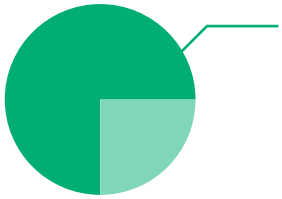
OPPORTUNITY #1

WHAT IF ALL WASTE WAS SAFELY DEGRADABLE?

PLASTIC EATERS

Bioengineered microbes and enzymes can break down all forms of waste, recyclable or not, reducing plastic pollution and improving quality of life and health



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WHY IT MATTERS TODAY

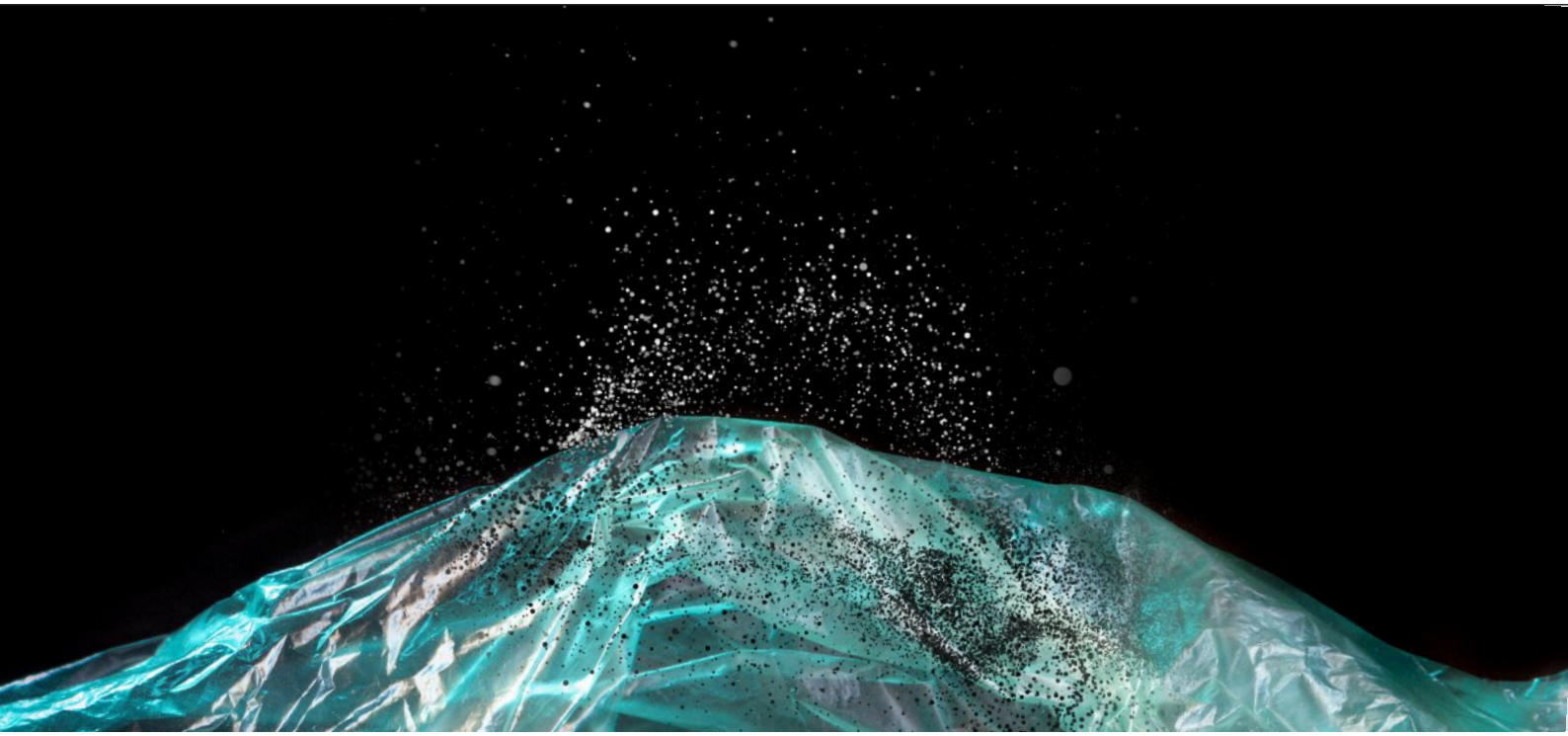
The world produces over two billion tonnes of waste each year.[1] The US Environmental Protection Agency estimates that about three-quarters of waste is recyclable but just under a third is actually recycled.[2] The greatest challenge is plastic waste which pollutes the ocean, harms marine wildlife and is detrimental to public health.

The economic cost of plastic pollution is $13 billion a year, including clean-up costs and financial losses to fisheries and other industries.[3] Microplastics are another problem, the bulk of these fragments being from car tyres that constantly produce microplastics as they wear down.[4] Initial surveys of microplastics in the air, water, salt and seafood have suggested that children and adults might ingest anywhere from dozens to more than 100,000 microplastic specks each day and people might be ingesting around the mass of a credit card's worth of microplastic a year.[5]

In the Arabian Gulf, plastic waste makes up as much as 16% of the public's trash – and that figure is growing. Meanwhile, the Middle East is responsible for about 8% of global plastic production.[6] The region loses out on $29 million[7] in annual revenues as a result of marine plastic pollution.

SECTORS

AGRICULTURE & FOOD · ADVANCED MATERIALS & BIOTECHNOLOGY · CHEMICALS & PETROCHEMICALS · CONSUMER GOODS · ENERGY, OIL & GAS · INFRASTRUCTURE & CONSTRUCTION · MANUFACTURING · METALS & MINING



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THE OPPORTUNITY TOMORROW

A low-waste society can be achieved through advances in biomaterials, which have exciting implications for industries from fashion to medicine and electronics to car manufacturing. New biodegradable or easy-to-recycle biomaterials can be used in a range of applications instead of metals and plastics. And, since the discovery of plastic-eating bacteria at a Japanese waste site in 2016,[8] the path to a low-waste society can be enhanced through bioengineered microbes and enzymes that digest plastic and other waste products.[9]

Advances in bioengineering and synthetic biology can also enable homes and buildings to be equipped with complete waste disposal systems that recoup energy and reduce materials to biodegradable or reusable components like 3D-printed fibres. They can eliminate harmful waste – such as microplastics – and the need for landfill sites and incinerators. Municipal waste systems can be redesigned to focus on collecting only valuable waste and managing unintended synthetic bio-organisms that may be released into the biosphere.

BENEFITS

People's quality of life and health improve as fewer pollutants enter ecosystems and energy is recovered for use in heat and power.

RISKS

Risks arise from the unintended toxicity of some waste elements or the build-up of toxic gases in disposal systems.