF RESIDUES INTO GAS, KNOWN AS *SYNTHESIS GAS* OR *PRODUCER GAS*, WHICH IS COMPOSED MAINLY OF MONOXIDE CARBON (CO), HYDROGEN (H₂), METHANE (CH₄), DIOXIDE CARBON (CO₂) AND NITROGEN (N₂).

SYNGAS HAS A HEATING VALUE IN BETWEEN 4 TO 6 MJ/Nm³ AND CAN BE USED AS FUEL TO PRODUCE ELECTRICITY WITH INTERNAL COMBUSTION ENGINES.

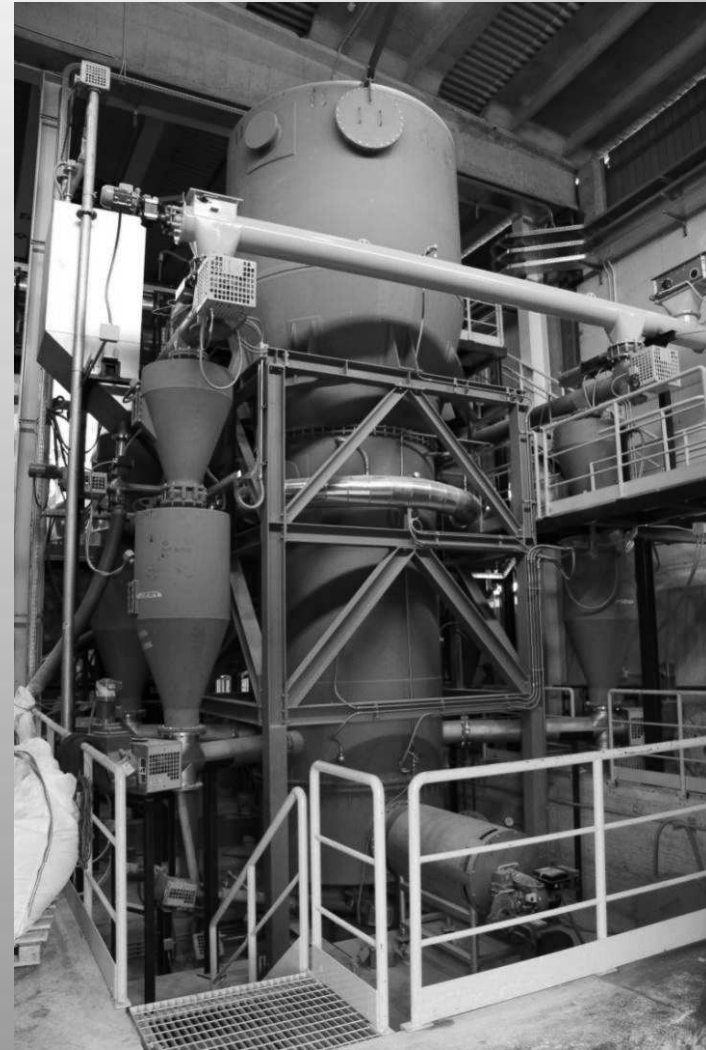
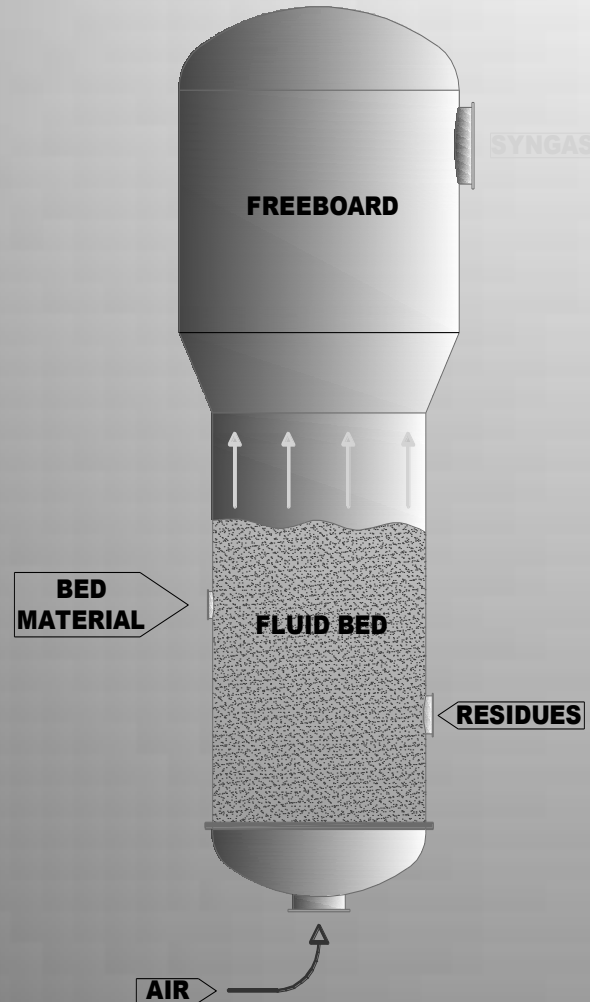
RESIDUES



