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RECENT TRENDS IN WASTE MANAGEMENT

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I. INTRODUCTION

With the increase in population the waste material has been increased and it has become a serious problem to dispose the Waste which has adversely affected the environment but with a word “**waste management**” we mean that how to overcome from this smartly and efficiently. As we are facing power crisis so, generating of power from waste material may be the best option for the waste management. This objective is achieved by converting waste to energy through various technologies. So in this we are dealing with the whole process of converting waste to energy and then to power using different technique to increases the utilization aspects of waste material to power .The whole process can be treated in three different stages. Firstly, by reducing, re-using & recycling of waste material. Secondly, by generating biogas and electricity. Thirdly, by using remains of second stage as bio fertilizer, flash bricks and compressed blocks for fire fuel.

Since every sector such agriculture, industrial and household sector are the great source of waste material so with certain objective along with technology it can served as better option in converting them to efficient fuel which further can be used in generating electricity power. And finally they can used further until their utility is finished.

II. OBJECTIVES

1. To promote “R-R-R” of waste management (Reduce, Re-use & Recycle) among the people.
2. Conversion of waste to a fuel.
3. To reduce various types of pollution.
4. To increase public awareness towards environment.
5. To enhance and promote the use of renewable source of energy.
6. To promote the coordination of technology with management.

TYPES OF WASTE:

- SOLID WASTE & LIQUID WASTE

SOLID WASTE

- Household Organic waste.
- Timber waste.
- Paper & plastics waste.
- Agriculture waste.
- Medical and commercial waste.
- E-Waste & etc.

LIQUID WASTE

- Sewage waste
- Alkali and acid waste
- Industrial waste
- Heavy metal liquid waste
- Animal dung & etc.

III. RESENT TREND IN WASTE MANAGEMENT

The “R-R-R” of waste management.

1. Reduce. 2. Re-use. & 3. Recycle.

REDUCE

This indicates unnecessary use of material and product which causes waste thus by reducing the use of such things can help a lot in reducing the generation of waste material.

REUSE

It is a process of using a product more than once time until it is unable to use. In this we can control in producing the waste at least by some percent.

RECYCLE

Recycling is the process of converting waste material into reusable objects to prevent waste of potential of useful materials and to reduce the consumption of raw material. As we know that we have limited amount of our natural resources which is being consumed very fast rate with the increases in population the rate has increases exponentially. If the process of recycling is not practiced then the day is not far when we will not have any of our resources left in stock. There are certain waste which can't be dumped or burnt like plastic metals and glass products. So these things must be recycled so as to maintain their usability property and as well as to avoid degradation of environment and to promote sustainable consumption of resources.

IV. BIOGAS BASED GENERATING PLANTS

In this process biogas is used as a fuel which contains 65% to 70% methane which defines the calorific value gaseous material. As we will not be dealing with the production process of biogas here but the process which include beyond that is discussed in brief. As calorific value of biogas is 6kWh/m^3 equal to half liter of diesel oil in normal. But we can't burn it directly it need to be purified before burning. In this the chemical energy if biogas is converted to mechanical energy in control combustion by heat engine in cogeneration process i.e.- combined heat and power (CHP). Gas turbine is more efficient in cogeneration (combined heat and power). At present we don't have enough idea about gas turbine for large application of generation but for a range between 5 KW to 500 KW it is most preferred. This energy can be used for household electronics appliances and exceed can be supplied to nearest grid. The biogas which we directly obtained can be used as cooking fuel as best alternative in urban as well as rural areas.

Advantage/disadvantage along with environment aspects

Advantage

- Renewable source of energy.
- Easily availability of raw material.
- Fuel cost and running cost is economical.
- Reduced pollution.
- Eco-friendly to environment.
- Reduction in volume of waste material.
- Less emission of green house gases such as CO_2 , N_2O , O_3 , CFC, CO etc.

Disadvantage

- Capital/installation cost is higher.
- Problem in co-ordination with government for municipal waste
- Power density is low.
- Requires expert guidance and maintenance.

Waste incineration energy plant

Waste incineration based power plants utilizes the solid waste or semi dried agriculture waste in converting them directly to electric energy. Here the raw materials are solid waste instead of petroleum, coal and gaseous fuel which is a great achievement in waste management. The solid wastes are passed through the process of pyrolysis to convert them into a suitable fuel to produce heat under control combustion. Pyrolysis produces a mixture of solid, liquid and gas in definite proportion. This mixture is then very much suitable to provide a standard calorific value. The burning of mixture produces enough heat to form steam and heat energy of steam is then used to rotate turbine. The turbine is coupled with alternator and electricity is produced. This type of plants can generate electricity from (50-150) MW.

Advantage/ disadvantage concerned with environment

Advantage

- Reduce pressure of land.
- Reduce volume of wastes up to 90%.
- Reduces the requirement of large land for disposal process.
- Generation of power at availability site so that reduce transportation charge.

Disadvantage

- Release of green house gases/ toxic gases during burning process but in very less amount.
- Required frequent maintenance.
- Requires expert handling during production process.
- Plant acquires large area of land.

V. CONCLUSION

- After the generation of biogas and electricity we found that byproduct as remains of process have some availability to go to further more stage of processing.
- Since we are reducing the volume of disposed waste up to 90% but the remaining 10% of ash may be hazardous and create air pollution if not disposed properly lest they are very fine particle and can mix with air easily.
- i.e.- the processed remains can be used as bio-fertilizers or instead of that those processed remains can be compressed to a block which can be transported and could be further used as fire fuel where required like for cooking and heating purpose.
- The final ash extract what be obtained from the waste to energy fuel incineration plant can be directly transported to flash brick industry for making flash bricks for construction purpose.

VI. SOLUTION

- Further use of byproduct of biogas & incineration plant waste in making bricks and in compressed as a fuel for cooking. As the remains 10% may create problem.
- By digitalization instead of paper use.
- By 3D printing and posters.
- By controlling on the rate of growth of population.
- By limiting the use and by controlling consumption rate.

REFERENCES

1. Internet based materials .
2. Various Books on waste management.