Waste to Energy Projects in India

Why in news?

Kerala government recently announced the State's first waste-to-energy project in Kozhikode.

What is a waste to energy project?

- **Waste-to-energy projects** - Waste-to-energy projects use *non-recyclable dry waste* to generate electricity. The waste is combusted to generate heat, which is converted into electricity.
- The waste to energy projects is also called a *trash-to-energy*, municipal waste incineration, energy recovery, or resource recovery plant.
- **Status of for waste to energy** - The first waste-to-energy plant was set up in Timarpur in Delhi in 1987.
- A total of 14 waste-to-energy plants have been installed in India, out of which seven plants were closed.
- Total quantity of solid waste generated in the country was 1,50,761 tonnes per day in 2019-'20.

What are the technologies available for waste to energy?

- **Biomethanation** – It is anaerobic digestion of organic materials which is converted into biogas.
- Anaerobic digestion (AD) is a bacterial fermentation process that operates without free oxygen and results in a biogas
- **Incineration** - Incineration technology is complete combustion of waste with the recovery of heat to produce steam that in turn produces power through steam turbines.
- **Gasification** - Gasification is a process that uses high temperatures (500-1800o C) in the presence of limited amounts of oxygen to decompose materials to produce synthetic gas.
- **Pyrolysis** - Pyrolysis uses heat to break down combustible materials in the absence of oxygen, producing a mixture of combustible gases, liquids and solid residues.

What is the significance of waste to energy projects?

- Effective disposal of waste
- Landfill and dump yards can be reduced
- The petroleum import can be reused leading to increased economic growth
- It can be the alternate source of energy to promote *circular economy*

What are the reasons for the failure of waste-to-energy projects?

- **Huge gap** - The huge gap between the quantity and quality of waste being generated, and the capacity of the municipality to manage that waste.
- **Low inert content** - The waste has inert content which is not suitable for burning in Waste-To-Energy Project
- **Requirement of fuel** - which makes the Waste-To-Energy Project unviable.
- **Low calorific value** - The municipal waste has low calorific value and high moisture content which is not suitable for electricity generation.
- **High costs of energy production** - The cost of generating power from waste is around Rs 7-8/unit.
- While the cost at which the States' electricity boards buy power from coal, hydroelectric, and solar power plants is around Rs 3-4/unit.
- **Environmental damage** - Most of the projects are built in ecologically sensitive areas which also damage the environment.

What is the way forward?

- People should follow strict segregation practices and also process biodegradable waste.
- Municipality must ensure that only non-biodegradable dry waste is sent to the plant and separately manage the other kinds of waste.
- Municipality or the department responsible for Solid Waste Management should be practical about the high cost of power generation, and include the State electricity department.
- A tripartite agreement between the municipality, the plant operator, and the power distribution agency.

References

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