

Warning: Trashing the Ocean is Killing Marine Life

The entanglement and ingestion of plastic is killing marine life at an alarming rate. Thousands of seabirds, sea turtles, seals, and other marine mammals die from this each year. Endangered wildlife like [Hawaiian Monk Seals](#) and [Pacific Loggerhead Sea Turtles](#) are among nearly 700 species that swallow or get caught in plastic waste.

On top of this already troubling situation, the [fossil fuel industry](#) plans to increase plastic production by 40% over the next decade. Oil giants are rapidly building petrochemical plants across the United States to turn fracked gas into plastic. This means more toxic [air pollution](#) and more [plastic](#) in our [oceans](#).

Individuals frequently litter beaches or dispose of trash directly into the water from boats or offshore installations like oil rigs. In most cases, [litter makes its way into the ocean from land](#). Storm drains, canals, and rivers carry the debris into the ocean. The wind can even blow trash into the [water](#) from landfills and other areas. Additionally, storms and accidents at sea can cause ships to sink or lose cargo.

How Human Waste Gets into the Ocean

The [world's sewage](#) has to go somewhere, and unfortunately, 80% of the [sewage](#) produced by the global [population](#) makes its way into the world's oceans [untreated](#). Lack of public [sanitation](#) efforts, a lack of political will, or simple disinterest keep this problem 'out of sight and out of mind' for many.

Once in the [marine environment](#), [plastics](#) can absorb chemical [pollutants](#) from surrounding waters and transport them great distances as they move with ocean currents ([Gallo et al., 2018](#)). When animals eat plastic, these chemical pollutants can leach into their stomachs, [causing toxic effects](#). This damaging [environmental](#) impact has prompted bans on certain chemicals in an effort to minimise production. However, some are so persistent in the environment that they still exist today.

how is E-waste Killing Marine life?

[E-waste](#) (electronic waste) is made up of discarded electronic equipment. Unfortunately, the most popular current method for disposing of e-waste creates many problems. It often ends up in landfills and over time this harms [marine ecosystems](#). The term e-waste encompasses electronics that are refurbished, reused, resold, or recycled. Despite this, the sheer volume of e-waste that ends up in landfills is a growing concern. Informal processing of e-waste in [developing countries](#) is often dangerous to both humans and the environment. It can lead to adverse health outcomes and [environmental pollution](#).



E-waste is killing marine life at an alarming rate.

Source: [NETSPRING](#)

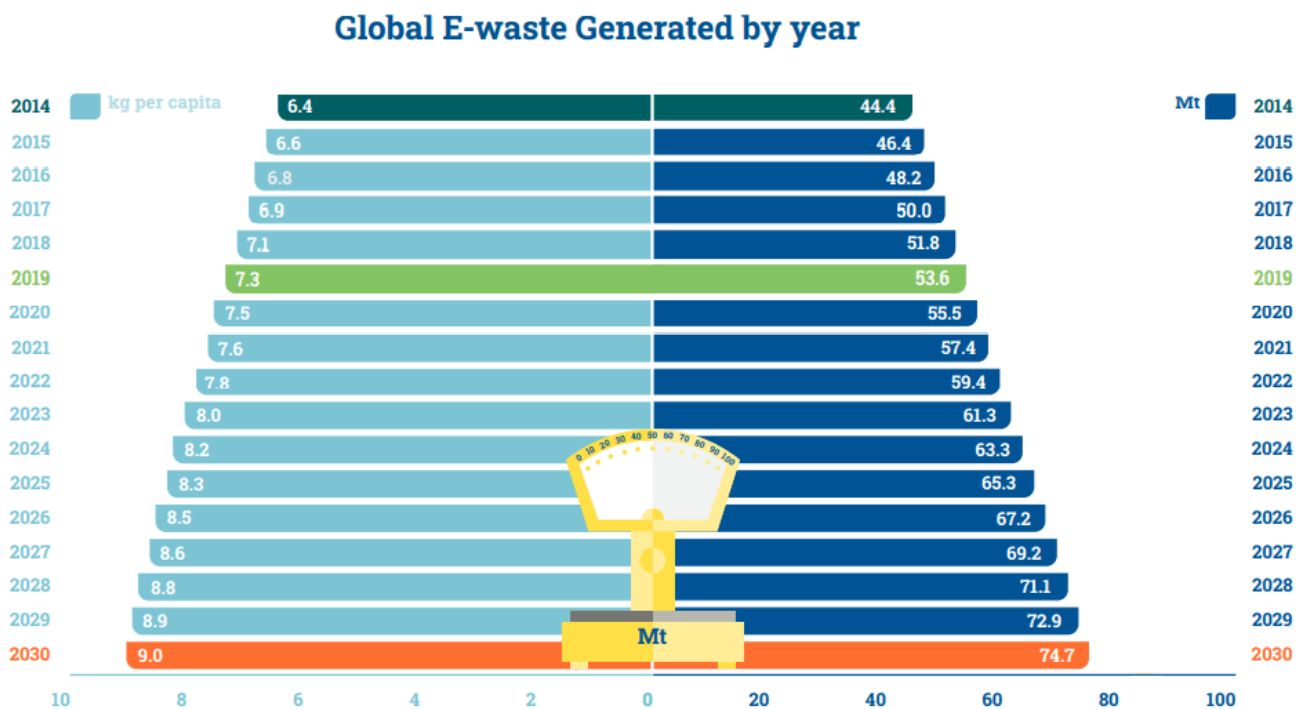
It is imperative that we properly dispose of all [e-waste](#), not only to prevent damage to marine life but also because recycling electronic goods often recovers useful materials. We can reuse recovered materials like gold, glass, and copper, which reduces the energy required to mine, refine, and manufacture them from

