

# WASTE MANAGEMENT **Practices**

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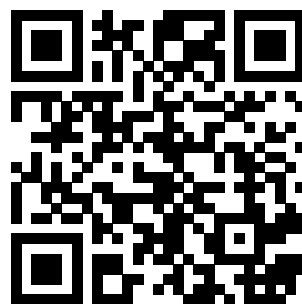
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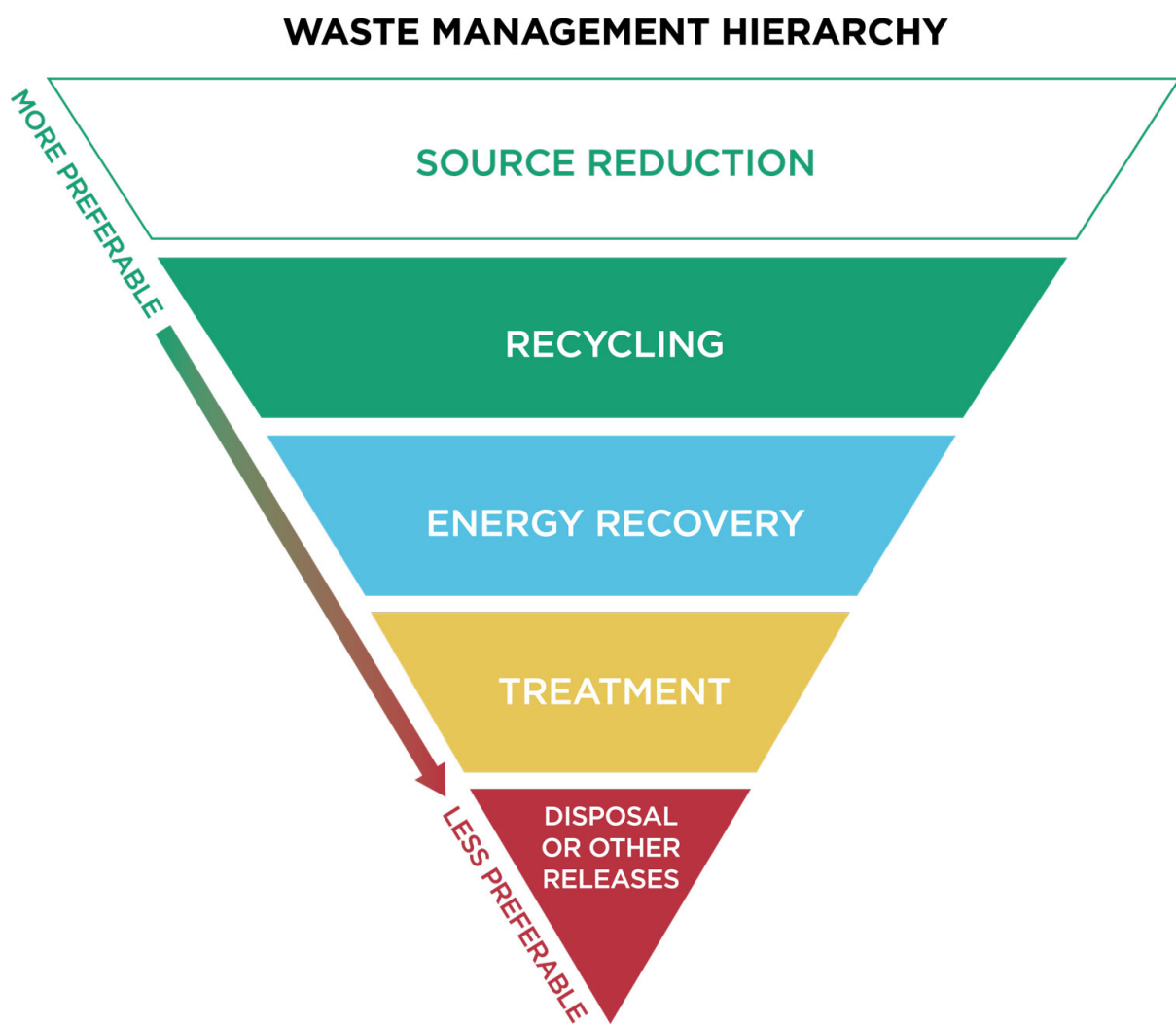
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# WASTE MANAGEMENT PRACTICES



