Franbec eda ltée

Few facts about Thermocycling® plants and GASOSYN® thermal reactor.

A Thermocycling® plant is an assembly of numerous technologies to transform in ENERGY, all type of BIOMASS, among which are the garbages, now known under the name **M**unicipal **S**olid **W**astes or **MSW**. Commercial, institutional and industrial organic wastes can also be used as feedstock to be transformed in ENERGY.

Our reactor named **GASOSYN®** can transform **25 wet tons per hour** of **MSW** in Hydrogen ($\mathbf{H_2}$) and Carbon oxide (CO). A **Thermocycling® plant**, with **one GASOSYN®** can process up to 210 000 tons of feedstock. A **Thermocycling® plant** can use multiple **GASOSYN®** reactors to satisfy the needs of an area for 420 000, 630 000, 840 000 tons a year or more.

Energy produced in a Thermocycling® plant can be: for **ONE TON OF MSW**:

1- Electricity; 1 000 KW = 1 MegaWatts (MW);
2- Ethanol; 400 litres = 2,5 barrels;
3- Drop-ins fuels; 350 litres = 2,2 barrels;
4- Pure Hydrogen and Carbon Oxide for petrochemical uses, 800 kg of CO and 90 kg of H_2.
5- Steam alone; saturated 100°C, 4 000 kg;

Only a feasibility study for the area can determine which will be the end product from which input.

Whatever the main energy produced, a **Thermocycling® plant** has always other benefits. The residual heat can be used to produces additional steam for industrial uses or for electricity generation with steam turbine, adding to the output of the plant after internal uses deduction.

When seawater is available we like to use the residual heat to produce potable water by distillation. That water can also be bottled and sold on the international market. Water is and will be more valuable than the petrol on the market; with the water, we can make more money than with the main energy produced. Besides above energy produced, 1000 liters of distillate water is produced with the treatment of ONE (1) ton of municipal waste (**MSW**), a real extra benefit.

We can also process the wastewater of a city, we can distillate the water and recycle it for irrigation and industrial uses. The distillate water from wastewater, even as clean as the seawater, is normally not used as potable water. The sludge is directed to the **GASOSYN®** to be heated at ultra high temperature and cracked in SYNGAS (CO and H_2) to be used in energy processes.

In industrial countries, we can have about 1 ton of MSW by inhabitant. So a city, or a region, with 210 000 persons produces about 210 000 tons of Municipal Solid Waste (**MSW**) and feed a **Thermocycling® plant** using one (1) **GASOSYN©** having a capacity of 25 tons an hour, for 8 400 hour of operation by year.

Besides producing energy and using residual heat to produce clean distillate for drinkable water we can get CARBON CREDIT.

One ton of **WSW** can give access to 3,3 Carbon credit equivalent CO_2, when feedstock is 100% renewable BIOMASS, we can get more than 6 credits for each ton processed. At projected price for, after 2012 of 20,00 $ US, we can get up 120,00 $ US dollars for each ton of BIOMASS processed in a **Thermocycling® plant.**

Gasification of biomass is a known process since many years. Gasification is used extensively in Europe and JAPAN for garbages (MSW), but reactors are majority processing maximum 5 tons an hour, which is too small to be really effective. We have a reactor, the GASOSYN®, able to process 25 tons an hour which is a reasonable range. It can be fabricated in a mass production plant, lowering manufacturing costs. Standardisation leads to fast repair and good supply of spare parts at low costs.

Expected revenues from a Thermocycling© Plant.

