11 Annexes

11.1 NPV First Option

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Cash flow	8,559,972 €	9,800,312 €	11,220,377 €	12,846,210 €	14,707,626 €	15,737,160 €
Interest rate	109,5%	131,3%	157,4%	188,8%	226,3%	247,8%
Social Expenses	85,600 €	98,003 €	112,204 €	128,462 €	147,076 €	157,372 €
Net Cash flow	7,817,326 €	7,464,445 €	7,127,494 €	6,805,753 €	6,498,536 €	6,350,167 €
Investment	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €
Sumatory Cash flow	7,817,326 €	22,920,620 €	37,342,138 €	51,112,657 €	64,261,563 €	70,611,730 €
Pendind loan	-36,182,674 €	-21,079,380 €	-6,657,862 €	7,112,657 €	20,261,563 €	26,611,730 €

SOURCE: Own elaboration

11.2 NPV Second Option

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Cash flow	6,395,172 €	7,050,677 €	7,773,372 €	8,570,142 €	9,448,582 €	9,921,011 €
Interest rate	109,5%	131,3%	157,4%	188,8%	226,3%	247,8%
Social Expenses	31,976 €	35,253 €	38,867 €	42,851 €	47,243 €	49,605 €
Net Cash flow	5,840,340 €	5,370,175 €	4,937,861 €	4,540,349 €	4,174,837 €	4,003,269 €

Investment	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €	44,000,000 €
Sumatory Cash flow	5,840,340 €	16,810,841 €	26,898,185 €	36,173,469 €	44,702,065 €	48,705,333 €
Pendind loan	- 38,159,660 €	- 27,189,159 €	- 17,101,815 €	- 7,826,531 €	702,065 €	4,705,333.37 €

SOURCE: Own elaboration

11.3 NPV Third option

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Cash flow	6,395,172	6,917,018	7,481,447	8,091,933	8,752,235	9,102,324
Interest rate	109,5%	131,3%	157,4%	188,8%	226,3%	247,8%
Social Expenses	31,976	34,585	37,407	40,460	43,761	45,512
Net Cash flow	5,840,340	5,268,373	4,752,422	4,287,000	3,867,158	3,672,917
Investment	44,000,000	44,000,000	44,000,000	44,000,000	44,000,000	44,000,000
Sumatory Cash flow	5,840,340	16,655,703	26,411,877	35,212,592	43,151,420	46,824,337
Pendind loan	- 38,159,660 €	- 27,344,297€	- 17,588,123 €	- 8,787,408 €	- 848,580 €	2,824,337 €

SOURCE: Own elaboration

11.4 First option accounts,

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flow (income - expenses)	8.559.972 €	9.159.170 €	9.800.312 €	10.486.334 €	11.220.377 €	12.005.804 €	12.846.210 €	13.745.445 €	14.707.626 €	15.737.160 €
Amortization 20 years	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €	2.047.460 €
operating result	**6.512.512 €**	**7.111.710 €**	**7.752.852 €**	**8.438.874 €**	**9.172.917 €**	**9.958.344 €**	**10.798.750 €**	**11.697.985 €**	**12.660.166 €**	**13.689.700 €**
Capital loan		2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €	2.444.444 €
Accumulated paid		22.000.000 €	19.555.556 €	17.111.111 €	14.666.667 €	12.222.222 €	9.777.778 €	7.333.333 €	4.888.889 €	2.444.444 €
Accumalated capital paid		2.444.444 €	4.888.889 €	7.333.333 €	9.777.778 €	12.222.222 €	14.666.667 €	17.111.111 €	19.555.556 €	22.000.000 €

Interest rate	114%	114%	114%	114%	114%	114%	114%	114%	114%	114%
Interests	- €	341.733 €	683.467 €	1.025.200 €	1.366.933 €	1.708.667 €	2.050.400 €	2.392.133 €	2.733.867 €	3.075.600 €
SOROZNO CAPITAL	**1.760.000 €**	**1.760.000 €**	**1.760.000 €**	**1.760.000 €**	**1.760.000 €**					
SOROZNO PENDING	**8.800.000 €**	**7.040.000 €**	**5.280.000 €**	**3.520.000 €**	**1.760.000 €**					
SOROZNO INTERES	**636.240 €**	**508.992 €**	**381.744 €**	**254.496 €**	**127.248 €**					
Social Expenses	**85.600 €**	**91.592 €**	**98.003 €**	**104.863 €**	**112.204 €**	**120.058 €**	**128.462 €**	**137.454 €**	**147.076 €**	**157.372 €**
Financial expenses	**2.396.240 €**	**5.055.170 €**	**5.269.655 €**	**5.484.140 €**	**5.698.626 €**	**4.153.111 €**	**4.494.844 €**	**4.836.578 €**	**5.178.311 €**	**5.520.044 €**
Profit or loss of the year	4.030.673 €	1.964.949 €	2.385.194 €	2.849.870 €	3.362.088 €	5.685.175 €	6.175.444 €	6.723.953 €	7.334.779 €	8.012.284 €

11.5 Second option accounts

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flow (income - expenses)	6,395,172 €	6,714,931 €	7,050,677 €	7,403,211 €	7,773,372 €	8,162,040 €	8,570,142 €	8,998,649 €	9,448,582 €	9,921,011 €
Amortization 20 years	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €
operating result	**4,347,712 €**	**4,667,471 €**	**5,003,217 €**	**5,355,751 €**	**5,725,912 €**	**6,114,580 €**	**6,522,682 €**	**6,951,190 €**	**7,401,122 €**	**7,873,551 €**
Capital loan		2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €
Accumulated paid		22,000,000 €	19,555,556 €	17,111,111 €	14,666,667 €	12,222,222 €	9,777,778 €	7,333,333 €	4,888,889 €	2,444,444 €
Accumalated capital paid		2,444,444 €	4,888,889 €	7,333,333 €	9,777,778 €	12,222,222 €	14,666,667 €	17,111,111 €	19,555,556 €	22,000,000 €

Interest rate	114%	114%	114%	114%	114%	114%	114%	114%	114%	114%
Interests	- €	341,733€	683,467 €	1,025,200 €	1,366,933 €	1,708,667 €	2,050,400 €	2,392,133 €	2,733,867 €	3,075,600 €
SOROZNO CAPITAL	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**					
SOROZNO PENDING	**8,800,000 €**	**7,040,000 €**	**5,280,000 €**	**3,520,000 €**	**1,760,000 €**					
SOROZNO INTERES	**636,240 €**	**508,992 €**	**381,744 €**	**254,496 €**	**127,248 €**					
Social Expenses	**63,952 €**	**67,149 €**	**70,507 €**	**74,032 €**	**77,734 €**	**81,620 €**	**85,701 €**	**89,986 €**	**94,486 €**	**99,210 €**
Financial expenses	**2,396,240 €**	**5,055,170 €**	**5,269,655 €**	**5,484,140 €**	**5,698,626 €**	**4,153,111 €**	**4,494,844 €**	**4,836,578 €**	**5,178,311 €**	**5,520,044 €**
Profit or loss of the year	1,887,521 €	-454,848 €	-336,944 €	-202,421 €	-50,448 €	1,879,849 €	1,942,137 €	2,024,625 €	2,128,325 €	2,254,297 €

