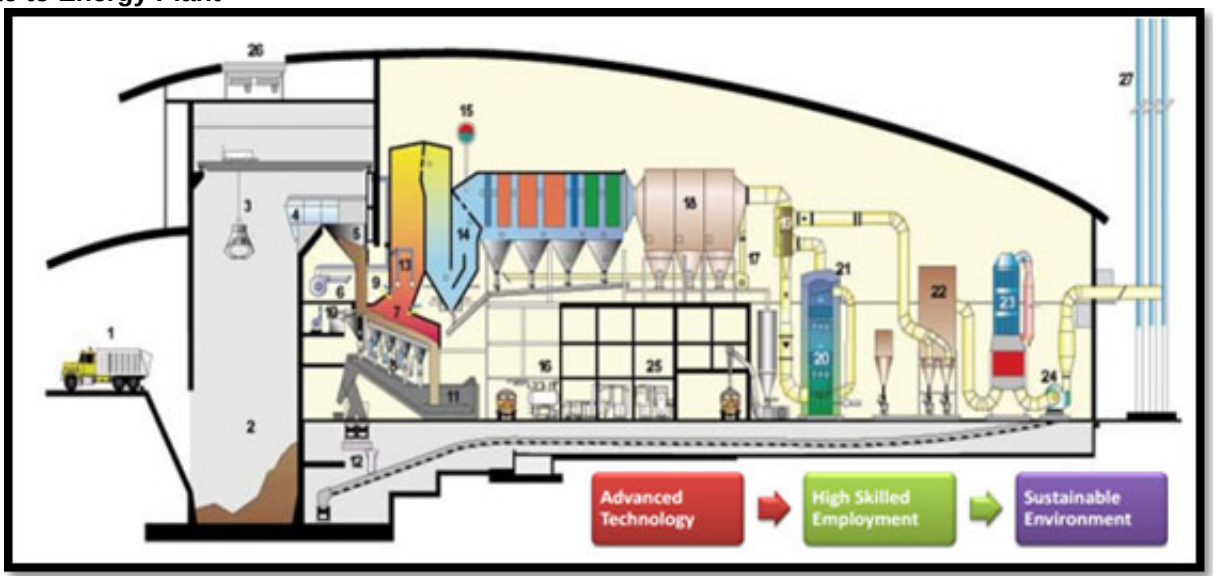
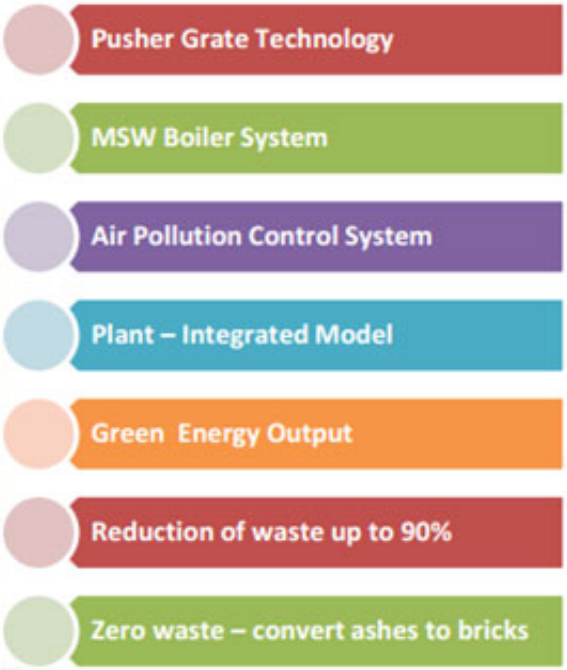
Waste to Energy - Integrated MSW Management