When tipping fees are available to divert **MSW** from Landfilling and using them for **Green Energy** production, a **Thermocycling© Plant** can have multiple sources of revenues. For **1** tons of **MSW:**

- Tipping fee of up to: 50,00$
- **GHG** credits sold at 15,00 x 3,333 = 50,00$
- Extra bottled water at 0,10$ a liter 1000 x 0,10$ = 100,00$
- Electricity at 0,10$ a kilowatt, 1000x0,10 = 100,00$
- TOTAL revenues for ONE (1) ton of MSW 300,00$

The net expected profit of a **Thermocycling© Plant is 35% a year.**

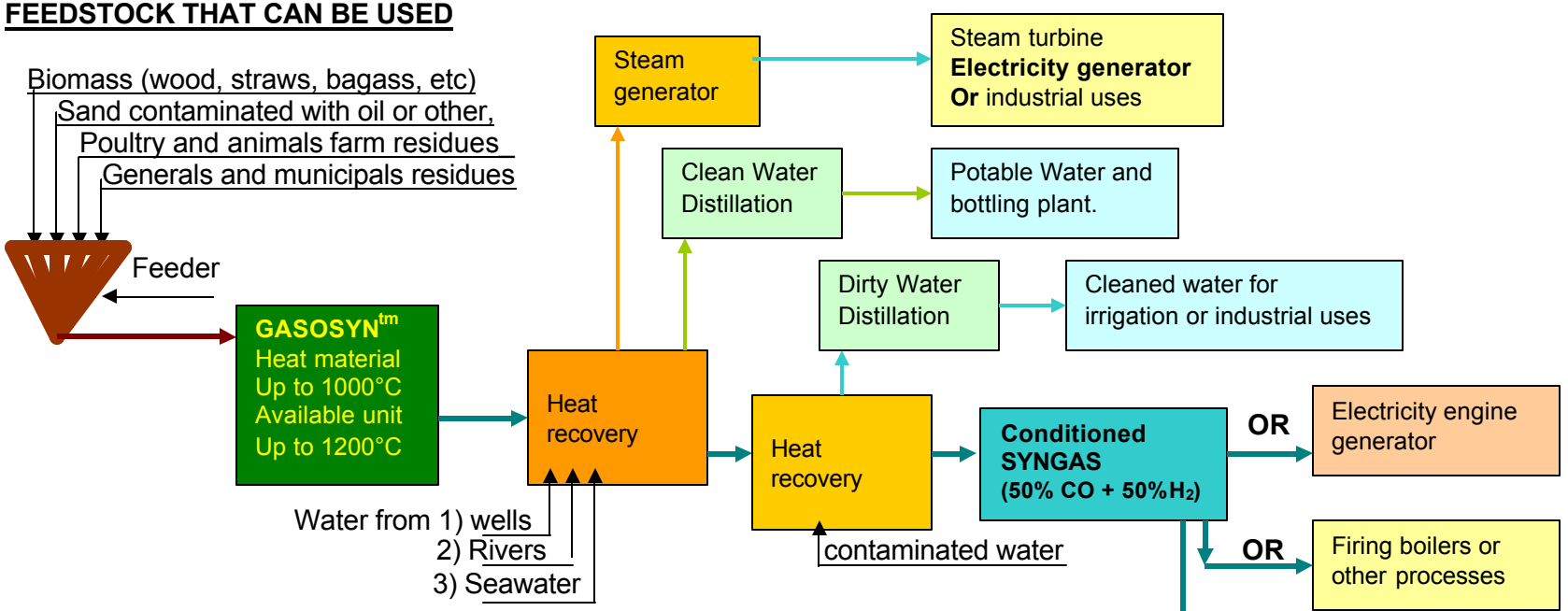
Franbec eda ltée

Rejean Chouinard President

Franbee eda ltée

General description of a **Thermocycling^{tm} Plant** with a **GASOSYN^{tm}** vapocraker reactor.

FEEDSTOCK THAT CAN BE USED



Available sizes of **Thermocycling^{tm}** Plant

INPUT at feeder in metric Ton One ton of organic = 800 KW to 1 500KW depending on composition

ONE (1) ton/hour - 8 000 tons a year
FIVE (5) tons/hour - 40 000 tons a year
TEN (10) tons/hour - 80 000 tons a year
TWENTY (20) tons/hour - 160 000 tons a year (30MW/h of electricity **or** 40 barrels of oil an hour available)

A reforming plant can be supplied when 20 tons/hours or more are available

For safety and load swings, 2 or 3 units on each plant should be used.

Excellent flexibility in configurations available.

Feasibility study needed for each project.