Cavalcom

Wastes to Energy

The Company

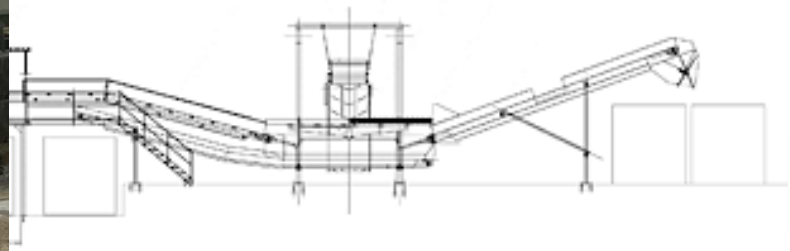
Cavalcom SRL. established in 1995, an R&D group of specialized engineers, headed by Dr. Moshe Tabolsky.

The Company masters the technology of converting organic materials into energy / electricity.

Within that framework the Company offers solutions to the disposal of municipal, agricultural, and industrial organic waste. These solutions provide for the disposal of hard core organic waste (like tiers) arriving at exceptionally large, and economically feasible quantities of syngas, liquid fuels, and electricity in that process.

The Technology

Having been tested in laboratory experiments and at a beta site the new technology was recognized as “**green energy**” by the **SGS** authorities in 2007 and was registered as a recognized patent. Our system provides for an environment-friendly disposal of organic waste, employing an innovative process converting organic material into usable fuels, and electricitry.

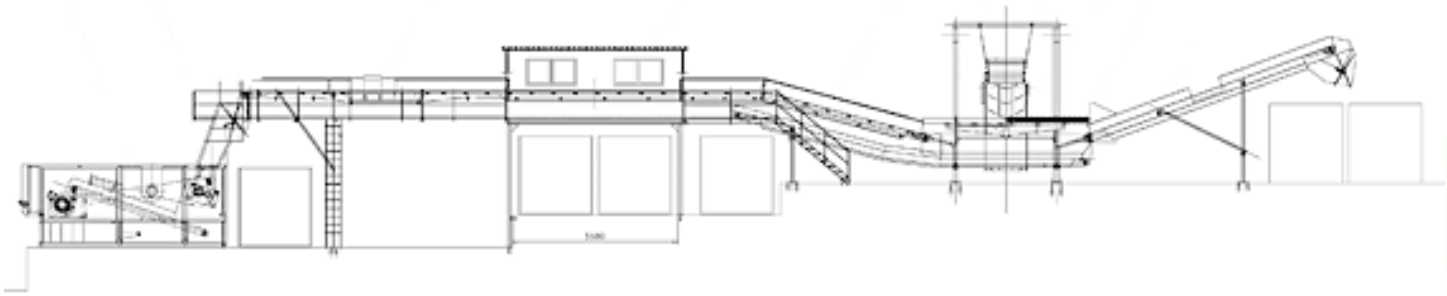


Process

Pretreatment: organic materials are pretreatment by content, texture and origin. For example, tires are shredding, solid urban waste is separated into glass, metal objects etc., by using sorting line system sludge is being dehydrated.

Please see link of a semi automatic sorting line in Bulgaria:

http://www.youtube.com/watch?v=E_d8c9GMu8k



Inflows and Outflows

Raw Material:

The system is exceptionally flexible, capable of treating variable mixtures of a wide range of organic materials, including municipal, farm and industrial organic dry waste and sludge.

Leading Usable Output:

The process renders syngas, diesel-oil, and steam.

By-products:

Solid materials containing nitrous, sulphuric and, sometime, phosphoric compounds, captured from the acid gases.

Solid Waste:

Residual ash contains minimal quantities of solids like lead, mercury, copper etc.. Concentrations are adjustable, not to exceed accepted standards in the Plant vicinity.

