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WASTE ENERGY MANAGEMENT

Introduction:

- Looking at the current scenario, we can all see that the state of our environment is deteriorating from day to day for a variety of reasons.

- Today, everyone leads a busy life, thanks to which we forget the importance of a good environment.

- At present, compared to the consumption of the resources v/s. our density of population, we are affecting our environment so poorly and the question of future sustainability arises

Should Waste Be Treated As a Liability or Can Be Used as a Resource (Assets) ?

CONVERTING LALU INTO HABU PRINCIPLE :

- WHAT IS LALU?
  It Stands For LOWEST AND LEASTUSE.
- WHAT IS HABU?
  It Stands For HIGHEST AND BESTUSE.

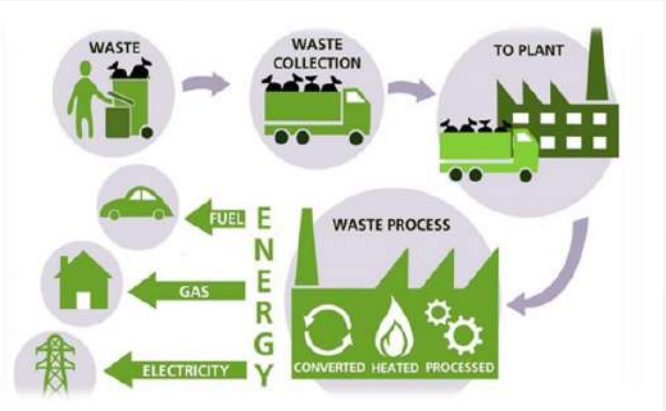
HABU IN WASTE TO ENERGY (WtoE) HOW HABU CAN BE USED IN CONVERTING WASTE TO ENERGY?

When waste is used as a resource by converting it into producing the energy. By optimum utilizing the trash and waste generated in the society into energy source we can say that we are making the Highest and Best Use of the waste resource.

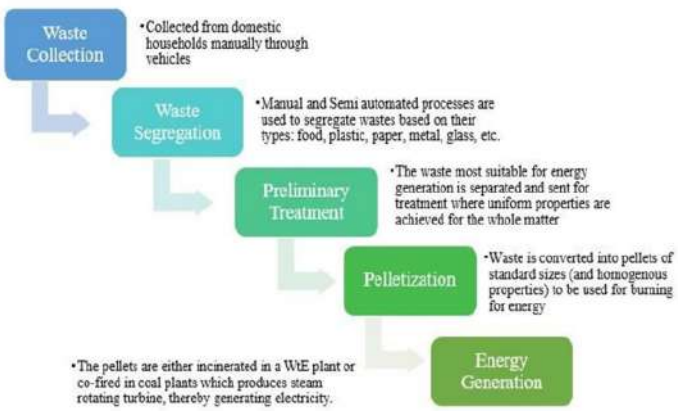
WHAT IS WASTE TO ENEGRY?

- The concept of Waste to Energy means Solid Waste Management.

- Solid Waste Management is the process of collecting and treating Solid Waste by segregating the required material & then converting it to Energy sources like Bio-Gas, Electricity, Fuel, etc.



PROCESS OF WASTE TO ENERGY



STAGES FOR PRODUCTION OF ENERGY FROM WASTE :

- In stage (1) Pre- processing of raw MSW and preparing refuse derived (fuel) and by product waste as earth filling, plastic waste and other items as disposal.

  MSW mixed waste will be transferred from the receiving area to Moving Bed Feeder (MBF) to the Trommel through feeding conveyors.

- In stage (2) Generation of power/electricity from RDF. The shredded material will be fed to ADS (Air Density Separator) & OBMS (Over bend magnetic separator) to remove theheavier particles like metal, stones. After ADS & OBMS the material is ready as RDF. This final processed material ("RDF") will be used as in-feed raw material for power generation in the power plant.

• SELECTION FOR THERMAL TREATMENT TECHNOLOGY:

	Selection Criteria / Parameters						
Technology	Pre-Treatment Requirement	Manual Segregation	Moisture Tolerance	Ash/Inert Tolerance	Tech. Maturity	Cost	Suitability to India Waste
Incineration	No	No	High	High	High	Medium	Yes
Gasification	Yes	Yes	Low	Low	Low	Very High	No
Pyrolysis	Yes	Yes	Low	Low	Low	Very High	No

- Incineration (RDF based Power) is the earliest technology for treatment of waste (MSW) in the world.
- Pyrolysis of waste material is relatively newer and Gasification is the latest technology to be used for treatment of waste.