their raw state. It also reduces pollution and [greenhouse gas emissions](#).

Protecting our seas

The Environmental Protection Agency (EPA) states that by [recycling 1 million cell phones](#), we can recover 35,000 pounds of copper, 33 pounds of palladium, 772 pounds of silver, and 75 pounds of gold. [E-waste](#) is the 'fastest-growing waste stream in the world' with 44.7 million tonnes generated in 2016. That's the equivalent of 4500 Eiffel Towers. The UN warned of a 'tsunami of e-waste' in 2018, after reporting on some 50 million tonnes of e-waste globally. But despite these concerning numbers, human activity is causing the problem to grow rapidly.

The world will produce 75 million metric tonnes of e-waste by 2030 according to current estimates. The main reason for this is that [consumers prefer to buy new electronic devices](#) over repairing or prolonging the lives of old or existing ones.



Future projection of e-waste.

Source: [Forti et al., 2020](#)

How is Human Waste Killing Marine Life?

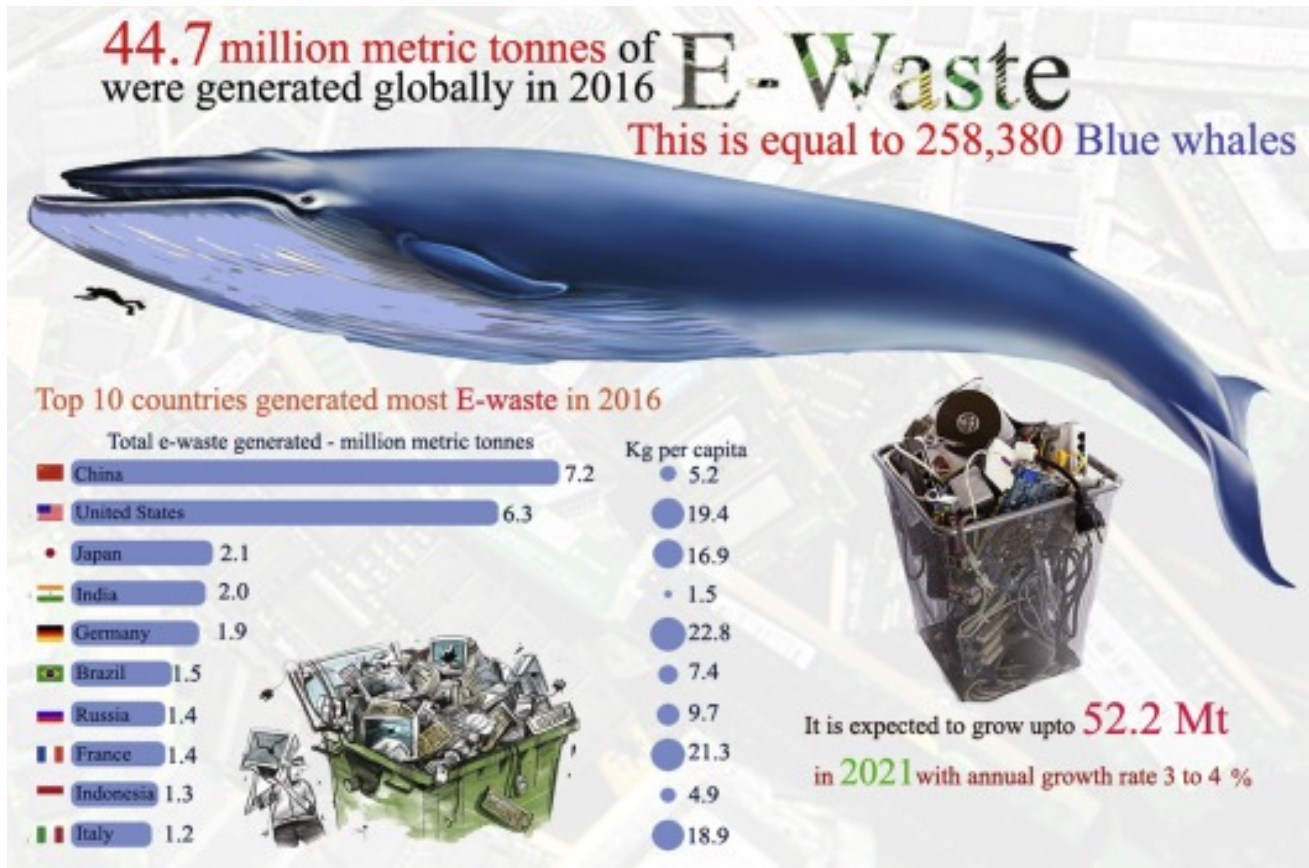
Nearly [20% of the anthropogenic waste](#) that ends up in the ocean is from ships and offshore platforms. The rest is trash carried by the wind, picked up by tides

on the beach, or intentional garbage dumping. Consequently, many marine animals end up ingesting this waste after mistaking it for food. It is estimated that [100,000 marine animal mortalities each year](#) are from plastic ingestion and entanglement.

Toxic chemicals from e-waste do not organically break down. Over time, these chemicals will seep from landfills into the soil and from there they contaminate groundwater. In addition, if electronic items are burnt, the release of toxins in these products into the atmosphere will return as [atmospheric fallout](#) and [acid rain](#).

The manufacture of electronic products also involves many [heavy metals](#), toxic substances, and hazardous chemicals. However, when they are no longer useful they often end up in landfills, incinerators, or dumped into waterways. These conditions are devastating to the environment. Heavy metals seeping from landfills include:

- **Lead**
- **Mercury**
- **Chromium**
- **Cadmium**
- **Polybrominated Diphenyl Ethers (PBDEs)**
- **Triphenyl Phosphate (TPP)**



Urban mining of e-waste: treasure hunting for precious nanometals.

Source: [Ramanayaka et al., 2020](#)

How Do We Stop It?

There are many measures that we can take on an individual, organisational, and legislative level. As individuals, we should avoid [single-use plastics](#) whenever possible and opt for more [eco-friendly solutions](#). People should also educate themselves about the recycling practices in their local area, and act accordingly. Organisations such as [The Ocean Cleanup](#) aim to use technological innovations to rid the oceans of plastic. Legislative measures are important to ensure that regulation curbs overfishing, harvesting and destructive fishing practices. Additionally, [implementing science-based management plans](#) could be the key to achieving ocean sustainability and preserving the marine environment.

does Killing Marine Life Impact Human Health?

More than 10 million tonnes of [plastic waste](#) enter the seas every year. Larger pieces kill [marine life](#), and most break down into microscopic particles containing

toxic chemicals – carcinogens, neurotoxins, and endocrine disruptors. Seafood consumers will eventually ingest these toxin-laden particles that accumulate in fish and shellfish.

[E-waste](#) is also hazardous to humans. Phones, laptops, and television sets contain metals and chemicals known to be harmful to human health. Communities in developing countries that live near e-waste recycling centres are particularly vulnerable. The [World Health Organisation](#) (WHO), in collaboration with the [National Institute of Environmental Health Sciences](#) (NIEHS) and other partners, recently launched an initiative to raise awareness and advance research on this emerging health threat, with a focus on how e-waste affects children's health. Through the [NIEHS-WHO](#) Collaborating Center, researchers are bringing together data, resources, and infrastructure to advance an international e-waste and children's health research agenda.



