

## PROSPECTS OF WTE DEVELOPMENT IN UKRAINE

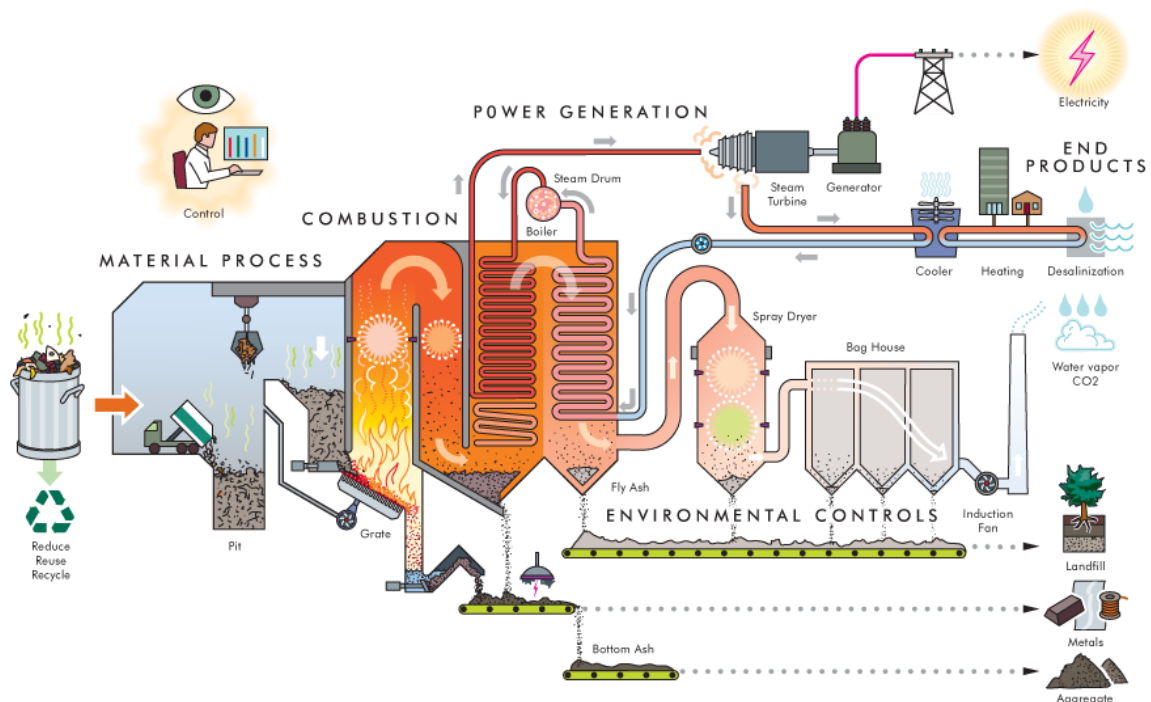
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Ukraine has a huge problem with garbage. Every year Ukrainians throw away around 11 million tons of garbage, that's 300 kilograms per person. 94% of these 11 million tons are buried in the many landfills, which take up around 100 square kilometers. To illustrate, that is as big as 14,000 football fields. To worsen the situation, over a half of them are uncertified and do not meet the ecological norms. Moreover around 27,000 illegal landfills appear all over the country yearly.

One of the effective solutions to the landfill problem, which is already heavily used by numerous countries is incineration.



*Modern incinerator working principle*

Incineration is a waste treatment process that involves the combustion of organic substances contained in waste materials. Industrial plants for waste incineration are commonly referred to as waste-to-energy facilities. Incineration and other high-temperature waste treatment systems are described as "thermal treatment". Incineration of waste materials converts the waste into ash, flue gas and heat. The ash is mostly formed by the inorganic constituents of the waste and may take the form of solid lumps or particulates carried by the flue gas. The flue gases must be cleaned of gaseous and particulate pollutants before they are dispersed into the atmosphere. In some cases, the heat that is generated by incineration can be used to generate electric power.

### Usage around the world

Waste to energy facilities are typically used in countries which do not possess excess land for landfills, therefore Japan which is a densely populated island transforms most of its garbage into energy as well as recycles. Also, Scandinavian countries are well-known for reusing trash, for instance Sweden.

Generally, the percentage of waste transformed into energy is increasing in every country. China, the most populated country in the world, has started the construction of many WtE power plants. European countries, inspired by Scandinavia, are also quickly developing WtE technologies, most notably Germany, Switzerland and Austria.

#### Advantages

- WtE facilities reduce the volume of waste in the landfills by around 80%
- Less garbage in the landfills means that it produces less methane which is notably hazardous.
- Prevents soil and underground waters pollution.
- Allows the community to partially sustain itself, transforming municipal waste into heat and energy or fuel.
- Employment creation.

#### Disadvantages

- WtE is not completely “green” as it still produces CO<sub>2</sub> from the waste combustion and potentially dangerous heavy particles if the process is not supervised properly.
- Long payback period which makes WtE plants unattractive to investors.
- Low efficiency compared to other energy sources.
- Ineffective in small communities as they can not produce sufficient amount of waste to effectively use WtE plants.

#### Conclusion

WtE is primarily a way of reusing waste and not an effective energy source. Energy recovery is mostly an addition. However, this addition is very important for the communities where they are located as they help them become more independent.

Unfortunately, there’s a fly in the ointment and that is ecology. Many activists claim that WtE plants are harmful to the environment as they can potentially create CO<sub>2</sub> and dioxins, which is sadly true. Instead of using incinerators they suggest recycling and reusing more, however some materials can not be easily recycled and still appear in the landfills where they are left to slowly decompose. It is worth noting that while garbage decomposes in landfills it produces methane, which is significantly worse than CO<sub>2</sub> at creating the greenhouse effect and considered to be more harmful.

To conclude, WtE is not perfect. It still produces CO<sub>2</sub> and potentially other gasses if safety regulations are not met. However, it is way to dramatically decrease the volume of waste in the landfills and generate energy as well as heat in the process. Also, modern technologies make it much cleaner every year and many

countries use these facilities at full capacity, such as Sweden and Japan both of which are considered to be very strict with ecology. So maybe Ukraine should use the experience of the rest of the world to finally deal with the garbage problem and leave the thousands of landfills in the past.

### References

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