RESIDUES:

- FROM AGRICULTURE
 - ❖ GRAPE BAGASSE
 - ❖ STRAW
- URBAN WASTE
- FORESTRY WASTE
- INDUSTRIAL WASTE
- RDF
- SAW DUST, PRUNNING

EQTEC GASIFIER



OUR TECHNOLOGY IS BASED ON A BUBBLING FLUID BED GASIFIER

SYNTHESIS GAS COMPOSITION

Element	% Volume almond shell	% Volume olive pulp
HHV	5600 KJ/Nm ³	5800 KJ/Nm ³
LHV	5300 KJ/Nm ³	5350 KJ/Nm ³
CO	20 - 26%	17-19%
H₂	5 - 10%	14%
CH₄	1 - 4%	4.5%
CO₂	4 - 8%	10-11%
N₂	50 - 60%	47-50%
O₂		1.5-1.7%
C_mH_m	0.1 – 0.5%	0.1-0.5%

ADVANTAGES OF GASIFICATION PROCESS

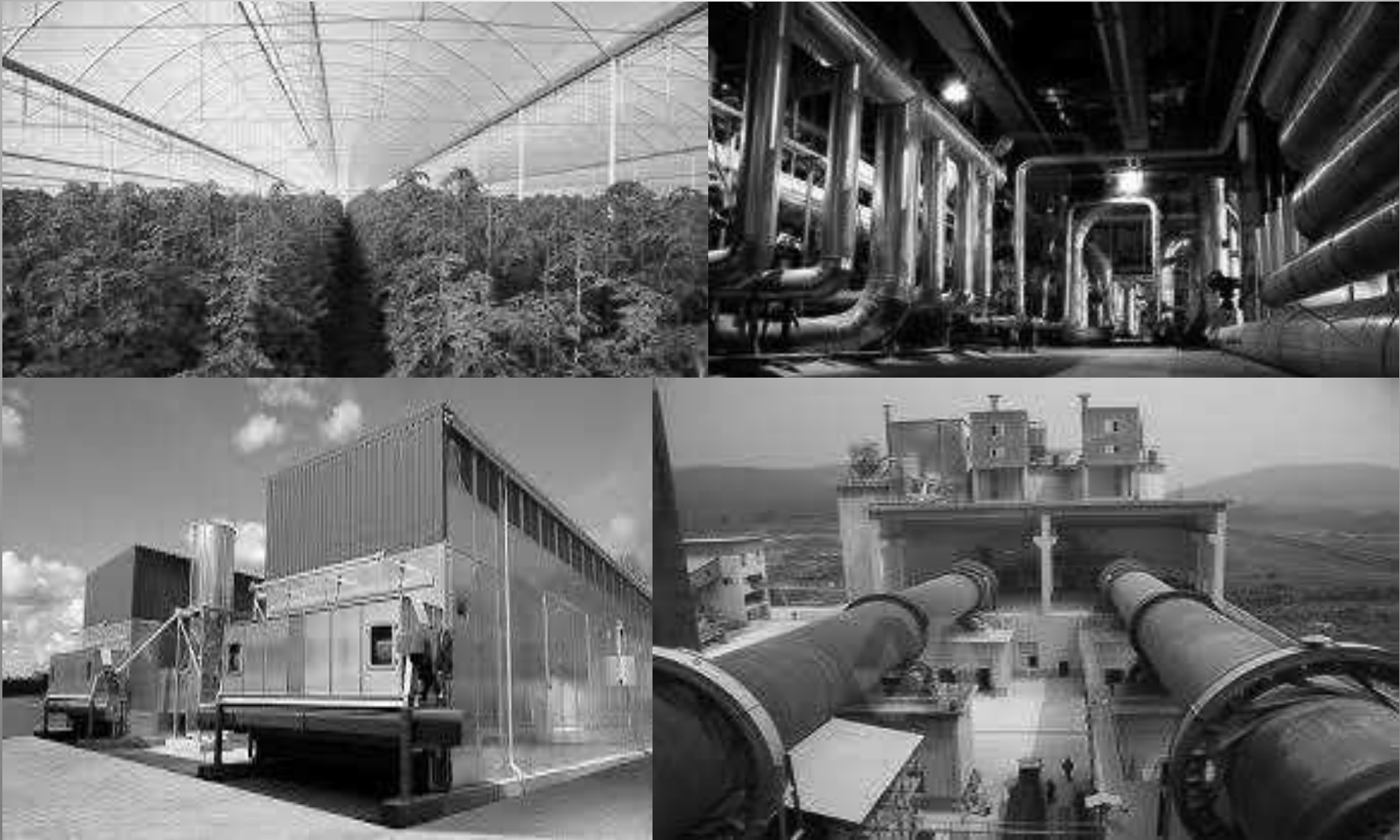
- 1. LOW SCALE ECONOMIC FEASIBILITY (250-15.000 KW)**
- 2. HIGH ELECTRICAL EFFICIENCY (28-34 %)**
- 3. HIGH OVERALL EFFICIENCY UP TO 75-80 %
[ELECTRICAL+THERMAL]**
- 4. MODULAR POWER PLANTS (500-1200-5000-10000 KW)**
- 5. LOW EMISSIONS, ENVIRONMENTAL FRIENDLY
TECHNOLOGY**
- 6. MULTI-FUEL PLANT. MANY RESOURCES CAN BE GASIFIED**