E-waste can seriously damage Human DNA and lead to an increased risk of cancer.

Source: [Treehugger](#)

This e-waste initiative was officially launched at the Pacific Basin Consortium for Environment and Health (PBC) in Hawaii in 2013. [Researchers](#) from the initiative found that e-waste pollution in the air can cause inflammation and stress in

workers who are exposed to it. Prolonged exposure can lead to heart disease, DNA damage, and cancer.

E-waste: why we need to act now.

Source: [YouTube](#)

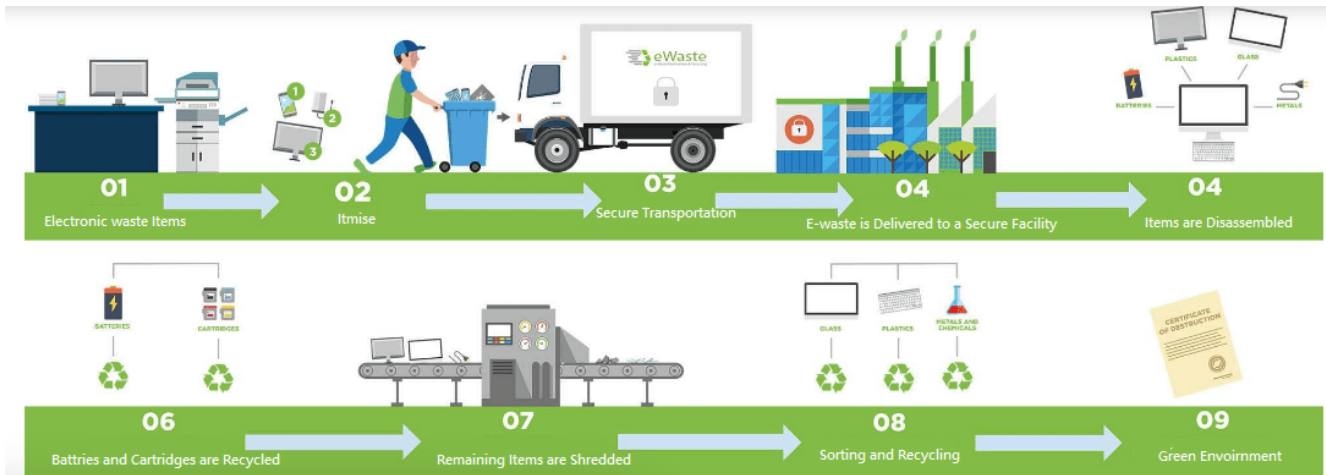
Why It's Important to Dispose of E-Waste Properly

Because [e-waste](#) is full of precious metals and materials, we must make an effort to recycle it. Recycling these aspects into materials that will be used to make smartphones and tablets is an essential part of the solution. Considering the value of these resources, the adverse health effects for humans and marine life, and the growing nature of the problem, proper disposal is more important than ever. Otherwise, we will lose these materials to landfills. [Recycling e-waste](#) saves these finite materials from the scrap heap. Instead, they are utilised in the form of new products and reducing our dependence on new materials.

The main reasons why we should dispose of e-waste responsibly

1. Owing to the negative impact on human health and marine life, keeping e-waste out of landfills is critical.
2. Electronic products are comprised of valuable materials including gold, silver, platinum, copper, aluminium, plastic, and glass.
3. Reclaiming valuable materials from the recycling process means there will be less demand for raw materials.
4. Using recycled material also helps reduce greenhouse gas emissions produced when manufacturing new products.
5. Discarded electronic devices can be refurbished, reused, and donated to others for use.

[E-waste](#) recycling has a strong bearing on our immediate environment, as well as the conditions for humans and life on Earth generally. It also promises significant economic returns at both local and national levels.



Processing and recycling of e-waste.