SOURCE: Own elaboration

11.6 Third option accounts

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Cash flow (income - expenses)	6,395,172 €	6,650,979 €	6,917,018 €	7,193,699 €	7,481,447 €	7,780,705 €	8,091,933 €	8,415,610 €	8,752,235 €	9,102,324 €
Amortization 20 years	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €	2,047,460 €
operating result	**4,347,712 €**	**4,603,519 €**	**4,869,558 €**	**5,146,239 €**	**5,433,987 €**	**5,733,245 €**	**6,044,473 €**	**6,368,150 €**	**6,704,775 €**	**7,054,864 €**
Capital loan		2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €	2,444,444 €
Accumulated paid		22,000,000 €	19,555,556 €	17,111,111 €	14,666,667 €	12,222,222 €	9,777,778 €	7,333,333 €	4,888,889 €	2,444,444 €
Accumalated capital paid		2,444,444 €	4,888,889 €	7,333,333 €	9,777,778 €	12,222,222 €	14,666,667 €	17,111,111 €	19,555,556 €	22,000,000 €

interest rate	114%	114%	114%	114%	114%	114%	114%	114%	114%	114%
Interests	€	341,733 €	683,467 €	1,025,200 €	1,366,933 €	1,708,667 €	2,050,400 €	2,392,133 €	2,733,867 €	3,075,600 €
SOROZNO CAPITAL	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**	**1,760,000 €**					
SOROZNO PENDING	**8,800,000 €**	**7,040,000 €**	**5,280,000 €**	**3,520,000 €**	**1,760,000 €**					
SOROZNO INTERES	**636,240 €**	**508,992 €**	**381,744 €**	**254,496 €**	**127,248 €**					
Social Expenses	**63,952 €**	**66,510 €**	**69,170 €**	**71,937 €**	**74,814 €**	**77,807 €**	**80,919 €**	**84,156 €**	**87,522 €**	**91,023 €**
Financial expenses	**2,396,240 €**	**5,055,170 €**	**5,269,655 €**	**5,484,140 €**	**5,698,626 €**	**4,153,111 €**	**4,494,844 €**	**4,836,578 €**	**5,178,311 €**	**5,520,044 €**
Profit or loss of the year	1,887,521 €	-518,160 €	-469,267 €	-409,838 €	-339,453 €	1,502,327 €	1,468,709 €	1,447,416 €	1,438,941 €	1,443,796 €

SOURCE: Own elaboration

11.7 Social investment first option

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Fight Against the Desertification	64,199.79	73,502.34	11,220.37	44,961.73	51,476.68	55,080.05
Society	12,839.95	14,700.46	56,101.88	44,961.73	51,476.68	55,080.05
Animals and Wildlife	8,559.97	9,800.31	44,881.50	38,538.62	44,122.87	47,211.47
Total	85,599.72	98,003.12	112,203.77	128,462.09	14,7076.25	15,7371.59

SOURCE: Own elaboration

11.8 Social investment second

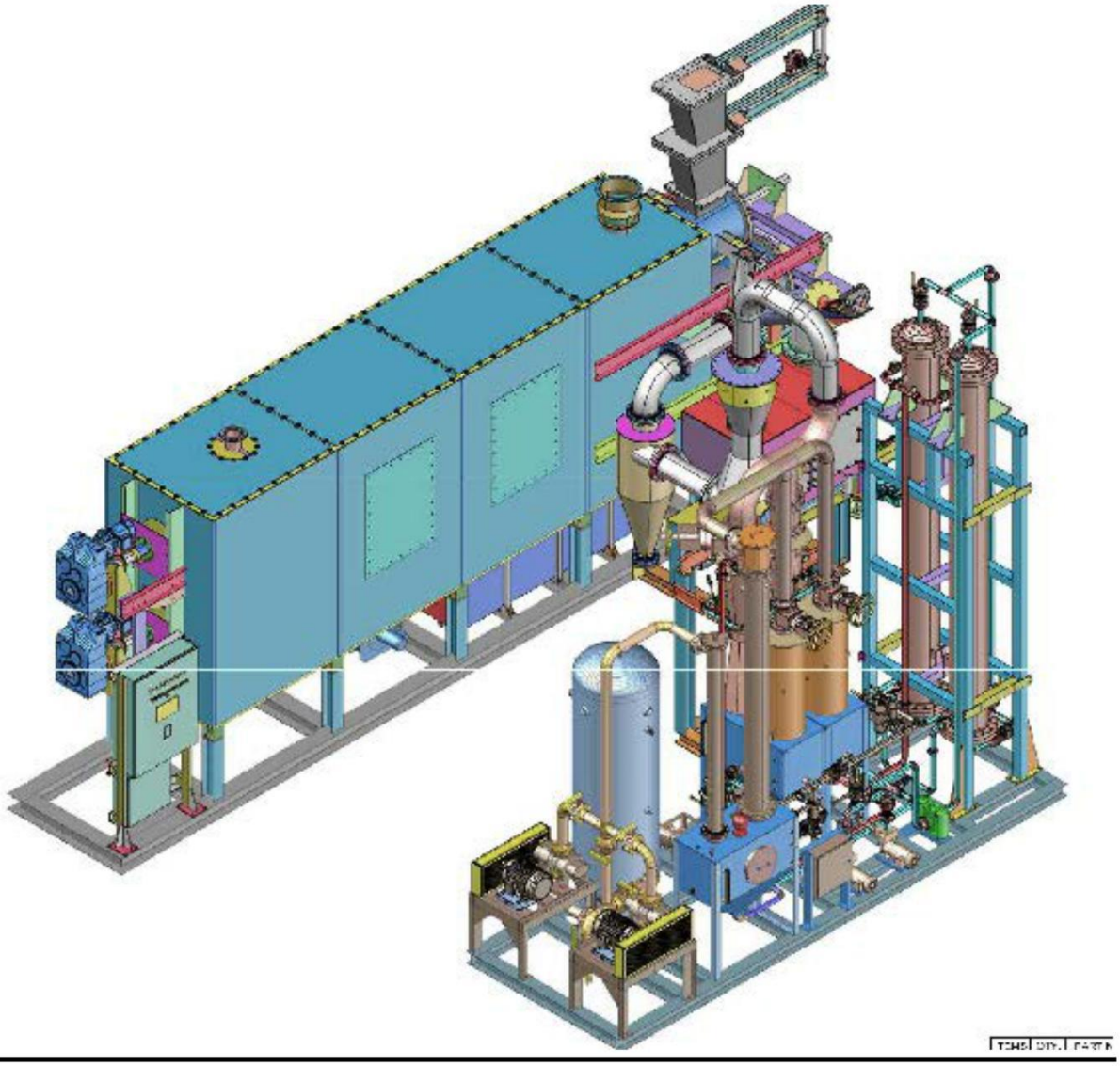
	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Fight Against the Desertification	47,963.79	52,880.07	7,773.37	29,995.49	33,070.03	34,723.53
Society	9,592.75	10,576.01	38,866.85	29,995.49	33,070.03	34,723.53
Animals and Wildlife	6,395.17	7,050.67	31,093.48	25,710.42	28,345.74	29,763.03
Total	63.951.72	70,506.77	77,733.71	85,701.42	94,485.81	99,210.10

11.9 Social investment third

	Year 1	Year 3	Year 5	Year 7	Year 9	Year 10
Fight Against the Desertification	47,963.79	51,877.63	7,481.44	28,321.76	30,632.82	31,858.13
Society	9,592.75	10,375.52	37,407.23	28,321.76	30,632.82	31,858.13
Animals and Wildlife	6,395.17	6,917.01	29,925.78	24,275.79	26,256.70	27,306.97
Total	63,951.72	69,170.18	74,814.46	80,919.32	87,522.34	91,023.23