The Process

Gas Emission:

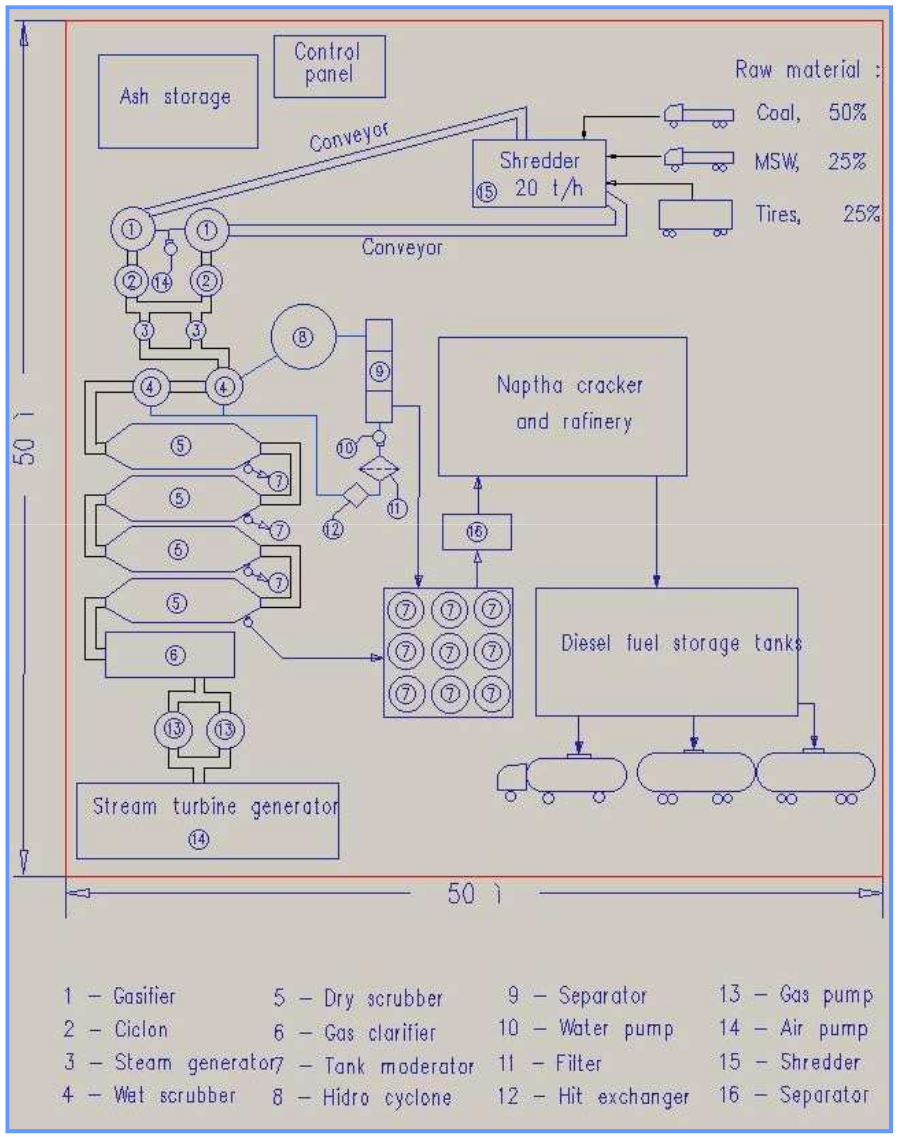
Vapour emitted into the atmosphere, consisting of inert nitrogen (N2), water, carbon dioxide and methane, is free of acid gases (Nitrous and Sulphuric Oxides).

Pre-treatment:

Organic material is pre-treated according to content, texture, and source. For example, tires undergo shredding; solid municipal waste is set free of glass, metallic objects, etc; sludge is being dehydrated.

High Temperature Reactor:

Treated organic waste and (optionally) lignite is conveyed into a high temperature reactor. The output consists of Cox and raw material of light fraction diesel-oil. That raw material is fed into a hydrogenation facility. Cox is directed to a ball mill and then a gasifying facility.