SYNGAS USES (I)



HIGH EFFICIENCY POWER PRODUCTION

SYNGAS USES (II)



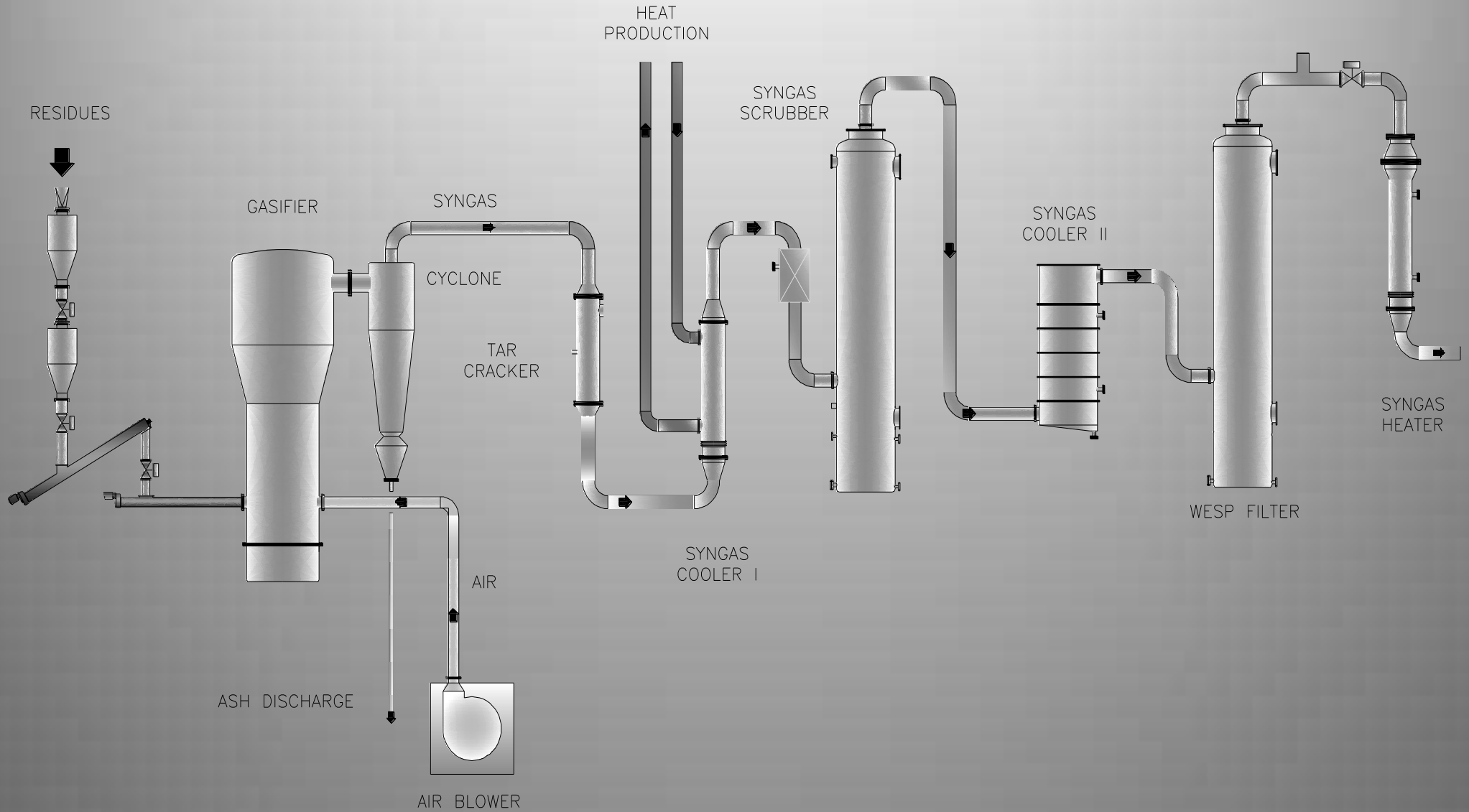
**HEAT PRODUCTION: STEAM, KILNS, GREENHOUSES
DRYERS**