SOURCE: Own elaboration

ARTI Process Review MSW



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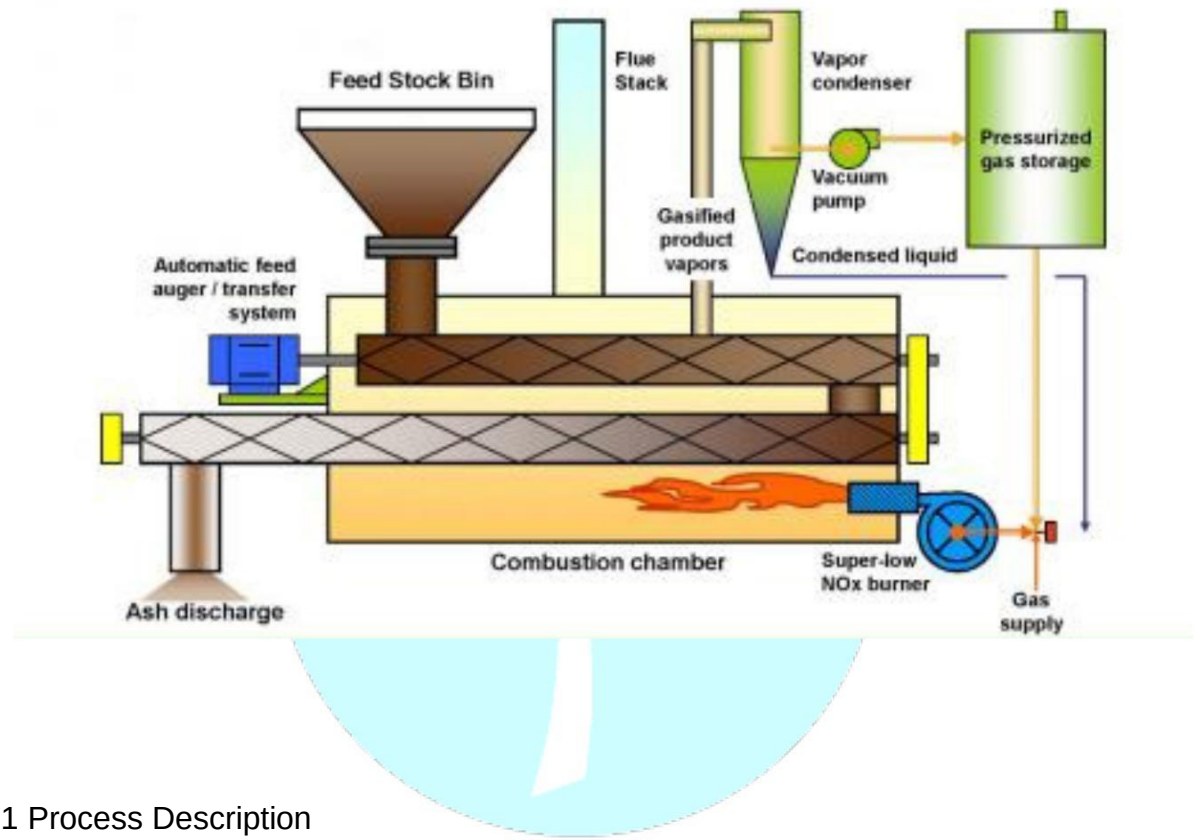
1.0 REVIEW OF THE THERMAL DISTILLATION TECHNOLOGY



1.1 Process Description

The pyrolysis demonstration unit at the site is a skid mounted. self-contained unit designed to convert waste into hydrocarbon fuels suitable for clean combustion and generation of electrical power. The unit consists of gas heated retort with internal transport augers. gas cleaning and condensing components. gas and liquid pumps. cooling tower. and a storage tank. The following components are the major parts of the pyrolytic system:

- The Furnace
- The Auger
- The Retort
- The Burner
- The Particle Wash System
- The Condenser
- The Gas Blower
- Storage tank
- The Cooling Tower

1.1.1 The Furnace:

An insulated box which contains the waste to energy retort. The retort is isolated from the furnace environment so the gases cannot leak in to the retort from the furnace. The furnace is equipped with a burner firing natural gas. The heat from the burner travels through two passes to heat the retort. The flue gas temperature should normally be 150 to 200 F above the retort operating temperature. The furnace is designed to allow the retort to easily expand and contract during the operation.

1.1.2 The Retort:

The retort is a sealed stainless steel vessel containing the two transport augers. The feedstock is manually fed to the retort via a double blade air sealed valve. This valve is installed to minimize the passage of air into the retort. The feedstock is fed into the retort when the top blade opens and allows the material to enter the valve. Once the top blade has closed the bottom blade opens to feed the material into the retort. This valve is synchronized with an auger feed into the valve. As the material travels through the retort it gasifies. The gases are collected under a slight negative pressure and sent out of the retort. As the gasification sequence of the material ends the carbon ash exits the retort through a similar double blade valve thus maintaining the slight vacuum during the discharge of this residue. In the case of AF pre shredded AF is fed into the supply bin feeding the retort. After the pyrolysis process the ash exits the retort into an ash bin. The metal from the AF is separated from the ash and is easily recovered.

1.1.3 The Augers:

The retort is equipped with high temperature stainless steel augers which move the material from the inlet. through the retort. and finally to the discharge point. These augers travel at a pre-set speed determined based on the type and characteristic of material processed. However. the speed of the augers can be changed at the Operator Control Panel to suit the changes in material processed.

1.1.4 The Burner:

The burner is manufactured by AC Technologies. Inc. and is a low emission and very efficient burner. This burner can operate at very low levels of excess oxygen if required and meet the European emission requirements. The furnace is equipped with a gas burner that is normally fueled with either natural gas or waste gas. The burner is supplied with a flame safeguard control and can be modulated to a higher firing rate on demand. A temperature control installed on the retort allows the burner to start and to modulate. Once the burner is turned on. it modulates to a firing position where it heats the retort to the pre-set temperature. When the temperature demand is satisfied the burner modulates back to its lower firing rate. If the temperature exceeds its pre-set upper limit the burner automatically shuts down. During the operation in many cases the material conversion process becomes exothermic and even though the burner has shut down the retort temperature [will remain high] may

continue to rise. If the reto temperature falls below the lower set point the burner will automatically start and raise the temperature back to the upper set point.

1.1.5 The Particle Wash System:

When the pyrolytic system is in processing mode. gases travel from the unit to the Particle Wash System (PWS). The PWS is provided with a liquid pump. The Particle Wash System must contain either light oil or water (10 to 15 gallons) depending on the nature of the process. The Wash Pump energizes as the unit starts to operate and re-circulates the washing media. This washing process takes place in a venture and any heavy particles such as tar or wax can be removed from the gas and will be retained within the Particle Wash System. A glass level indicator is supplied with the Particle Wash System. The unit must be drained from time to time to keep the level low enough for the gas to travel through. Once the gas has been cleaned through the venture it travels through the demister and liquid particles are stripped from the gas.

1.1.6 The Condenser:

A condenser is installed at the end of the PWS to make sure the lighter condensable gases liquefy through this condenser. The light liquid collects in the tank installed at the bottom of the condenser and the non condensable gases travel through a demister separating the last liquid particles before the gas reaches the gas blowers.

1.1.7 The Gas Blower:

A Gas Blower is supplied to remove the gases from the system while maintain the slight negative pressure within the system. It is a Roots-type positive displacement blower. The blower is controlled through the use of a pressure transducer installed on the retort. This transducer senses the rate of gasification.
As the gasification process gas flow changes. the retort pressure rises or falls and sends a signal to the blower speed control to compensate. In this way the operating retort vacuum is maintained at a pre-set level. This insures the quality and uniformity of the by-products.

