

Waste-to-Energy solution Technology for next Generation

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Abstract: waste to energy facilities a number of environmental considerations that range from environment control to potential generation of greenhouse gas off set credits. The adoption of standard operation procedures and modern air pollution control equipment effectively controls each of the contaminants ensuring that most stringent emissions standard can be achieved. The waste generation in India is about 90 million per year. The per capita increase in waste generation is projected at the rate of 1-3.5. Waste to energy (WTE) or Energy from waste in its strict sense refers to any waste treatment that creates energy in the form of electricity or heat form. Due to continue growing economy our country the consumption has increase in coming year of fossil fuels. Total energy supply about 78% of coal contributes to electricity production in India. That by 2030 India will depend on 39% of total requirements will have to be satisfied by importing of good quality of coal. To overcome the above mentioned problems only waste to energy treatment will solve the energy crisis. Energy recovery from waste is consisting with and complementary of modern integrated waste management practices.

Key Words: Pollution, greenhouse gas, environmental emission, economy, coal, electricity, waste generation, regular hurdle, high capital coast, citizen group.

Introduction:

The amount of solid waste generated each year has been increasing much faster than population growth. Growing demand of energy is also increases.

Today, we face numerous environmental & economic challenges:

- Population growth and associate waste disposal needs
- Global Warming
- Dependence on fossil fuels

There is a common solution for all of these challenges.

Energy from Waste provides:

- Safe, economic waste disposal
- Greenhouse gas reduction
- Renewable energy

Waste treatment has become a significant problem due to large volume of generated worldwide and its impact on the environment. The main impact relate to atmospheric emission and aqueous effluents from landfills and activities for waste collection, transportation and finally processing.

The waste generation in India is about 90 million per year. The per capita increase in waste generation is projected at the rate 1-1.33% annually with increase pollution of 3-3.5% per annum. The yearly waste generation is expected to increase by 5%.

Waste to energy or energy from waste in its strict sense refer to any waste treatment that create energy in the form of electricity or heat from waste sources and more advanced waste to energy process result in usable fuel commodity such as hydrogen or ethanol.

Waste to energy is an important tool capable of reducing simultaneously the problems in energy supply and pollution prevention.

Energy Scenario: India is developing country. The energy is very important input for the economic growth of the country. The per capita consumption of energy is very low as compared to the other developed countries.

Due to continue growing economy our country this consumption has to increase in coming years. The coal contributes to about 42% of total energy supply. About 78% coal contributes to electricity production in India.

By 2030 India will depend on 50% import for energy. 39% of total requirement will have to be satisfied by importing good quality coal.

To overcome the above problem of MSW treatment and energy crisis novel technique was developed for treatment of biodegradable waste by thermal process. This is completely eco- friendly. There is total conversion of biodegradable waste into value added products.

Waste to energy Technologies: fossil fuel consumption has increased over the past century becoming a primary source of energy. For many countries around the world and accounting for over 85% of global energy produced. In combination with a rise in energy demands, this depend on fossil fuels is leading to high carbon emission resulting in climate change problem. In addition, because fossil fuel are in finite source of energy, energy prices are continue rising due depletion of fossil fuels reserves. Thus there is urgent need to think about some alternative sources of energy. Energy from waste is consistent and complimentary to modern integrated waste management practice.

Modern WTE is considered to be a source of partly renewable energy by the U.S federal government and 15 US states that have established renewable energy program. Also some European countries that have established renewable energy program consider production through WTE as renewable.

Approximately 130 million tonne of MSW are combusted annually in over 600 waste energy facilities that produce electricity and steam for district heating.

Challenges:

Technology Challenges-

1. Lack of versatility – Many waste to energy technologies are designed to handle only one or few types of waste (plastic, biomass or other). How it is often impossible to fully separate different types of waste or to determine the exact composition of waste sources.
2. Waste gas clean up – The gas generated by process like pyrolysis and thermal gasification must be cleaned of tars and particulates in order to produce clean, efficient fuel gas.

3. Conversion efficiency - Some waste to energy pilot plants particularly those using energy intensive techniques like plasma have functioned with low efficiency or actually consumed more energy than they were able to produce. Many site in India have been forced to shut down because they were not financially sustainable once government subsidies ran out.

Strategic challenges-

1. Regulatory hurdles – The regulatory climate for waste to energy technologies can be extremely complex.
2. High capital coast – Waste to energy system are often quite expensive to install. Despite the financial benefits they can promise due to reduction in waste and production energy assembling the financial packages for installation is a major hurdle, particularly for new technologies that are not widely established in the market.
3. Opposition from environmental and citizen groups – Because traditional incineration based waste to energy technologies can produce significant pollution from the burning of waste, environmental and citizen groups have often opposed such system.

However, many activities remain unconvinced some express concern that using waste as a feed stock for energy generation will cause municipalities to abandon their efforts in waste reduction recycling and composting.

Conclusion: waste to energy facilities encompass a number of environmental considerations that range from emission control to the potential generation of greenhouse gas offset credits. The adoption of standard operating procedures and modern air pollution control equipment effectively control ensuring that standard can be achieved.

India has large market for waste to energy project, a large urban poor population and country inclusion quickly. In India national legislation relating to waste to energy and incineration is less prominent.

References:

1. EESI.2009. Reconsidering municipal solid waste as a renewable energy feed stock prepared by the environmental and energy study institute, Washington DC, July 2009. www.eesi.org.
2. Energy recovery council “waste to energy is a climate friendly, renewable energy source”. Energy recovery council-
<http://www.energycouncil.org/userfiles/file/ERC%202009%20climate-renewable%20paper.pdf>
3. EUROPA,2001, waste management legislation,<ec.europa.eu/environment/enlarge/handbook/waste.pdf> accessed 09/02/2011.
4. Book. - Industrial waste treatment technology by Dr.Ahmad Ashtag, S.K.Kataria & sons, New Delhi.
5. Waste to energy, The clean tech report, 2007 Lux Research Inc.