SYNGAS USES (III)

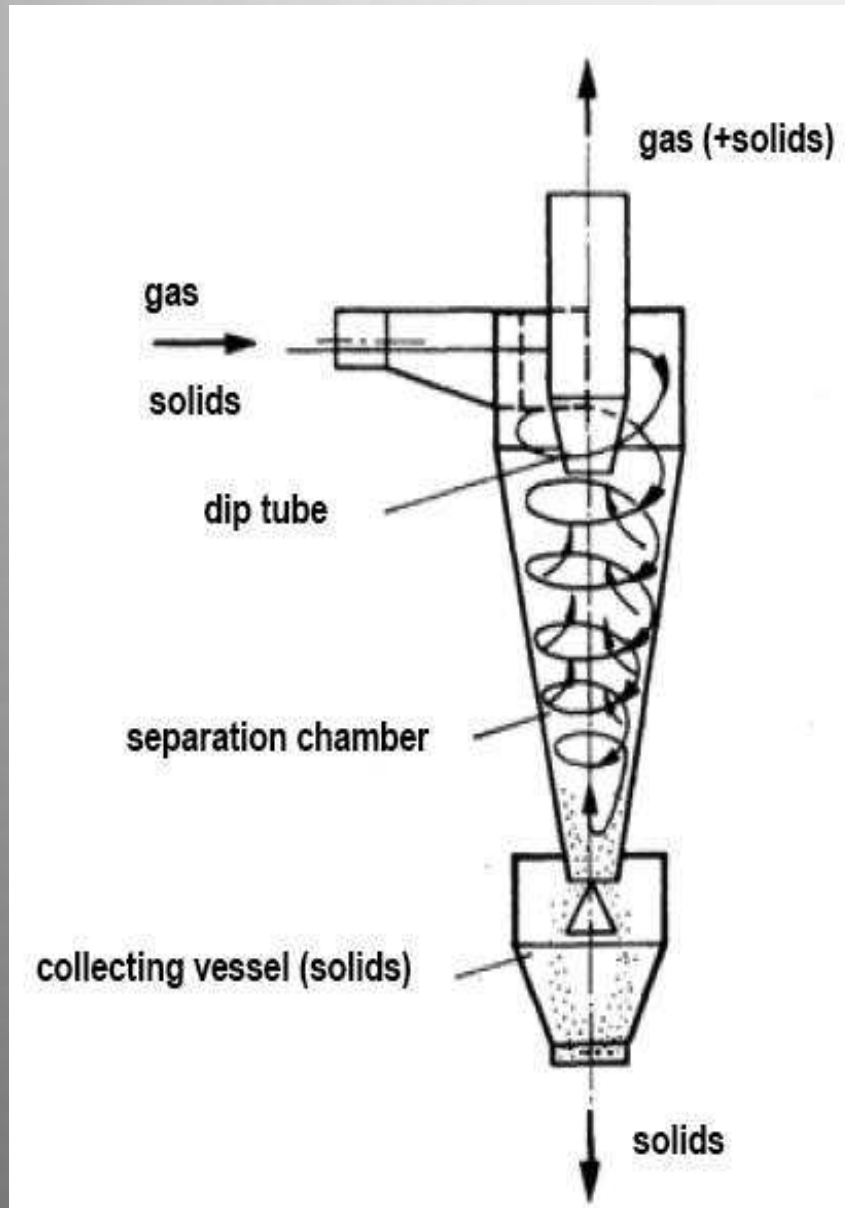


SYNTHETIC FUELS PRODUCTION
- BioSNG, BTL -

INTEGRATED RESIDUES GASIFICATION POWER PLANT



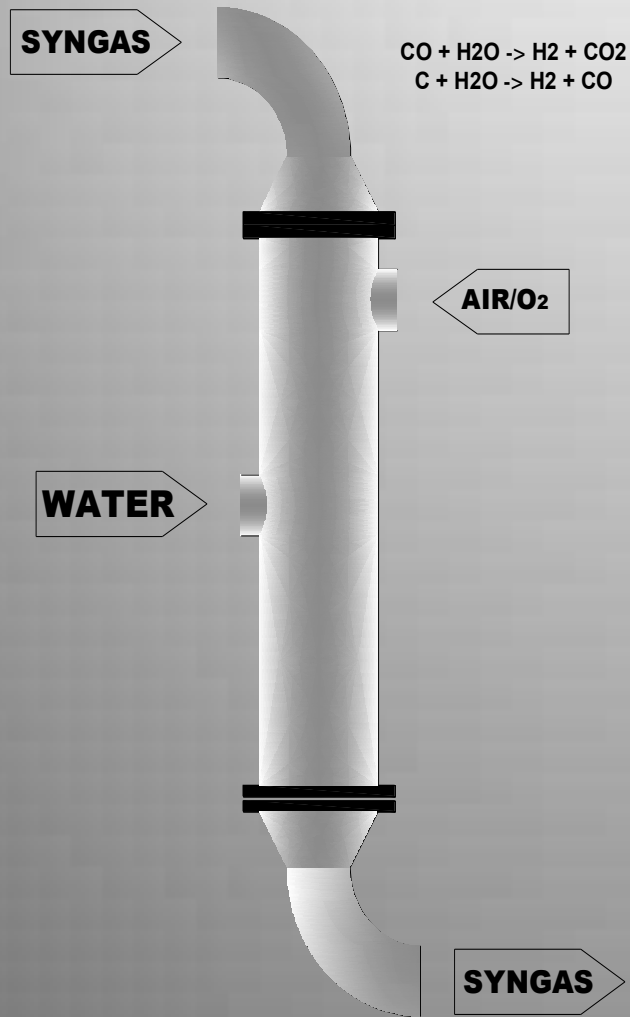
CYCLONE



REMOVAL OF:

- PARTICULATE MATTER
- CHAR

TAR THERMAL CRACKER



**TAR THERMAL/CATALYTIC
CONVERSION INTO SYNGAS**

SYNGAS COOLER

- SYNGAS TEMPERATURE CONTROL
- HEAT PRODUCTION



SYNGAS SCRUBBER

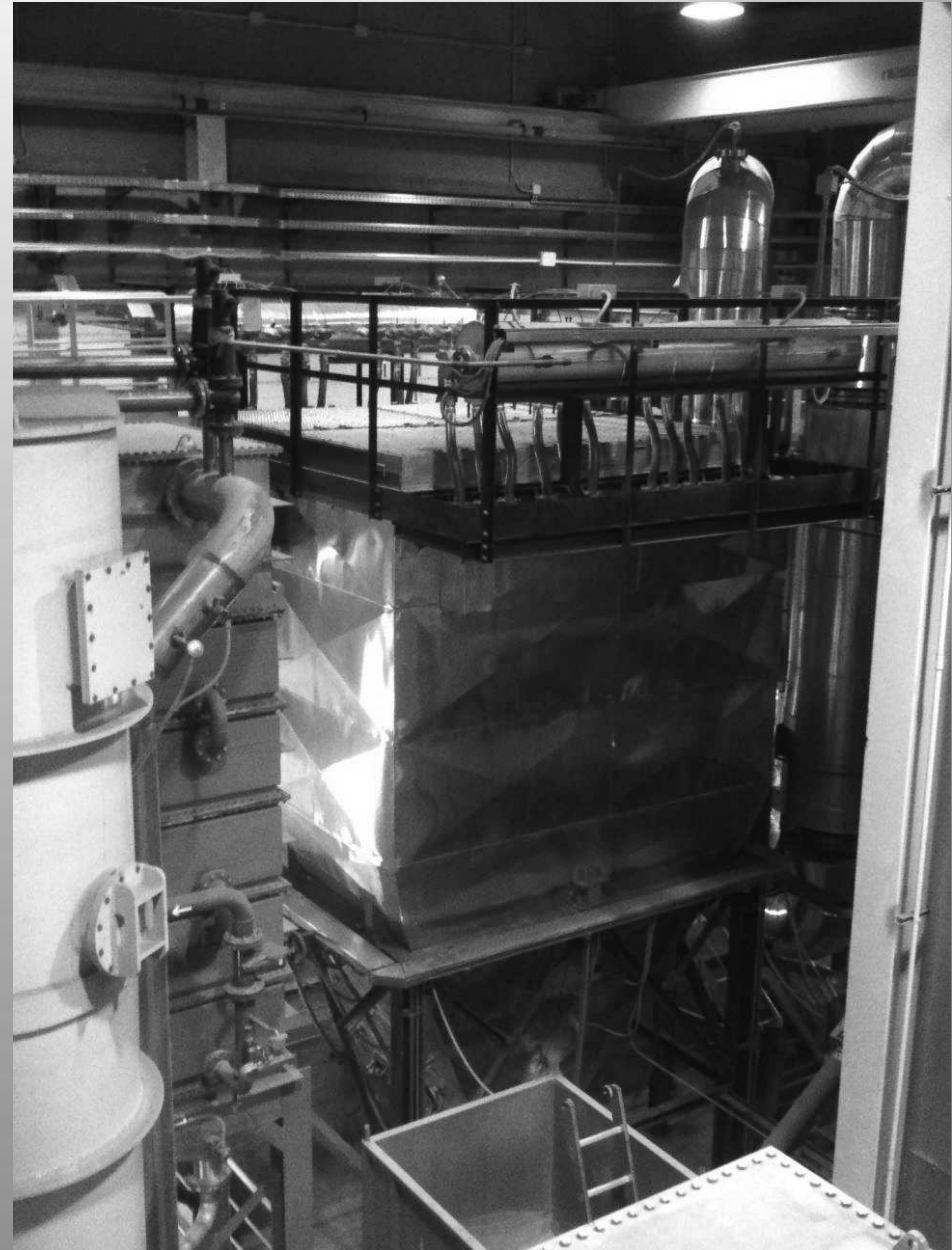
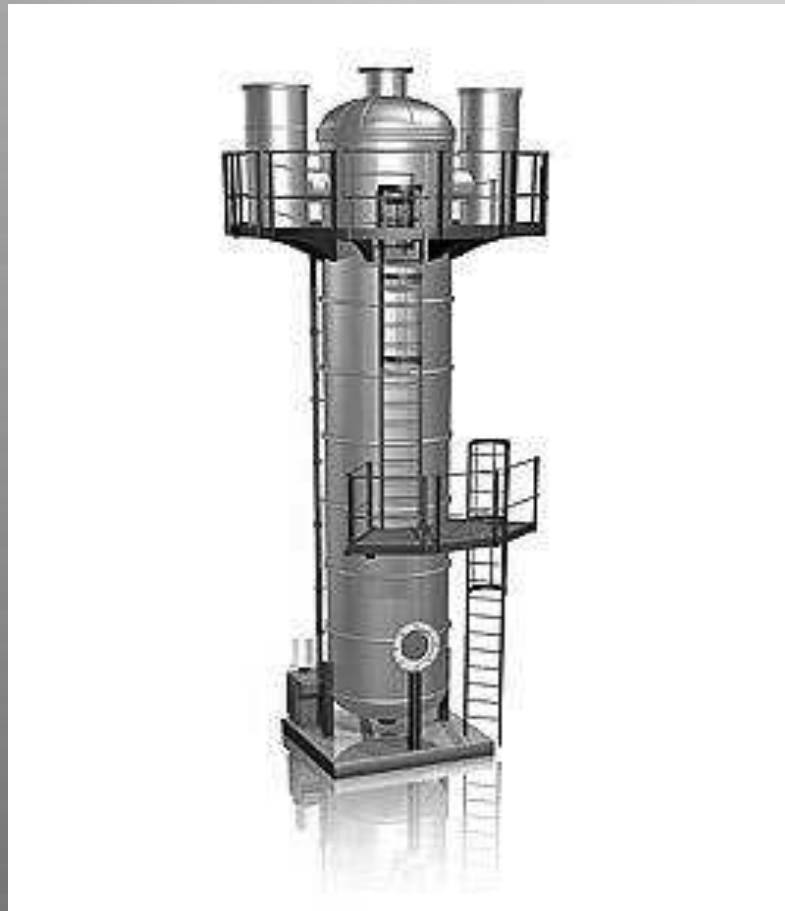