1.1.8 Intermediate Storage Tank:

The final gas product travels to an intermediate gas storage tank. This is a small tank and cannot be used as a permanent gas storage tank. This tank must be emptied continuously otherwise it will cause back-pressure on the system.

1.1.9 The Cooling Tower:

A cooling tower is supplied to cool and re-circulate cooling water to the condenser.

1.2 System Operation:

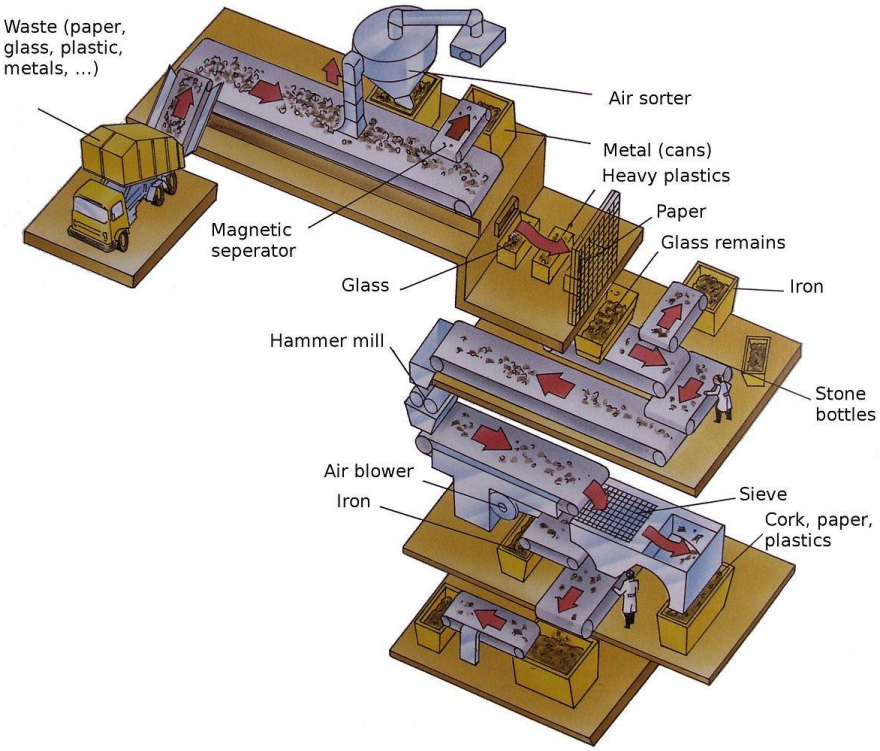
The pyrolysis system operation follows:
The burner in the furnace is started and a flame is established monitoring three important items. 1. Furnace temperature. 2. Retort temperature. and 3. Retort pressure. The retort pressure is kept at a slight negative level in inches of water column mainly between -0.5 to -2.00 “H2O”. This helps to raise the retort temperature faster and insure a safe operation. The retort temperature normally varies between 650 ° F and 1600 ° F. For pyrolyzing MSW the retort temperature is maintained between 1100 ° F and 1200 ° F. The residence time for this material is also important. For MSW the residence time is one hour and the material is kept in the retort for one hour. As the burner operates it will increase the temperature of the pyrolytic unit until a temperature of 800 ° F is reached. At this point material can be fed to the retort via the air-locked valves initiating the pyrolytic process. Once the pre-set retort temperature is reached the burner will automatically shut down. The burner will not re-energize until another pre-set burner starting temperature is reached in the ideal pre-set operating temperature. As the material begins to gasify. the gases will build a pressure which is higher than the pre-set negative retort pressure. the pressure transducer senses this change and sends a signal to the gas blower and the blower is programmed to response to this demand to bring the pressure down to the pre-set level. The gases are drawn constantly from the retort and washed out of dust. dirt and maybe some pollutants such as some sulfur compounds. Once the gas is washed. in the next two stages of operation it is important that all condensed liquids are separated from the gas using a condenser and water separators before it reaches the gas blower(s). The gas blower sends this gas to an intermediate tank at a low pressure from which it is drawn and kept in a higher pressure tank (up to 200 psig).

The condenser is cooled using a cooling tower. which re-circulates the water as a cooling media to the condenser and the gas washing heat exchanger.

Once the pyrolytic media is completely finished. the unit has to run for at least another hour in order to gasify the material that was just introduced to the unit. It is important that the furnace temperature is monitored to make sure the flame temperature does not increase beyond 2000°F.

Although the retort is manufactured using high temperature alloys. it is important that too high temperatures are avoided at all time. This will insure a long retort life.

11.11 Sorting Machine



(SLOVAKIA, June 2017)

11.12 Pelletizer Machine

(SOROZNOECO, 2016)

11.13 Protocol No. 4551/2017

EKOLAB S.P.O.

Napájadlá 17, 040 12 Košice
phone: 055/6411211, e-mail: info@ekolab.sk

Protocol No. 4551/2017

Amount of paages: 1
Order No. 1422/14

Customer:
National energetic company, Inc
Zvolenska cesta 1
974 05 Banska Bystrica

Place of collection: TARPIU, Romania

Sample/s took by: customer
Charapteristic of sample: gas

Type of collection: -
End day of the analysis: 29.8.2017

No. Sample	Name of sample	Day of collection	Delivery
6818/2014	G0002/2014	28.82017 - 28.8.2017	29.08.2017

Resault of measurement are relevant only for this analysys and they are not mentioned in other documents.
Without permission of testing laboratory can only be copied only as whole document.

Resault of measurement

Parameters	Units	No. Sample **6818/2014** Value	Uncertainty U	Working procedure according to the standard	
CO	%›	4,9	5%	N	STNEN ISO6974
CO2	%›	17.85	5%	N	STNEN ISO6974
H2	%›	18,6	5%	N	STNEN ISO6974
N2	%›	34,4	5%	N	STNEN ISO6974
CH4	%›	19,0	5%	N	STNEN ISO6974
O2	%›	3,3	5%	N	STNEN ISO6974
Ethan	%›	86,0	5%	N	STNEN ISO6974
Heat power	MJ/m^3	11,1	2%	N	STNEN ISO6974
Caloric value	MJ/m^3	9,9	2%	N	STNEN ISO6974
Ethene	%›	8,0	0,8	N	STNEN ISO6974

Executed: Ing E. Jusková

A/N: accredited/Nonaccredited test
SA/SN: accredited/Nonaccredited subs delivery
Uncertainty U - Extended uncertainty with a coefficient k=2(95%)
* - per cent measured value
Deviation of the test method: none

in Košice 14.9.2017

Ing. Eva Jusková
Head of Testing Laboratory

P41

11.14 Emission control report in Romania

Reg. No. 311/S-186

Výtlačok číslo

EMISSION CONTROL REPORT

RELEASED FROM THE PYROLYSIS PROCESS EQUIPMENT DECOMPOSITION OF THE WASTE PLACED AT THE LANDFILL SITE OF TARPI IN ROMANIA

Name of accredited testing laboratory:	National Energy Company a.s. Laboratory of Emission Measurements Zvolenská cesta 1. 974 05 Banská Bystrica IČO: 43769233

Report number:	**¡Error! No se encuentra el origen de la referencia.**	***Date:***	**¡Error! No se encuentra el origen de la referencia.**

Operating unit:	OMNIUM. Rumunsko
Customer:	VS Elektroservis. s.r.o.. Robotnícka 4334. 017 01 Považská Bystrica IČO: 44 483 180
Place/Location:	Landfill of Vitalia / Cataster of Tarpiu. Romania
Type of measurement:	Measurement of the values of the physico-chemical quantities. which express the emission limit and the values of the associated status and reference quantities directly related to the emissions of polluted waste gases and the measurement of the qualitative composition and energy content of gaseous fuels.