*Fig 1. Waste Management Hierarchy. US Environmental Protection Agency. (n.d.). Pollution prevention and waste management.*

## THE MANAGEMENT

Global waste production is rising exponentially, despite the demand for increased corporate responsibility and the promise demonstrated by continued sustainability solutions that have been developed to address waste generation across all ranks of society. By 2050, waste production will rise from approximately 2.01 billion tons to 3.40 billion tons on an annual basis. This issue will continue to represent a major concern for governments around the world, as environmental impacts will continue to be profound and widespread - from urban landfills to the most pristine ecosystems on the globe. A vast amount of waste is expected to be further generated as populations develop and cities grow.

An additional issue facing the industry is the mistreatment of waste on a governmental and private level. Currently, systematic frameworks for managing waste are too vaguely defined, and organizations are attempting to adopt to the global trend of consumerism, which incorporates a manufacturing system in one place, a purchase and usage scheme in a second and a disposal process in a third. A standardized waste management system is therefore undoubtedly important in order to unify various practices worldwide.

Waste management is becoming an increasingly vital area of consideration, and each area within its chain of processes operates according to its own particular set of rules, based on different procedures. However, the development of a hierarchical method that categorizes all the various treatments into a comprehensive procedure is necessary. This structure will cover the lifecycle of a product; from its manufacturing to its handling as a waste, extracting all the benefits it can get from each phase of the process. The main target of this concept is to support the repurposing value of waste in order to have the minimum environmental impact; nevertheless, there are still kinds of waste that cannot be treated in this way. Thus, the waste management hierarchy has been extended to include more models.



## AWARENESS

In order to achieve a proper waste management system, focused on the protection of the population's health and the environment, is important to stimulate public awareness. By fostering appropriate education programs and training people in developing sustainable habits, as well as replacing outdated business practices, will alter waste management schemes for the better.



Suitable programs have been proposed to further modernize the processes, permitting more efficient organization and circulation of waste materials, driving firms towards the top of the waste management hierarchy. Additionally, various forms of waste, such as plastic or nuclear waste, need further consideration based on their treatment processes. Identifying specific materials and the correct ways to handle them provides a valuable opportunity for developing new knowledge. Finally, through perceptive metrics, companies can recognize the benefits and drawbacks of their waste habits and manage to improve them<sup>1</sup>.



## PLASTIC WASTE

Plastic has become an omnipresent aspect of contemporary life, and form a major component of manufacturing and industrial waste. Due to its widespread presence and much publicized status as a source of non-biodegradable waste, there are a lot of misperceptions surrounding the hazardousness of plastic for our planet.

It is still widely used in mass-manufacturing, and can be found in a variety of products. Its applications include uses as varied as fibers in garments to microbeads in cosmetics. However, there is a distinction between single-use plastic and reusable plastic, while both provide their own sets of risks<sup>1</sup>.



### UNSUSTAINABLE PLASTIC

Plastics are created from fossil fuels, such as coal, natural gases, and crude oil. This means that the producing method itself constitutes a hazardous factor within the wider environment. In addition, not all plastics are fully recyclable, so there are many new plastics which are produced from the old plastics. For example, while the amount of original plastic is lowered in quality when recycled, the recycled plastic is then turned into more other products, rather than the original one item, through a process is known as downcycling. Furthermore, not all recyclable plastic products are recycled due to the costs and difficulty involved in maintaining these processes, and due to a lack of commitment and awareness on the behalf of the population.



#### TOXIC PLASTIC

While there are a few biodegradable plastics that can be composted available, they are rarely used due to their high cost. Most plastics encountered across various industries are not compostable; in fact, they require a thousand years or more in order to be decomposed in landfills. Thus, if they are left to degrade, harmful chemicals are leached into the environment. These toxins can eventually impact the food chain, seeping into natural environment, agricultural produce and water, impacting the health of populations and the natural ecosystem.

