

*Intelligent Plasma Solutions for
Waste Management*

High Temperature Technologies Corp.



**Plasma furnace
PP-1000**

HTT Proposal product



TECHNICAL SPECIFICATIONS

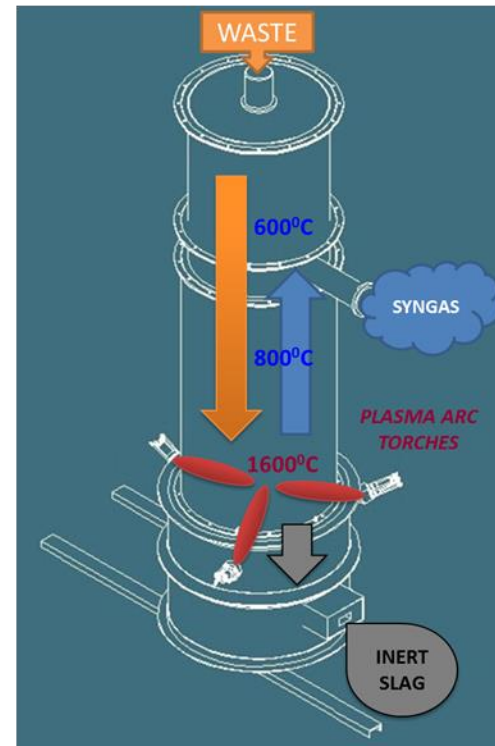
We are proud to propose to you Plasma Furnace PP-1000 for treatment of Organic Waste with productivity of up to 1000 kg per hour (24 ton per day). The furnace has three-six plasma arc torches PPT-150AC/PPT-300DC with general capacity up to 900-1600kW. The plasma furnace can not only environmentally destroy the harmful / hazardous waste but and is allows to recover synthesis gas and inert slag in the treatment process of waste and use extracted products for different purposes.

№	Item	Value
1	1. Productivity, kg per hour	1000
4	Number of plasma torches	3-6
3	3. The plasma torch power, kW	150-300
4	4. Temperature plasma jets, °C	4000-5000
5	4. Temperature in the reactor core, °C	1700
6	5. The total installed power, kW, no more	900-1500
7	6. Cooling system (Water, reverse, dual), nm3/h, no more	30
8	7. Air flow, nm3/h, no more	1700
9	8. Waste used for treatment	Organic waste: MSW, plastic, wood, medical waste etc.
10	9. Relative humidity of waste, %	20-30