Order number:	25082014/01	***Date of order:***	25.08.2014

Date of measurements:	28. till 29.08.2014
The person responsible for the measurement – the head technician:	Ing. Ján Körmendy . r. narodenia 1972
Report content:	29 pages

Purpose of measurement:
Discontinuous measurement of pollutant emission values and related reference and status variables in the waste gas from a pyrolysis synthesis gas generator after its commissioning

and a verification measurement to determine the composition and caloric value of the synthesis gas produced.

Summary

Operation unit	Waste landfill near Tarpiu in Romania
Operation Time	planned operation: 24 h / day. approx. 8200 h / year. technology: emission single-mode (highest expected emissions of synthesis gas production). continuous emission steady
Soucres / devices producing emissions	1. Pyrolysis synthesis gas generator (steel exhaust at hight 10 m) 2. Technological equipment for pyrolysis decomposition of waste (flameless flame)
Measured elements	TZL. SO_2. NO_X. CO. TOC
Results	the mass concentration of the constituent in the waste gases in mg / m3. mass flow in g / h
Source number / device producing emissions	1. Pyrolysis synthesis gas generator (steel exhaust at hight 10 m) 2. Technological equipment for pyrolysis decomposition of waste (flameless flame)

Measured element	***N***	***Average value (concentration. mass flow) [mg / m ^{3}; g / h]***	***maximum (concentration. mass flow) [mg / m ^{3}; g / h]***	***Emission limit (concentration. mass flow) [mg / m ^{3}; g / h] 3)***	***Highest emission mode [yes / no] 4)***	***Warning on compliance / mismatch 5)***
Soucres / devices producing emissions			1. Pyrolysis synthesis gas generator (steel exhaust at hight 10 m)			
Operatinon time:			syngas 100%; nominal heat input			
TZL[1)]	3	2.1; 0.8	2.7; 1.0	5	Yes	**compliance**
SO_2[1)]	5	10.1; 3.8	13.1; 5.0	35. 800[6)]	Yes	**compliance**
NO_X ako NO_2[1)]	5	158; 59.9	158; 60.1	200	Yes	**compliance**
CO[1)]	5	4.5; 1.7	10.2; 3.9	100	Yes	**compliance**
TOC[1)]	5	1.7; 0.7	2.2; 0.9	-	Yes	**compliance**
Soucres / devices producing emissions			2. Technological equipment for pyrolysis decomposition of waste (flameless flame)			
PAU[2)7)]	3	*<0.001; -*	*<0.001; -*	0.05; 0.15	Yes	**compliance**

[1)] Status and reference conditions for mass concentration: 0 ºC. 101.3 kPa. dry gas. reference oxygen 3% volume
[2)] Status and reference conditions for the mass concentration: 0 ºC. 101.3 kPa. dry gas
[3)] The emission limit. the conditions of its validity set out in Annex no. 4 Section IV. Section 3.2. of Decree of the Ministry of Environment of the Slovak Republic no. 410/2012 Z.z. and for PAH as benzo (a) pyrene and dibenzo (a. h) anthracene from the 6th group of pollutants according to Annex no. 3 Part of the Decree of the Ministry of Environment of the Slovak Republic no. 410/2012 Z.z.
[4)] Mode of operation according to Annex no. 2 of Part B. item 1 of Decree of the Ministry of Environment of the Slovak Republic no. 411/2012 Z.z. measurements made in the selected production and operating mode. during which the emissions of all ZLs are the highest and the raw material parameters and the technical and

operational parameters of the production and technological separation and separation facilities are in accordance with the valid documentation. with the permit and at the same time correspond to the normal values

[5)] Requirement to comply with the emission limit pursuant to § 18 par. Article 2 a) Decree of the MoE SR no. 410/2012 Z.z.

[6)] Higher value applies to low-temperature industrial gases. for example low-caloric gas from refinery gasification. blast furnace gas. coke oven gas and mixtures thereof.

[7)] the reported average and maximum emission values are calculated on the basis of the data from the subcontractor - the analytical laboratory
N - the number of individual values of the measured emission quantities

List of abbreviations used

CO – carbon monoxide

EL – emission limit
IPP – Internal working procedure developed by National Energy Company a.s.
IM – Internal methodology prepared by National Energy Company a.s.
NO_X - nitrogen oxides. nitric oxide (NO) and nitrogen dioxide (NO2) expressed as nitrogen dioxide (NO2)
OA – sampling apparatus
PAU – polycyclic aromatic hydrocarbons - organic compounds composed of at least two fused benzene cores containing only carbon and hydrogenRIZ – riadený interný záznam
SO_2 – sulfur dioxide
TOC – volatile organic substances expressed as total organic carbon
TPP – technical-operating parameters
TZL – solid pollutants expressed as the sum of all particles
ZL – pollutant

standard situation conditions - temperature 0 ° C (273.15 K) and pressure 101.3 kPa

syngas - also synthesis gas; a mixture of combustible gases produced by the pyrolysis of organic material

Description of the purpose of the measurement

Discontinuous measurement of the emission values of pollutants (TZL. SO2. NOX. CO. TOC) and related reference (O2) and status (temperature. pressure. volume flow) quantities in the flue gases from the pyrolysis synthesis gas generator after commissioning and verification to determine the composition and caloric value of the synthesis gas (syngas) produced from the pyrolysis process decomposition equipment.

A description of the operation and the materials being processed

The principle of technology

The station for pyrolysis waste treatment is based on the thermo-chemical conversion of solid materials (communal waste) into flammable gas (syngas). It consists of a pyrolysis syngas generator. which includes a retort (two gasifier cylinders) and a gas overpressure

low emission burner (ACT-03). a particle separator. a gas scrubber. a condenser / humidifier. a pump. a gas reservoir. compressors. and a system of conveyors and pipelines. The decomposed material (crushed and compacted) is transported and fed into the retort without air access in the cycles. which ensures tight flaps at the inlet and outlet of the retort. By passing the material through the retort. where it is moved by the screw conveyors. the material is thermally decomposed by the high temperature produced by combustion of the gas on the burner. The gaseous components produced are continuously exhausted from the retort via gas purging devices under moderate vacuum by gas pumps. Purified gas is sucked out and compressed at 6 bar and transported to SYNGAS trays. The fixed components from the retort are taken to the container for further

processing. The technology is controlled by the Micro Logix 1400 Allen-Bradley controller and the LMV51 automatic burner. The entire device is a product of the American company ACT

Inc. and the design parameters are given in the following **Table of projected device parameters**

The station needs a foreign source of gas to the burner. which is propane in this case. for starting and charging the retort to the operating temperature (about 8 hours). Once the required amount of gas has been generated (syngas). the starting gas (propane) is discharged and the plant is then permanently operated on a part of its own produced gas. the remainder being combusted in a 250 kW cogeneration unit (based on the Liebherr G926 engine) it is free-burned in the field burner (flare).