Technical Inputs

Waste-to-Energy or WTE is defined as conversion of waste resource into energy either directly asa fuel or in form of heat or electricity. It is a "clean, reliable, renewable source of energy". More Specifically WTE is the recovery of latent energy present in the organic fraction of the solid or liquid waste through adoption of suitable waste processing and treatment technologies.

IN STAGE (1) PRE- PROCESSING OF RAW MSW AND PREPARING REFUSE DERIVED (FUEL) AND BY PRODUCT WASTE AS EARTH FILLING, PLASTIC WASTE AND OTHER ITEMS AS DESPOSAL.

- MSW mixed waste will be transferred from the receiving area to Moving Bed Feeder (MBF) to the Trommel through feeding conveyors.
- Big Stones and boulders will be removed from the waste from the feeding conveyors. In Trommel, the dust, dirt, organic having size less than 25 mm will be rejected which subsequently will be transferred to SLF (sanitary landfill site) allocated by ULB / MC.
- Other Mass having size greater than 25 mm will be fed to Shredder for further size reduction. The size of the material after passing through shredder will be less than 100mm. The shredded material will be fed to ADS (Air Density Separator) & OBMS (Over bend magnetic separator) to remove the heavier particles like metal, stones. After ADS & OBMS the material is ready as RDF.

- This final processed material ("RDF") will be used as in-feed raw material for power generation in the power plant.
- The homogeneously mixed waste will be transferred from thereceiving area to Moving Bed Feeder (MBF) to the Trommel through feeding conveyors.
- Moving Bed Feeder (MBF) – The raw waste fuel would be fed to MBF. MBF will act as storage cum dispensing unit for line balancing.
- Visual Inspection Conveyor –Skilled manpower employed to remove any boulders and stones from the waste by visual inspection would minimize the possibility of aggressive wear and tear on the equipment and other processing machines in the process.
- The visual inspection conveyor will feed MSW to the Trommel. The functional purpose of the trommel is to tumble the waste, screening the dust from 25 mm perforated screen and evaporate considerable amount of moisture present in the processed waste, hence, improving GCV of the processed waste.
- The <25mm material like dust, dirt, organic will be rejected for further transfer to SLF site. The >25mm material will be fed to Shredder for further size reduction. • Shredder –The material will be shredded to size <100mm with 2% reduction of moisture in final shredded material.
- ADS (Air Density Separator) –The Shredded material will be fed to ADS & OBMS to remove the stones, metal, heavy particles. After ADS, the material is termed as RDF and ready to feed for Power generation.

IN STAGE (2) GENERATION OF POWER / ELECTRICITY FROM RDF –

- In this stage the RDF produced in Stage 1 would be used as fuel in the boiler for generation of steam
- Electricity in the waste-to-energy plant will be generated by combustion of pre-processed Fresh Mixed Municipal Solid Waste (i.e., RDF) in a specially designed furnace, capturing the heat from the gases in the boiler which converts the water into steam.
- Steam would then be used in Turbine which in turn rotates the electrical generator to produce electricity in Alternator
- The electricity so produced would be fed to the transformer from where it would be exported out of the switchyard to the nearest approved / selected sub-station of GUVNL.
- The flue gases are passed through a stringent multi-stage cleaning system to meet global and local emission standards and compliances

STATISTICAL DATA FOR MSW

THE FUTURE OF WASTE TO ENERGY (WTE)

The waste-to-energy market is growing; valued at $35.1 billion in 2019, it is forecast to reach $50.1 billion by 2027.

Solutions like WtE are best viewed on a spectrum. Most green energy and waste disposal methods still have some detrimental effects on the environment. It is important for the environmental and scientific communities to continue to explore fossil fuel alternatives and promote Zero Waste paths as we move forward in our battle against climate change.

In our critique of the Planet of the HUMAN'S documentary, we quoted Dana Nuccitielli from Yale Climate Connections, who concluded; "The film's [black and white view of renewable energy] is akin to arguing that because fruit contains sugar, eating strawberries is no healthier than eating a cheesecake". The same can be said of waste to-energy.

WtE is not without its negatives, but it is better than landfill – and for many countries under pressure to act on climate change, it appears that that is good enough for now.

BIBLIOGRAPHY

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