Furnace PP-1000

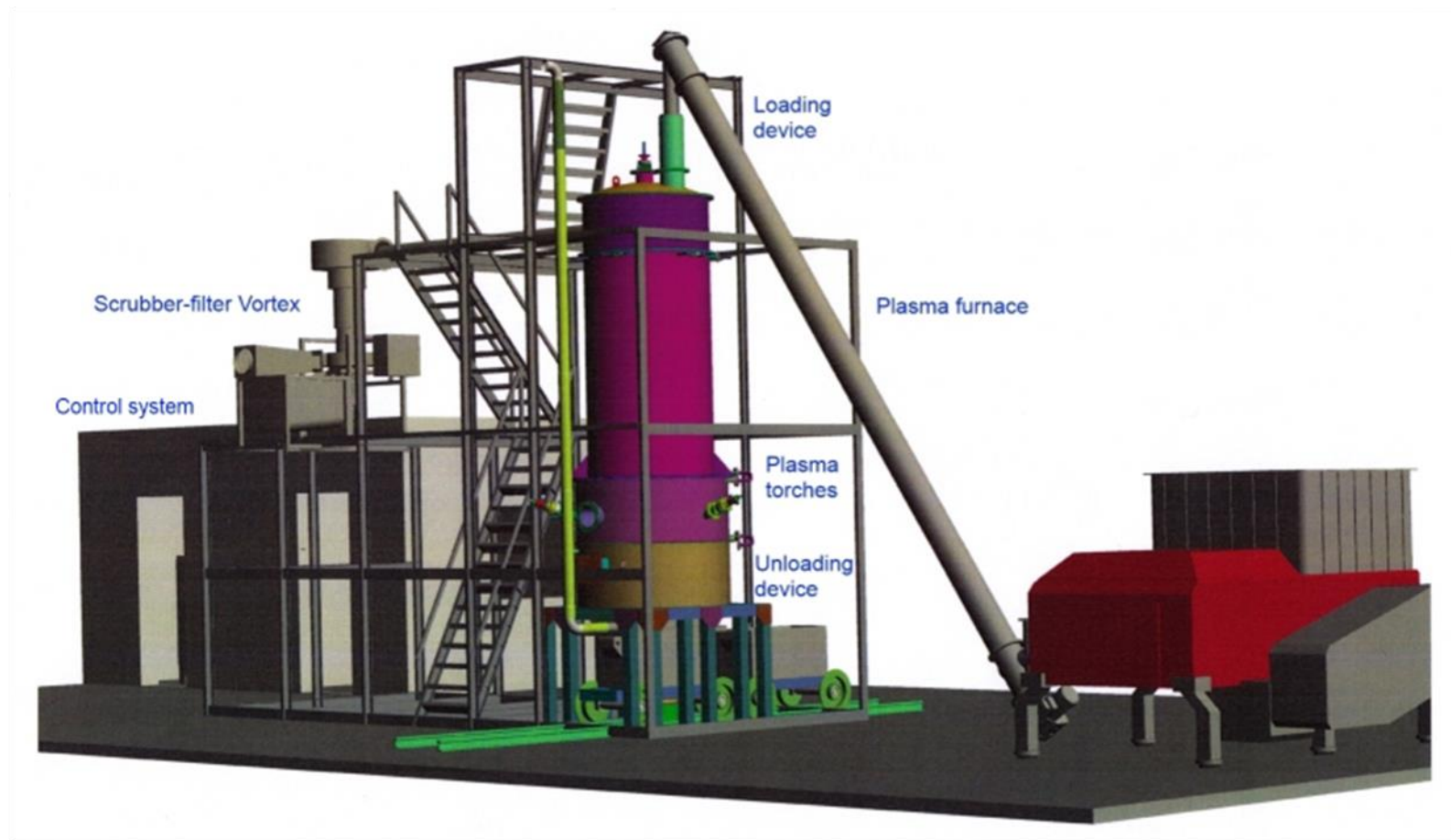
Characteristics:

- Capacity: 1000kg per hour
- Power: 840-1420kW*
- Three-six Plasma Torches
- Furnace size: 1.5x1.5x7 m
- Area: 200-300m²
- Furnace Control system
- Air Emissions Control CO₂, NO_x,
- By-products: Heat, Syngas, Inert slag