Table of projected device parameters

Pol.	***Parameter name***	***Value***
1.	Input amount of waste	1 ton per hour
2.	The amount of synthesis gas produced (according to the quality of the processed material)	600 till 800 m^3/h
3.	The maximum temperature in the combustion chamber of the pyrolysis gas generator	1200 °C
4.	Maximum temperature in the retort	650 °C
5.	Operating pressure in the retorte	- 10.3 till + 10.3 kPa
6.	Maximum discharge of compressors	600 kPa
7.	Leakage pressure on field burner	580 kPa
8.	Maximum rated thermal output of a pyrolysis gas generator	110 kW

Waste gases - flue gases are drawn from the syngas generator through a steel pipeline by two exhaust fans located on the shelter of the installation through the exits at a height of 10

From the emission-technological nature of the operation. **the technology** is in accordance with the production and operating regime of the **emission one-irradiation** and according to the duration and character of the emission changes **the continuous emission stable.**

Fuel and raw materials

All raw materials with sufficient energy content - biomass. coal. plastics. rubber. sludges and other wastes of various kinds - can be processed according to the documentation. The

station is using separate. crushed and compacted municipal waste from a local landfill to produce syngas.

The pyrolysis generator produces a process gas which is composed of stable combustible gases (CO. H2. CH4) and non-flammable gases (CO2. H2O. N2). higher hydrocarbons. tar and other (small amount). According to the quality of the processed material. the caloric value of the produced gas amounts to 12.6 to 28.4 MJ / m3 with the production quantity of 600 to 800 m^3/ h.

Descripiton of place where measurement took place

The pyrolysis generator gas sampling site was formed in an equal section of the vertical section of the pipe with a constant circular cross section of 216 mm diameter behind the generator outlet and the T-piece with the exhaust fans. The existing measurement site is circular with a flange of 20 mm diameter away from the output of the 1600 mm generator (gaseous ZL and temperature measurement). At the same time. at a distance of 1000 mm above the flange. a square hole of 50 x 50 mm was created to take the TZL. Access to the measuring holes is made possible from a fixed platform to the syngas generator. the power connections are close to the measuring point up to 10 m. This measuring point was determined and listed in the measurement plan (Annex 1) in accordance with the requirements of STN EN 15259. The sampling of the syngas was carried out just behind the desulphurisation device on the existing ½ "connection. which serves to place the gas pressure sensor. The distances. the pipe dimensions and the source display with the location of the measuring points. the sampling plane and the sampling points are given in Annex no. 3

Measuring. analytical methods and equipment

Method and methodology of measurement of concentration of pollutants

Table of used operating procedures and technical standards

Measured emission element	***Name of the methodology***	***Namme of the method***	***Working procedure***
mass concentration of TZL	Air protection. Stationary sources of pollution. Determination of low weight concentrations of TZL. Part 1: Manual gravimetric method	STN EN 13284-1	IPP4 (30.5.2013)
mass concentration of CO	Air protection. Stationary emission sources. Measurement of the carbon monoxide (CO) mass concentration. Reference method: Non-dispersive infrared spectrometry	STN EN 15058	IPP1(30.5.2013)
mass concentration of NO_X	Air protection. Stationary sources of pollution. Determination of mass concentration of nitrogen oxides. Working characteristics of automated measuring systems	STN ISO 10849	
mass concentration of SO_2	Air protection. Stationary sources of pollution. Measurement of the mass concentration of sulfur dioxide. Working characteristics of automated measuring systems	STN ISO 7 935	
mass concentration of O_2	Air protection. Stationary sources of pollution. Measurement of concentrations of CO. CO2 and O2. Working characteristics and AMS calibration	STN ISO 12039	
mass concentration of TOC	Air protection. Stationary sources of pollution. Measurement of the mass concentration of total gaseous organic carbon. Continuous method with flame ionization detector	STN EN 12619	IPP9 (30.5.2013)

organic substances contained in gases	Air protection. Stationary sources of pollution. Determination of mass concentration of selected gaseous organic substances. Adsorption method on activated carbon and desorption with solvent	STN EN 13649	IPP11 (30.5.2013)
flow rate to volume flow	Air protection. Stationary emission sources. Measurement of velocity and volume flow of gases in pipelines. Part 1: Manual reference method	STN EN ISO 16911-1	IPP6 (30.5.2013)
humidity of the gas in the pipeline	Air protection. Stationary emission sources. Determination of water vapor in pipes	STN EN 14790	IPP5 (30.5.2013)
mass concentration of ZL	Air protection. Detection of time averaged emissions and emission factors. General procedure	STN EN ISO 11771	IPP6 (30.5.2013)

The number of individual measurements and withdrawals in a series at one measuring point. shown in Table no. 2. was planned in accordance with valid legislation for emission measurements used in the Slovak Republic (Annex No. 2 Part D of Decree of the Ministry of Environment of the Slovak Republic No. 411/2012 Zz).

Table of Technical operating proces of device during measurements

Device / production-operation mode			***pyrolysis***
Parameter	***Measure***	***Value of PD***	***Value (n)***
Gas pressure in front of the gas regulator	kPa	20 till 400	20 till 48
Gas pressure to the burner	kPa	0 till 10	0.5
Temperature in the retort	°C	max. 650	332 till 492
Preassure in the retort	kPa	- 10.3 till + 10.3	-38.1 till- 4.5
Temperature in the combustion chamber	°C	max. 1200	771 till 1001
Gas Gas Temperature - Part 1	°C	-	31.7 till 38.3
Temperature in the condenser	°C	-	14.4 till 15.0

Notes
The "TP value" column shows the significant TPPs listed in the documentation (2) that can be tracked during the measurement. in the column "Value (n)" of the values of the relevant TPPs recorded during the measurement

Devices for waste gas purification

There is no gas purification device behind the syngas generator. On the syngas treatment devices. the parameters listed in Table 5.1.3 above are followed. For gas temperature and condenser temperature values. the operating parameters are not listed in the documentation. and therefore no deviations of the allowed ranges have been found.

Results of meassurements

Overview of instrument measurement results

Operator:	OMNIUM. Rumunsko	***Date:***	29.08.2014
Source name:	Waste landfill near Tarpiu in Romania	***Device:***	Pyrolysis
Tim of	syngas 100%; nominal heat input		

Measurement interval	O_2 [% obj.]	NO_X[1)] [mg/m^3]	NO_X [kg/h]	CO[1)] [mg/m^3]	CO [kg/h]	SO_2[1)] [mg/m^3]	SO_2 [kg/h]	TOC[1)] [mg/m^3]	TOC [kg/h]
12:45 till 13:15	7.9	157	0.06	10.2	0.00	13.1	0.00	2.2	0.000
13:00 till 13:30	7.9	158	0.06	3.2	0.00	9.1	0.00	2.0	0.000
13:15 till 13:45	7.9	158	0.05	3.0	0.00	9.2	0.00	1.5	0.000
13:30 till 14:00	8.0	157	0.05	3.2	0.00	9.9	0.00	1.5	0.000
13:45 14:15	8.0	158	0.05	2.7	0.00	9.2	0.00	1.4	0.000
Average	7.9	158	0.05	4.5	0.00	10.1	0.00	1.7	0.000
U [%]	±	± 5.0	± 15	± 8.0	± 20	± 8.0	± 20	± 8.0	± 20

Overview of manual subscriptions results

Operator:	OMNIUM. Rumunsko	***Date:***	29.08.2014
Source name:	Waste landfill near Tarpiu in Romania	***Device:***	Pyrolysis generator
Time of operation:	syngas 100%; nominal heat input		