Source: [ECS Environment](#)

Moving Forward

Research on global plastic production and the accompanying environmental damage has shown that [plastic waste](#) constitutes a major environmental issue. The effect of plastic waste on marine organisms, humans, and the environment as a whole has prompted calls to salvage the ecosystems affected by this problem. Despite the usefulness of plastics in everyday life, the toxic chemicals used in the production process need to be closely monitored to achieve a healthy, sustainable, and thrivable world.

why should we focus on how Trashing the Ocean is Killing Marine Life?

The ocean is an essential part of the Earth's ecosystem. It serves as a marine habitat where marine life thrives, which nurtures marine biodiversity. It's also an energy source for human consumption and a giant [carbon sink](#) that helps stabilise the climate ([Pendleton et al., 2020](#)). The irresponsible dumping of anthropogenic materials into the ocean is killing marine life. This negatively impacts [marine biodiversity](#), in which many marine animals play a significant role in [marine carbon sequestration](#) that helps mitigate the effects of climate change ([Martin et al., 2021](#)).

Ocean trash, especially plastic, is killing marine life, including the largest marine mammals, through [entanglement and ingestion of plastic debris](#). The resulting

decrease in these populations has a cascading effect throughout the marine food chain. This endangers marine species and threatens [biodiversity and ecosystem services](#).

[Research](#) has shown that whales, as part of the [blue carbon](#) scheme, have great potential when it comes to removing carbon dioxide from the atmosphere. They play a crucial role in the [oceanic carbon cycle](#), have significant carbon-capturing potential owing to their huge biomass, and can take carbon dioxide out of the atmosphere for centuries after they die. They also stimulate phytoplankton growth through the [whale pump](#) process which contributes about [half of the Earth's oxygen](#). This is just one example that illustrates the devastating impact of polluting the ocean, which in this case threatens the survival of [keystone species](#). This, in turn, affects the subsequent biological processes which are critical in maintaining the marine ecosystem ([Ramade, 1997](#)).

Therefore, it is crucial to draw global attention and efforts to the issue of ocean trash that is killing marine life. The environmental benefits brought about by marine life concern the survival of humankind.

achieving the United Nations Sustainable Development Goals (SDGs) and how they link to the ocean and the killing of marine life

Following this, the UN has developed [SDG14: Life Below Water](#) to address and tackle ocean threats, promoting sustainable use of marine resources. To achieve one of the many targets listed under SDG14 to reduce marine pollution, it is of the utmost importance to raise awareness of the ocean trash that is killing marine life. Although multiple efforts to tackle the issue, including [marine protected areas \(MPAs\)](#), have been established, these have failed to protect against the impact of marine pollution ([Allison et al., 1998](#)). We must shift our focus to exploring alternatives like [marine spatial planning](#) as a management tool, as well as improving ocean literacy through education ([Ferreira et al., 2021](#); [Kirkfeldt & Santos, 2021](#)).

The connection between the ocean and the terrestrial ecosystem provides the

source for much of the pollution. Hence, [SDG15: Life On Land](#) is particularly relevant to this matter. As a major food source, the ocean could also be the key to alleviating food insecurity and world hunger. This will be in line with the mission to achieve the targets set out in [SDG2: Zero Hunger](#) so that all people have access to sustainably sourced, nutritious food.

A Thrivable Framework

To better shed light on not only the marine space but other environmental topics as well, [THRIVE](#) has a vested interest in the discourse surrounding the issue of sustainability. We are always seeking to advocate, promote, and act on its goal of leading the world to a sustainable and thrivable future. The concept around thrivability is to go beyond sustainability. Rather than striving simply to achieve survivability, THRIVE Project emphasises ensuring a future whereby mankind, nature, science, and all civilisation flourish in harmony and prosperity.

The topic of this article is a complex one, transcending the marine space, and reaching other areas of concern. THRIVE has the means to put a stop to ocean pollution and the killing of marine life. The THRIVE Framework, as a tool, is multidisciplinary and can pave the path forward through the integration of The 12 Foundational Focus Factors. These approaches that formed the framework are unique, in the sense that we measure sustainability performance through critical analysis and assessment of our impact on the planet.

Visit [THRIVE Project](#) for more information on how you can initiate change towards a more sustainable and thrivable future for all life on Earth. You can read our [blog](#) and tune in to our [podcast](#), both of which cover a range of topics relating to sustainability and thrivability. We also hold exciting [webinars](#) featuring expert guest speakers. Please [sign up for our newsletter](#) to stay updated.