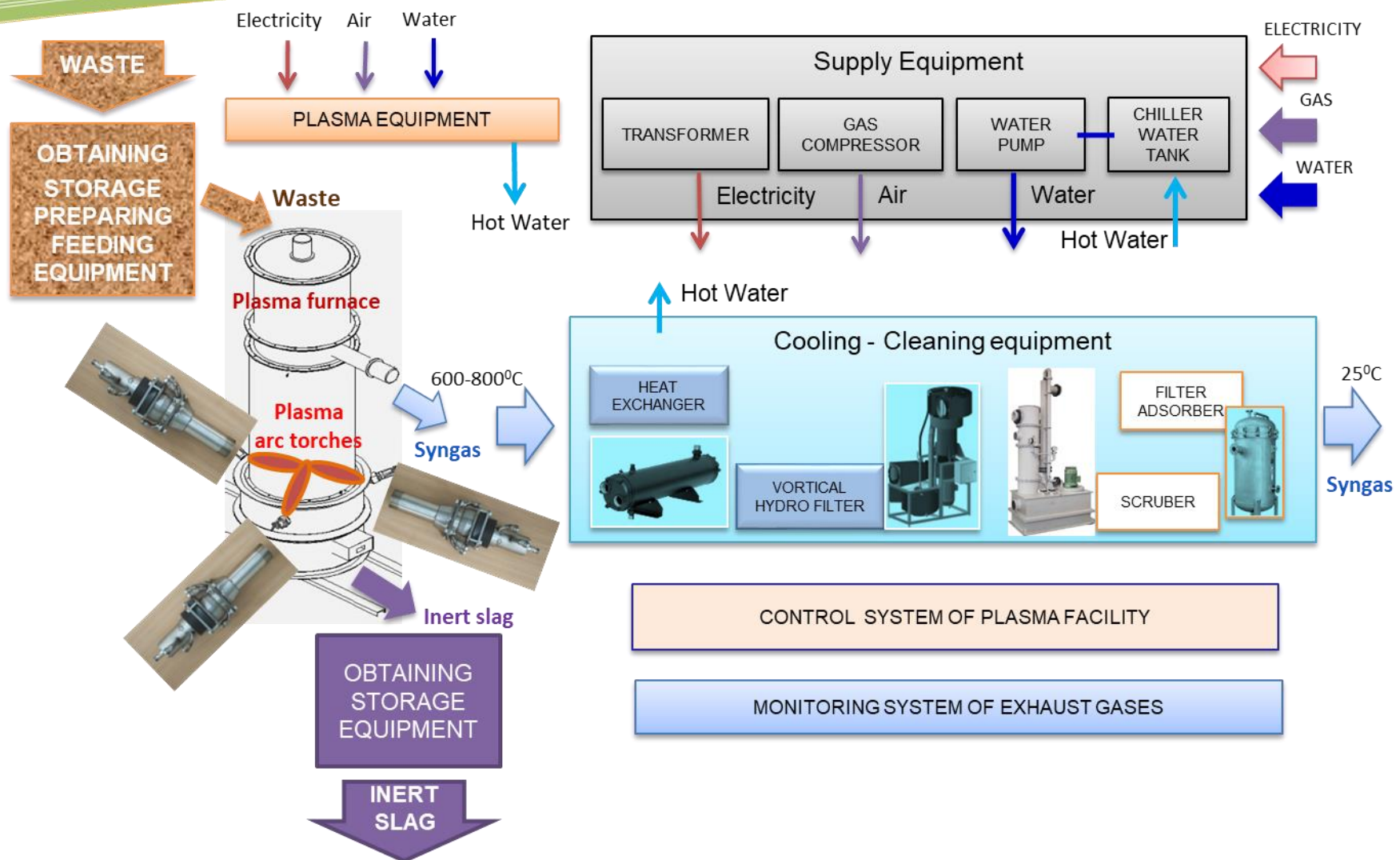


* Can be confirmed only during the pre-design with test of waste

Scheme of the plasma furnace