Measurement interval	O_2 [% obj.]	TZL[1)] [mg/m^3]	TZL [kg/h]
12:48 till 13:07	7.90	2.7	0.0010
13:15 till 13:34	8.00	1.8	0.0007
13:42 till 14:01	8.03	1.9	0.0007
Average	7.98	2.1	0.0008
U [%]	±	± 1.8 mg/m^3	± 30

Overview of manual subscriptions results

Operator:	OMNIUM. Rumunsko	***Date:***	28.08.2014
Source name:	Waste landfill near Tarpiu in Romania	***Device:***	Technology for pyrolysis decomposition odpadu

Measurement interval	O_2 [% obj.]	PAU[2)3)] / sum of all analyzed ZL/ [mg/m^3]	PAU[2)3)] / only benzo (a) pyrene and dibenzo (a. h) anthracene / [mg/m^3]
12:48 till	7.9	*0.02*	*below DL*
13:15 till	8.0	*0.00*	*below DL*
13:42 till	8.0	*0.03*	*below DL*
Average	7.9	*0.02*	*below DL*
U [%]	±	*± 20*	-

Notes

[1)] mass concentration under standard dry conditions in dry conditions and a reference oxygen content of 3% by volume
[2)] mass concentration under standard dry conditions
[3)] the reported emission values are calculated on the basis of the documents from the subcontractor - the analytical laboratory
below DL - below the detection limit (for ZL <0.001 mg.m-3)
U - relative extended uncertainty with coverage coefficient k = 2 at 95% of the statistical probability at the limit value of the specified parameter. expressed in% of the measured value. unless otherwise stated

11.15 BTU table

	kcal/kg	Fixed Carbon	Moisture	Ash	Volatiles	Btu/dry lb	kj/kg
Almond Prunings	3,058	21.54%	18.0%	1.63%	58.83%	5,500	**12,793**
Asphalt Shingles	8,339		5.0%			15,000	**34,889**
Auto Fluff	7,465	50.00%	18.0%		32.00%	13,428	**31,233**
Bagasse	4,436	14.95%	20.0%	11.00%	54.05%	7,980	**18,561**
Barley Straw	4,141	20.90%	14.0%	10.00%	55.10%	7,449	
Bamboo	3,800	20.00%	18.0%		62.00%	6,836	**15,900**
Brown coal	4,500		18.0%			8,095	**18,828**
Brown Paper	4,398	9.80%	10.0%	1.10%	79.10%	7,911	**18,400**
Cacao Shrub	3,298	24.00%	18.0%		58.00%	5,933	**13,800**
Car tires	8,300		18.0%			14,930	**34,726**
Cardboard	3,891	12.90%	18.0%	5.40%	63.70%	7,000	**16,282**
Cardboard corrugated	3,920	12.90%	18.0%	5.40%	63.70%	7,051	**16,400**
Casuarina	4,483	19.59%	18.0%	1.83%	60.58%	8,064	**18,757**
CDR	4,058	41.00%	18.0%		41.00%	7,300	**16,979**
Chicken Manure	3,780	10.30%	27.0%	15.70%	47.00%	6,800	**15,816**
China grass	4,039	20.00%	18.0%		62.00%	7,266	**16,900**
Citrus peels	4,500	20.00%	18.0%		62.00%	8,095	**18,828**
Coal	6,671	10.00%	18.0%		72.00%	12,000	**27,911**
Coal - Pittsburgh Seam	7,583	55.80%	18.0%	10.30%	15.90%	13,641	**31,728**
Coconut shell	5,984	32.00%	18.0%		50.00%	6,836	**15,900**
Coffee bean shells	6,000	10.00%	18.0%		72.00%	10,793	**25,103**
Commercial Waste	4,447	30.00%	18.0%		52.00%	8,000	**18,608**
Compost	4,207		18.0%			7,567	**17,600**
Cork	6,310	8.00%	18.0%		74.00%	11,350	**26,399**
Corn	4,398	20.00%	18.0%		62.00%	7,911	**18,400**
Corn Stover	4,405	19.25%	18.0%	5.58%	57.17%	7,924	**18,430**
Corncobs	4,483	18.54%	18.0%	1.36%	62.10%	8,064	**18,757**
Cotton gin trash	3,922	15.10%	18.0%	17.60%	49.30%	7,055	**16,409**
Cotton seeds	3,298	20.00%	18.0%		62.00%	5,933	**13,800**
Cotton Stalk	4,361	22.43%	18.0%	6.68%	52.89%	7,845	**18,247**
Cow Manure	4,725	15.00%	20.0%	13.00%	52.00%	8,500	**19,771**
Electrical Waste	7,154	21.00%	5.0%		74.00%	12,869	**29,932**
Food Waste	5,001	20.00%	18.0%		62.00%	8,995	**20,922**
Gin Trash	4,058	24.00%	18.0%		58.00%	7,300	**16,979**
Green Waste	4,070	20.00%	18.0%		62.00%	7,321	**17,028**
Hay	3,203	24.00%	18.0%		58.00%	5,761	**13,400**
Horse Manure	3,058		25.0%	4.00%		5,500	**12,793**
Hospital waste	5,473	10.00%	20.0%		70.00%	9,845	**22,899**
Household waste pre-sorted	4,500	10.00%	18.0%		72.00%	8,095	**18,828**
Human Sludge	6,671	5.00%	25.0%	35.00%	35.00%	12,000	**27,911**
King Grass	4,392	20.00%	15.0%		65.00%	7,900	**18,375**
Leather	4,169	8.00%	18.0%		74.00%	7,500	**17,445**
Lignin	5,059					9,100	**21,166**

Paper sludge	3,920					7,051	**16,400**
Macadamia shell	4,826	22.68%	18.0%	0.40%	58.92%	8,681	**20,206**
Manure (dried)	3,800		18.0%			6,836	**15,900**
Meat Waste	5,288	8.00%	18.0%		74.00%	9,512	**22,124**
Medical Waste	7,138	24.00%	18.0%		58.00%	9,845	**22,899**
MSW 5.5K	3,058	10.00%	40.0%	12.00%	38.00%	5,500	**12,793**
MSW 5K	2,780	10.00%	18.0%	12.00%	60.00%	5,000	**11,630**
MSW 6.5K	3,614	10.00%	18.0%	10.00%	62.00%	6,500	**15,119**
MSW 6K	3,336	10.00%	20.0%	12.00%	58.00%	6,000	**13,956**
MSW 7.0	3,891	10.00%	18.0%	12.00%	60.00%	7,000	**16,282**
MSW High Plastic	5,384	31.00%	15.0%	5.00%	49.00%	9,685	**22,526**
Natural Gas	8,895		18.0%			16,000	**37,215**
Neoprene	7,100		18.0%			12,771	**29,706**
Newspaper	3,920	12.20%	18.0%	1.50%	68.30%	7,051	**16,400**
Nylon	7,570		18.0%			13,617	**31,672**
Oat Hulls	3,855	16.55%	10.4%	5.22%	67.80%	6,934	**16,128**
Oil sludge	8,796		18.0%			15,822	**36,800**
Palm Oil EFB	4,048	14.00%	18.0%		68.00%	7,282	**16,938**
Pallet Wood	4,559	18.00%	20.0%	2.00%		8,200	**19,073**
Paper adhesive coated	4,207	20.00%	10.0%		70.00%	7,567	**17,600**
Paper Plastic Coated	6,816	15.00%	10.0%	2.00%	73.00%	12,261	**28,517**
Paper sludge	3,920					7,051	**16,400**
Paraffin	10,349		18.0%			18,616	**43,300**
Peach Pits	4,973	19.85%	18.0%	1.03%	61.12%	8,945	**20,806**
Peanut Hulls	4,450	21.09%	18.0%	5.89%	55.02%	8,005	**18,618**
Peat, S-H3	5,255	26.87%	18.0%	4.20%	50.93%	9,452	**21,985**
Pig Manure	4,466	12.00%	25.0%	25.00%	38.00%	8,034	**18,687**
Pineapple Waste	4,194	10.00%	10.0%	0.05%	79.95%	7,544	**17,547**
Plastic Roll	6,500	0.02%	1.46%	0.03%	98.49%	21,000	**48,845**
Plastics	7,758	1.46%	5.0%	2.00%	91.54%	15,000	**34,889**
Polyethane foam	9,770	5.00%	5.0%	3.00%	87.00%	17,574	**40,877**
Polyethylene	10,990	15.00%	5.0%	3.00%	77.00%	19,769	**45,981**
Polypropylene	11,030		5.0%	3.00%		19,841	**46,148**
Polystyrol carbon	10,480	30.00%	5.0%	3.00%	62.00%	18,851	**43,847**
Polystyrol EPS	9,800	30.00%	5.0%	3.00%	62.00%	17,628	**41,002**
Railroad Ties	4,447	20.00%			80.00%	8,000	**18,608**
RDF	6,006	41.00%	15.0%		44.00%	10,804	**25,128**
RGEN MSW	4,308	15.00%	15.0%	5.00%	65.00%	7,750	**18,026**
Rice Hulls	3,555	10.00%	10.0%	17.90%	62.10%	6,395	**14,874**
Rubber (Crum	7,500	33.00%			67.00%	13,491	**31,379**
Sewage sludge (dried)	3,298					5,933	**13,800**
Soybean Waste	4,169	20.00%	18.0%		62.00%	7,500	**17,445**
Sudan Grass	4,154	18.60%	18.0%	8.65%	54.75%	7,471	**17,378**
Sugar Beets	3,242	20.00%	18.0%		62.00%	5,831	**13,563**
Sugar Cane	6,810	10.00%	18.0%		72.00%	12,250	**28,493**