SYNGAS WASHING SYSTEM

WESP FILTER

REMOVAL OF:

- PARTICULATE MATTER
- OIL MIST
- WATER VAPOUR



SYNGAS HEATER



SYNGAS RE-HEATING

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (I)



BIOMASS STORAGE

- GRAPE POMACE
- OLIVE PULP
- OLIVE PITS

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (II)

GENERAL VIEW 1 TON/hr BIOMASS GASIFIER LINE



5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (III)



GENERAL VIEW

4X1000 Kg/h
BIOMASS
GASIFICATION PLANT

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (IV)



SYNGAS

GENERATOR SETS

ENGINE ROOM WITH
THREE 1,97 MWe GAS
GENERATOR SETS,
TOTAL POWER OUTPUT
5,9 MWe

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (V)



**GAS
GENERATORS**

HEAT RECOVERY

HOT WATER PUMPS

159 m³/hr

90 °C

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (VI)



ENGINE ROOM

OUTSIDE VIEW

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (VII)



PUBLIC GRID CONNECTION

ELECTRICITY IS SOLD TO LOCAL ELECTRICAL COMPANY (UNION FENOSA) UNDER THE RENEVABLE ENERGY LAW OF SPAIN

5,9 MWe INTEGRATED BIOMASS GASIFICATION CHP PLANT MOVIALSA - SPAIN (VIII)

		NOMINAL OUTPUT
1. BIOMASS CONSUMPTION	(KW)	19600
	(Kg/h)	4000
2. ENGINES EXHAUST GAS FLOW	(Kg/h)	43197
3. ENGINES EXHAUST GAS TEMPERATURE	(°C)	456
4. ENGINES EXHAUST GAS HEAT STEAM GENERATION (6 bar sat)	(KW)	3810
	(Kg/h)	5600
5. ENGINE HT COOLING CIRCUIT HEAT 90 °C HOT WATER GENERATION	(KW)	2778
	(m3/h)	159
6. TOTAL HEAT OUTPUT	(KW)	6.588
7. ELECTRICAL POWER OUTPUT	(KW)	5.922
8. ELECTRICAL EFFICIENCY	(%)	30,2
9. THERMAL EFFICIENCY	(%)	33,6
10. TOTAL EFFICIENCY	(%)	63,8

HEAT BALANCE

1 MWe INTEGRATED BIOMASS (STRAW) GASIFICATION POWER PLANT (ITALY)

BIOMASS GASIFIER

BIOMASS SILO



1 MWe INTEGRATED BIOMASS (STRAW) GASIFICATION POWER PLANT (ITALY)



1 MWe SYNGAS GENERATOR SET

**850 kg/h BIOMASS
GASIFICATION
PLANT**



**50 kg/h R&D
BIOMASS
GASIFICATION
PLANT**



EQTEC



**THANK YOU VERY
MUCH FOR YOUR
ATTENTION**

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