Waste to Energy Plant



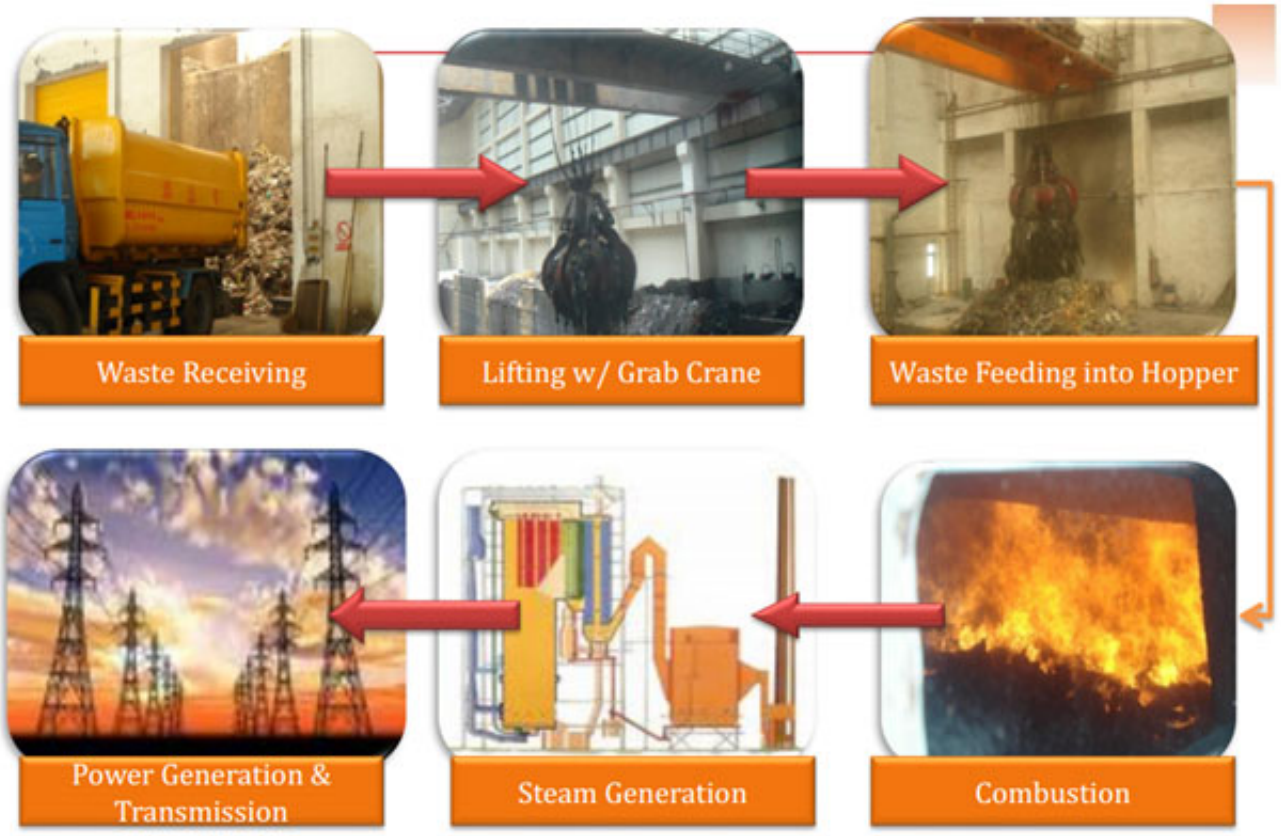
1 Truck unloading area 3 Overhead crane 5 Feed hopper 7 Pusher Grate 9 Secondary air 11 Wet deslagger 13 Auxiliary burners 15 Steam drum 17 Flue gas recirculation 19 Heat exchanger 21 Neutral scrubber 23 SCR catalyst 25 Control centre 27 Stack

2 Waste storage pit 4 Crane operator pulpit 6 Primary air 8 Air distribution 10 Ram feeder 12 Slag discharge 14 Steam generator 16 Condensate tank 18 ESP 20 Acid scrubber 22 Adsorbent 24 Induced draft fan 26 Water cooling



Incineration, slug and energy recovery Incineration is a process of control and complete combustion for solid wastes. It leads to energy recovery and destruction of toxic wastes, for example, wastes from hospitals. The temperature in the incinerators ranges between 980 and 2000 C. The best feature of the process is that it can be used to reduce the original volume of combustible solid waste byy 80%-90%. **Flue gas purification and residues** Flue gas purification has got many components in this wet treatment system. Upon leaving the combustion furnace with the boiler, the gasses – which at that point have a temperature of about 250° Celsius – are channeled through an electrostatic precipitator. This filter traps the larger particles, the so-called fly ash. In the case of a 'wet' treatment system like the ones we have in our existing two incineration lines, the flue-gasses then enter into a 'scrubbing' installation. This filter out primarily those substances that dissolve easily in water, such as sulphur dioxide (SO2, one of the culprits of acid rain) and hydrochloric acid (HCl) and that is how the purification process takes place. **W2E - Process Flow**

- Collected waste is received at the plant of W2E.
- The Garbage is than lifted by the crane towards the hopper.
- The garbage is than fed to the Hopper.
- It reaches the furnace, where the garbage is put to high temperature combustion process.



W2E - Merits & Principles Merits of Thermal proccessing, W2E merits and good combustion principles.

Thermal Processing – Merits

- WTE Plants are Efficient but capital intensive.
- Will be operated with advanced Distributed Control Systems in fully automatic mode
- Advanced Flue Gas Treatmen technologies exist and we adopt these technologies

W2E Merits

- Reduction of landfill by 25 % by weight.
- Renewable energy

- 500/600 TPD, Approximately 8 MW of Power

- CDM benefits over conventional composting

- (Approx) 1.1 Mn CER (over 10 Years for 10 MW)

- Residual Ash can be explored for alternate use - resulting in possible conservation of land for landfill
- Address concerns for socio-politial challlenges.

Good combustion principles

- Residence time for the combustion product of 2.5 seconds at > 850 Deg C for thermal destruction of fugitive emissions.
- Excess Oxygen atmosphere in furnace with balanced draft.
- Back End temp of Flue Gas is 210-220 Deg C for the effectiveness of the Flue Gas Treatment Scheme.
- Preheating the combustion air to accomplish in-situ drying of waste in the drying zone in the furnace

Salient Techhnical Features –W2E

- Reverse acting Reciprocating grate with inclination to allow sliding of waste on its own is selected.
- Six times the area than the travelling grate of previous plants
- Ram Feeders to push the waste positively on to the combustion zone
- Grabs to mix the waste to homogenize and feeding rather than overhead silo mode of storage to avoid bridging