Waste-to-Energy Plants – Feasibility & Challenges

Solid Waster Management:

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A credible solution on the management of solid waste or garbage in our cities must have three elements?

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- The first element is **segregation** of biodegradable or wet waste from dry waste at source.
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- The second is that once segregation is achieved, municipal governments can use **wet waste to produce compost and biogas** in biomethanation plants.
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- And the third is that the dry waste, after removing recyclable elements, should go to **waste-to-energy plants**. This will reduce the volume of waste that remains to be sent to landfills.
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What is a waste-to-energy plant?

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- A waste-to-energy (WTE) plant is a waste management facility that **combusts wastes to produce electricity.** This type of power plant is sometimes called a trash-to-energy, municipal waste incineration, energy recovery, or resource recovery plant.
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- A number of WTE plants are coming up in urban India, using incineration, Refuse Derived Fuel based combustion or conversion technologies such as pyrolysis and gasification.
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- There is a great deal of confusion about what the different technologies entail, and also apprehension about the potentially damaging impact of WTE plants on the quality of air and on public health. There are also questions about whether these plants are financially viable.

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- Incineration-based waste-to-energy plants rely on mass burning of municipal solid waste, which involves complete combustion into ash. Depending on what is being combusted, **the gases generated may contain dioxins and furans, which are toxic and can be lethal.**
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- These plants therefore need to put in place emission control filters of a very high standard to check the release of harmful gases into the atmosphere. There is a need for continuous monitoring of emissions and sharing information openly.
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What are some of WTE technologies?

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- The innovations in WTE technologies worldwide have been focusing on **pyrolysis, gasification and plasma gasification,** which can deliver cleaner emissions but are considerably more expensive.
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- These technologies involve – heating of solid waste at very high temperatures in an oxygen-controlled environment, such that the thermal reactions produce **syngas** which has the advantage that it can be burned directly or transported through pipelines.
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Do the pollution controling authorities do their job?

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- Pollution control boards set up by the government were expected to provide technical assistance and keep a check on the emissions/environmental footprints of waste-to-energy plants.
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- Unfortunately, **they have not kept pace with the rapidly evolving technology** in the field of pollution control and were not able to check routine defaulters.
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- Recognising the need for a more empowered body that could enforce adherence to environmental regulations, the NGT was set up in 2010, as an independent judicial body under an act by the Parliament of India.

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- As a judicial body in charge of supervisory jurisdiction over all environmental matters, NGT has, in many cases, been setting the rules of the game and putting the weight of legal compensation and enforcement behind its rulings.
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- **Hopefully, NGT will receive full support** from the Central Pollution Control Board in its quest for scientific evaluations of the environmental impact of waste-to-energy plants.
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What are the challenges faced?

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- The **level of subsidy required** to make WTE plants financially viable presents another set of problems. These plants involve significant capital investment and the cost of energy produced is higher than from the grid, unless there are government subsidies.
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- Municipal bodies give benefits to WTE plants, such as land for free or at token amounts plus a tipping fee for each tonne of waste processed. However, this **does not suffice to make the cost of electricity produced** from these plants competitive with conventional sources.
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Concluding remarks:

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- The talk of waste to wealth in this context is misleading. A subsidy is still needed; a transparent method must be found to determine the maximum subsidy feasible through competitive bidding.
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- **Enthusiasts sometimes speak of waste-to-energy as a solution to our energy problem — this is not correct.** However, if implemented to global emission standards, it could be a pathway to scientific and sustainable disposal of municipal solid waste, given the scarcity of urban land in the country, while also generating some much needed electricity.
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