Sugarcane Bagasse	4,500	14.95%	18.0%	11.27%	55.78%	8,095	**18,828**
Sunflower Staple	4,300	10.00%	10.5%	7.60%	71.90%	7,735	**17,991**
Sunflower Seeds	4,559	8.00%	18.0%		74.00%	8,200	**19,073**
Switchgrass	4,503	21.00%		6.00%	73.00%	8,100	**18,840**
Tar acid	5,600	2.08%			97.92%	10,073	**23,430**
Tar and refinery residues	9,200	4.00%			96.00%	16,549	**38,492**
Tar paper	6,390	1.22%			98.78%	11,494	**26,735**
Textiles	3,500	10.00%			90.00%	6,296	**14,644**
Tire Chips w/o steel	7,500	35.00%		5.00%	60.00%	13,491	**31,379**
Tire Chips w/steel	7,500	32.00%		10.00%	58.00%	13,491	**31,379**
Tobacco powder	3,012	10.00%			90.00%	5,417	**12,600**
Turkey Manure	3,429	1.22%			98.78%	6,168	**14,346**
Walnut Shells	4,820	21.16%		0.56%	78.28%	8,670	**20,166**
Waste Oil	8,895	2.43%			97.57%	16,000	**37,215**
Waste Paper	3,891	10.00%	15.0%		75.00%	7,000	**16,282**
Wheat Straw	4,182	19.80%	12.0%	8.90%	59.30%	7,523	**17,498**
Beech	4,868		15.0%	0.65%		8,756	**20,366**
Blackhills Pine	4,868	11.41%	6.3%	0.48%	81.77%	8,319	
Black Locust	4,708	18.26%	15.0%	0.80%	65.94%	8,468	**19,696**
Black Walnut Prunings	4,736	18.53%	18.0%	0.78%	62.69%	8,520	**19,816**
Cedar	4,700	21.00%	15.0%	2.00%	62.00%	8,454	**19,664**
Digested Sludge	3,280	10.00%	18.0%		72.00%	5,900	**13,723**
Douglas Fir	5,028	13.70%	15.0%	0.80%	70.50%	9,044	**21,035**
Douglas Fir bark	5,278	25.80%	15.0%	1.20%	58.00%	9,495	**22,085**
Eucalyptus	4,638	17.82%	15.0%	0.76%	66.42%	8,344	**19,407**
Gmelina	4,753	18.00%	15.0%		67.00%	8,550	**19,887**
Hickory	4,818		15.0%	0.73%		8,666	**20,156**
Hybrid Poplar	4,661	18.00%	15.0%		67.00%	8,384	**19,501**
Madrone	4,660	16.44%	15.0%	0.57%	67.99%	8,382	**19,496**
Mango Wood	4,579	11.36%	15.0%	2.98%	70.66%	8,236	**19,157**
Maple	4,767		15.0%			8,576	**19,946**
Pine needles	4,806	26.12%	18.0%	1.50%	54.38%	8,644	**20,106**
Plywood	4,529	15.77%	5.0%	2.09%	77.14%	8,146	**18,947**
Ponderosa Pine	4,782	17.17%	15.0%	0.29%	67.54%	8,601	**20,006**
Poplar	4,629	16.35%	15.0%	1.33%	67.32%	8,326	**19,367**
Red Alder	4,610	12.50%	15.0%	0.40%	72.10%	8,292	**19,287**
Redwood	4,800	16.10%	15.0%	0.40%	68.50%	8,634	**20,083**
Salt Cedar	5,392	22.00%	40.0%		38.00%	9,700	**22,562**
Sycamore	4,715	19.21%	15.0%	0.67%	65.12%	8,481	**19,726**
Treated wood	4,500	1.23%			98.77%	8,095	**18,828**
Western Hemlock	4,789	15.20%	15.0%	2.20%	67.60%	8,614	**20,036**
White Fir	4,765	16.58%	15.0%	0.25%	68.17%	8,571	**19,936**
White Oak	4,638	17.20%	15.0%	1.52%	66.28%	8,344	**19,407**
Wood Pellets	4,683	18.00%	15.0%	1.40%	65.60%	8,424	**19,593**
Loblolly Pine bark	5,202	44.90%	15.0%	0.40%	39.70%	9,357	**21,765**

11.16 Machinery working in Europe

SoroznoEco

VS Elektroservis SLOVAKIA

REFERENCES

VS ELEKTROSERVIS & SoroznoEco

No.	Place	Capacity			Years of operation and exploitation	Note
		Sort	Power	Gas production		
1	BIOMASS POWER PLANT FILAKOVO, Slovakia	Biomass and MSW (future)	1MW	600-800 m^3 per hour	Since 2015, 8000 tons per year	Main contractor ARTI + VS Elektroservis Slovakia
2	OMNIUM, Romania	MSW and tires	1MW	600-800 m^3 per hour	Since 2013, 8400 tons per year	Main contractor ARTI + VS Elektroservis Slovakia
3	ARUBA, Caribbean Sea	MSW	- (only gas)	1950 – 2600 m^3 per hour	Since 2014, 26000 tons per year	Technology supplier ARTI + VS Elektroservis Slovakia
4	BEYPAZARI, Turkey	Chicken manure	2MW	1200 – 1600 m^3 per hour	Since 2014, 12600 tons per year	Technology supplier ARTI + VS Elektroservis Slovakia
5	BUDEJOVICE, Czech Republic.	Wood pellets	1MW	600-800 m^3 per hour	Since 2016, 8000 tons per year	Technology supplier ARTI + VS Elektroservis Slovakia

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