Structure of the plasma facility with one plasma furnace

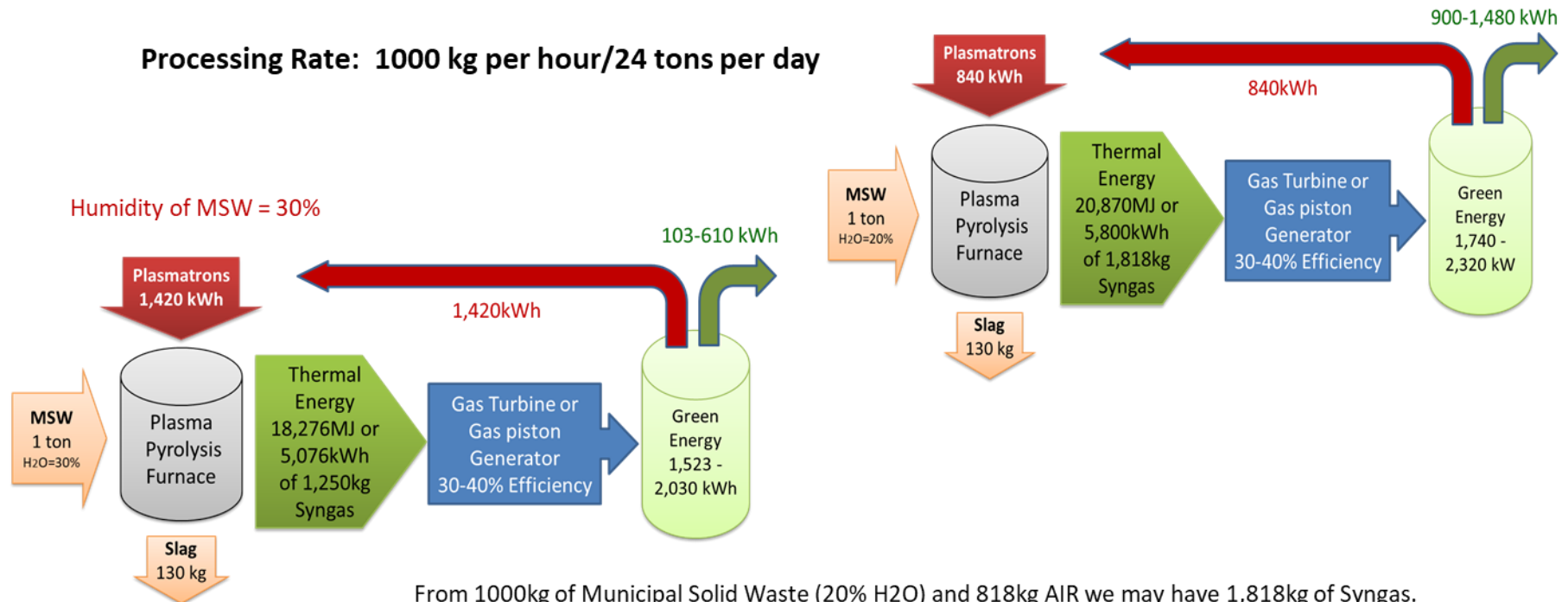


Mass Energy Balance