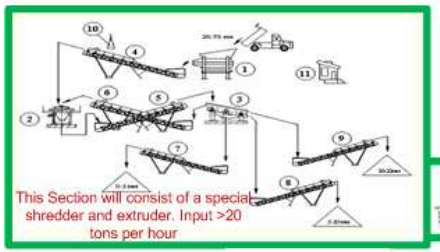

Control panel
Ash storage
Raw material :
Coal, 50%
MSW, 25%
Tires, 25%
Conveyor
Shredder
⑮ 20 t/h
Conveyor
Naptha cracker and rafinery
Diesel fuel storage tanks
Stream turbine generator
⑭
50 ì
50 ì
1 – Gasifier
2 – Ciclon
3 – Steam generator
4 – Wet scrubber
5 – Dry scrubber
6 – Gas clarifier
7 – Tank moderator
8 – Hidro cyclone
9 – Separator
10 – Water pump
11 – Filter
12 – Hit exchanger
13 – Gas pump
14 – Air pump
15 – Shredder
16 – Separator

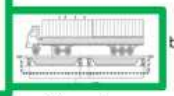
Hydro Generator:
Breaking up long chains into small simple molecules, and separating sulphuric, nitrous and other by products from the usable output, this facility produces diesel-oil. Characterized by low freezing point and low viscosity, diesel-oil is piped or tank-transferred to a distillery and other end customers.

Gasifying Facility:
Fine grounded Cox is directed to this fluid-bed generator converting Cox into syngases. Out-flowing gases are directed to scrubbers and compressors.

Scrubbers and Compressors and Power Supplier:
Methane and hydrogen gases processed by these facilities provide the fuel for a gas turbine which, assisted by heat converters, is the system's only power supplier. Surplus gas is delivered to end customers.

Thermolyte Flow Chart
20 ton per hour optimized for Cassava Stalks, Stems and Eucalyptus Trunk





100 ton weigh bridge with direct connection to automation

22 N2

N2, CO2

Water Filter with Calcium

21

Synthesis column

Steam 21 t/h

Diesel (80%) +benzine (20%)

19

20

10 Cer… Blower

11 Water Filter with Calcium

Packing Machine Gypsum)

dry matter

18

600-700 t° 0 C

13-15 Temperature Measuring points

Air 23

900-1200° 0 C

burning zone

1 2 3 4 5 6 7 8 9

Steam Generator

Steam 6 t/h

12 15 16 17

Venturi Scrubber

Dry Scrubber with Raschig Rings

Oil Scrubber

13 14

C… Casings)

Steam f or Gasifier

Steam from Refinery

Main Gasifiers (2) of 10 tons p… hour each

dry matter

Packing Machine for Fly Ash

Wire separator for tires

dry matter

6 MW

Diesel Generators or Steam turbine

Waste hydrocarbon after refinery

K-2 E-2 B-1 B-2 ABO2 E-3 E-1 K-1 ABO1

Diesel

19

The side view shows the output stream from one gasifier
This stream is repeated for the second gasifier
with some equipment used in common (marked in green)

Orange = Gas Stream
Black = Hydrocarbons
Blue= Steam
Red = Electric Power
Brown = Diesel output

The situation

Disposing organic solid waste or sludge by incinerating is a leading procedure in the disposal of municipal and agricultural garbage.

Europe, the United-States as well as developing countries use large amounts of energy in order to treat the excess amounts of all sorts of waste.

The authorities learned out that the traditional methods of garbage treatment are not suitable any more for the huge amounts of the waste in the modern world.

At the same time some technologies of extracting energy from waste are researched intensively, funded by governments, particularly in USA.

But these technologies are very inefficient thus not being feasible from an economic point of view.

The feasibility of a plant relying on this technology can be manifested, in principle, through plans for a much larger project, up to 20 megawatt per hour.

A major issue regarding large plants concerns the need to get enough amounts of raw material, for instance, 400 tons per day of municipal waste (60% dry material) or 1,200 tons per day of sewage sludge (20%).

The project will have two main sources of income: Receipts from the sales of Energy and receipts from municipalities due to the disposal of their ordinary waste.

For them this will be an alternative to costly delivery and disposal at distant sites.

The big advantage of this new technology is its ability to produce diesel oil or synthetic gas and electricity from ordinary waste and the process is effective and affordable.

Energy conversion facility was built in Moldova in 2004. The facility produces energy equivalent to one megawatt of electricity per hour. After three years of production, the project on the verge of reached break-even point.

The same technology was used to a larger project in Taibe, Israel with a capacity of 20 MW per hour.

Feasibility testing of the facility shows that the technology can be applied to larger-scale modular facilities of 1 tons / hr produce one megawatts / hour. To 50 tons per hour.

The facility

http://www.youtube.com/watch?v=JW0Tg2VoJXc

Cyclones

Conveyor for raw material submission.