Plastic degradation does not mean complete decay of the material, instead it decomposes into small pieces and particles that are recognized as microplastics within the environment. Consequently, organisms within those environments consume the plastic waste that they mistake for food, which often results in injury or death. In 2017, scientists discovered that a third of UK-caught fish contained plastic.



## NUCLEAR WASTE

In the 1930s, one of the greatest scientific breakthroughs of the century occurred when it was found that a large amount of energy could be produced by splitting a large atom in two. Later scientists arranged these atoms in a certain way within a machine, with one atom splitting setting those next to it off in an explosive chain reaction that generates an incredible amount of energy. The machine used to contain this reaction is called a nuclear reactor, converting the energy generated into electricity.

The electricity produced is used in much the same ways as electricity that is generated through other methods. The energy expelled from the splitting of a large atom is called radiation, and can take up to thousands of years to fully disperse. This radiation is highly dangerous if it escapes into the biosphere before it is deemed safe for it to do so. In 1986, the disastrous explosion and fire in the No. 4 reactor at the Chernobyl nuclear plant caused radioactive waste to escape into the atmosphere, with devastating consequences on the surrounding environment and population.



## NUCLEAR WASTE TREATMENT

Used nuclear fuel is often stored underwater for a period of five years before being moved to dry storage, where it rests for a long time before its final disposal. High-level nuclear waste is often stored for around fifty years before disposal, due to the waste becoming less radioactive over time. The final disposal takes place deep underground, when it is deemed safe enough for this to take place.



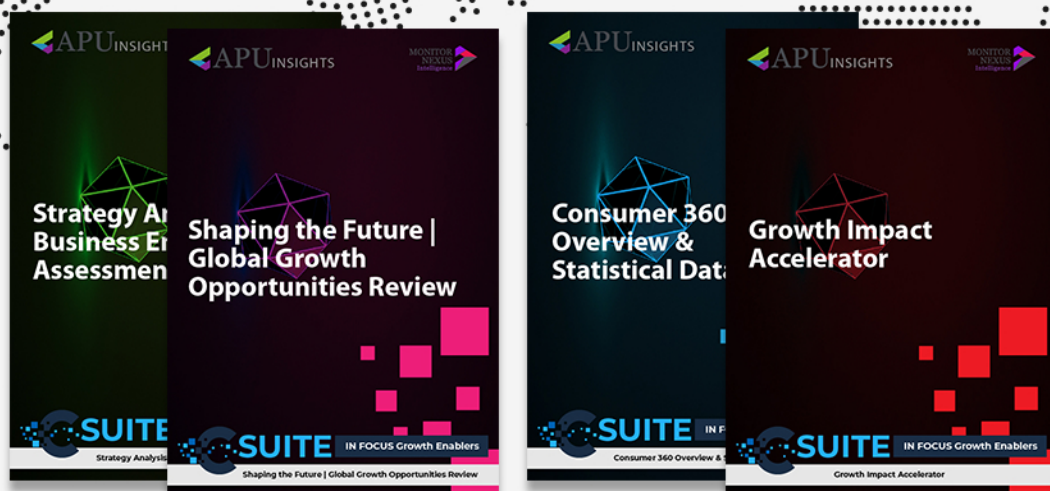
## NUCLEAR VS OTHER ENERGY METHODS

There are many arguments against this method of energy production, for a number of reasons. These include concerns about safety, regarding both human health and the natural environment. It seems very regressive and counterintuitive to create nuclear energy at a time when clean and safe sustainable alternative methods are available. Reasons nuclear energy production still exists include:

- Nuclear energy is not sensitive to different weather conditions.
- No greenhouse gas emissions.
- Nuclear energy is cost-efficient compared to methods of generating energy from fossil fuels<sup>2</sup>.

## **REFERENCES**

1. RTS. (2019). Your Guide to the Types of Waste Management and Their Effective Implementation.
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