Humidity of MSW = 20%

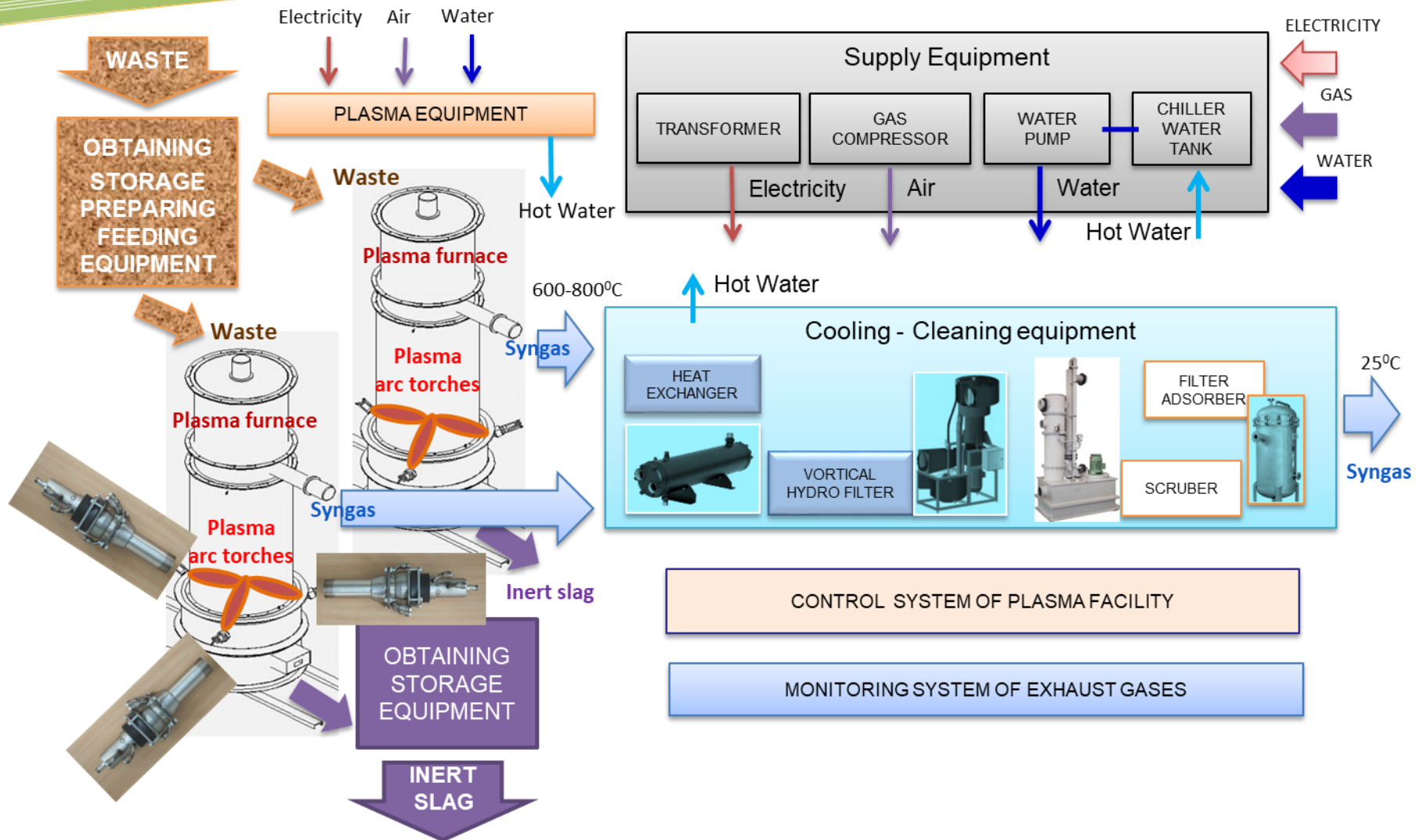
Processing Rate: 1000 kg per hour/24 tons per day



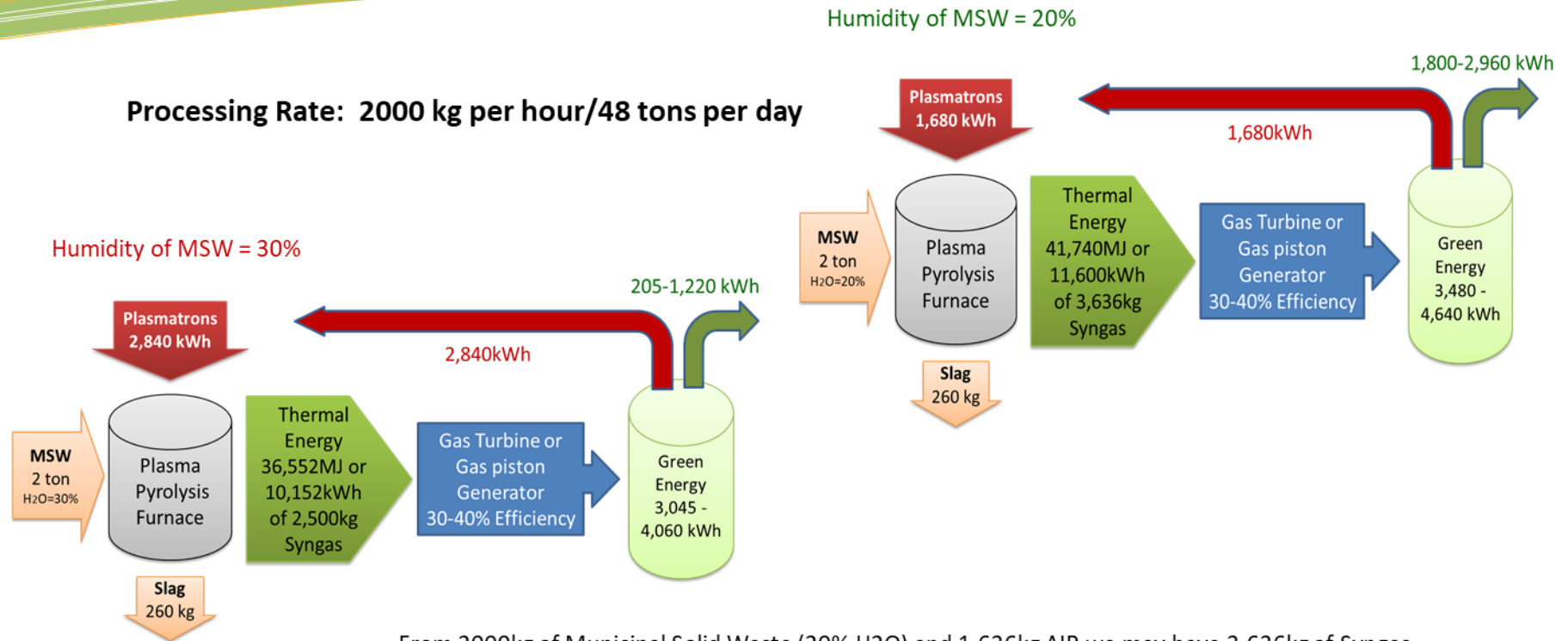
From 1000kg of Municipal Solid Waste (20% H_2O) and 818kg AIR we may have 1,818kg of Syngas.
From 1000kg of Municipal Solid Waste (30% H_2O) and 250kg AIR we may have 1,250kg of Syngas.

Waste		Fuel	Composition % (mass)			Heating Value	
Amount	Humidity	Syngas	CO	H ₂	Other (N ₂ +CO ₂ +H ₂ O+SO...)	MJ/kg	kW/kg
1000kg	20%	1,818kg	53.8	4.0	42.2	11.48	3.19
1000kg	30%	1,250kg	56.4	6.0	37.6	14.62	4.06

Structure of the plasma facility with two plasma furnace



Mass Energy Balance



From 2000kg of Municipal Solid Waste (20% H₂O) and 1,636kg AIR we may have 3,636kg of Syngas.
 From 2000kg of Municipal Solid Waste (30% H₂O) and 500kg AIR we may have 2,500kg of Syngas.

Waste		Fuel	Composition % (mass)			Heating Value	
Amount	Humidity	Syngas	CO	H ₂	Other (N ₂ +CO ₂ +H ₂ O+SO...)	MJ/kg	kW/kg
2000kg	20%	3,636kg	53.8	4.0	42.2	11.48	3.19
2000kg	30%	2,500kg	56.4	6.0	37.6	14.62	4.06

Terms of creation and servicing



Terms of creation for the plasma furnace

- Term of technical requirements, **technical plan** – 1 month
- Term of **pre-design works with test of waste** – 2-3 months
- * Specification of structure and characteristics of the equipment, corrections of **Technical Plan**
- Term of **design works of full plant**, technical documentation of installation – 3-4 months
- Term of **manufacturing** of the **plasma equipment**, test run – 10-12 months
- Term of **delivery** of the equipment – 1 month
- Term of supervision of **installing, commissioning**, test run – 2-3 months

Servicing of plasma furnace

Plasma equipment will require the basic servicing. This will include periodic electrodes replacing in the plasma arc torches and overall periodic check-ups of the reactor. The replacing of electrodes with rubber seals will take around 3-4 times per month (for operation 24 hours a day) with duration of each replacing around 40 minutes. The periodic check-ups of the reactor will take around one - two times per year (for operation 24 hours a day) with duration of each check-up around one-two day.

Servicing staff:

Two Technician and one Electrician.