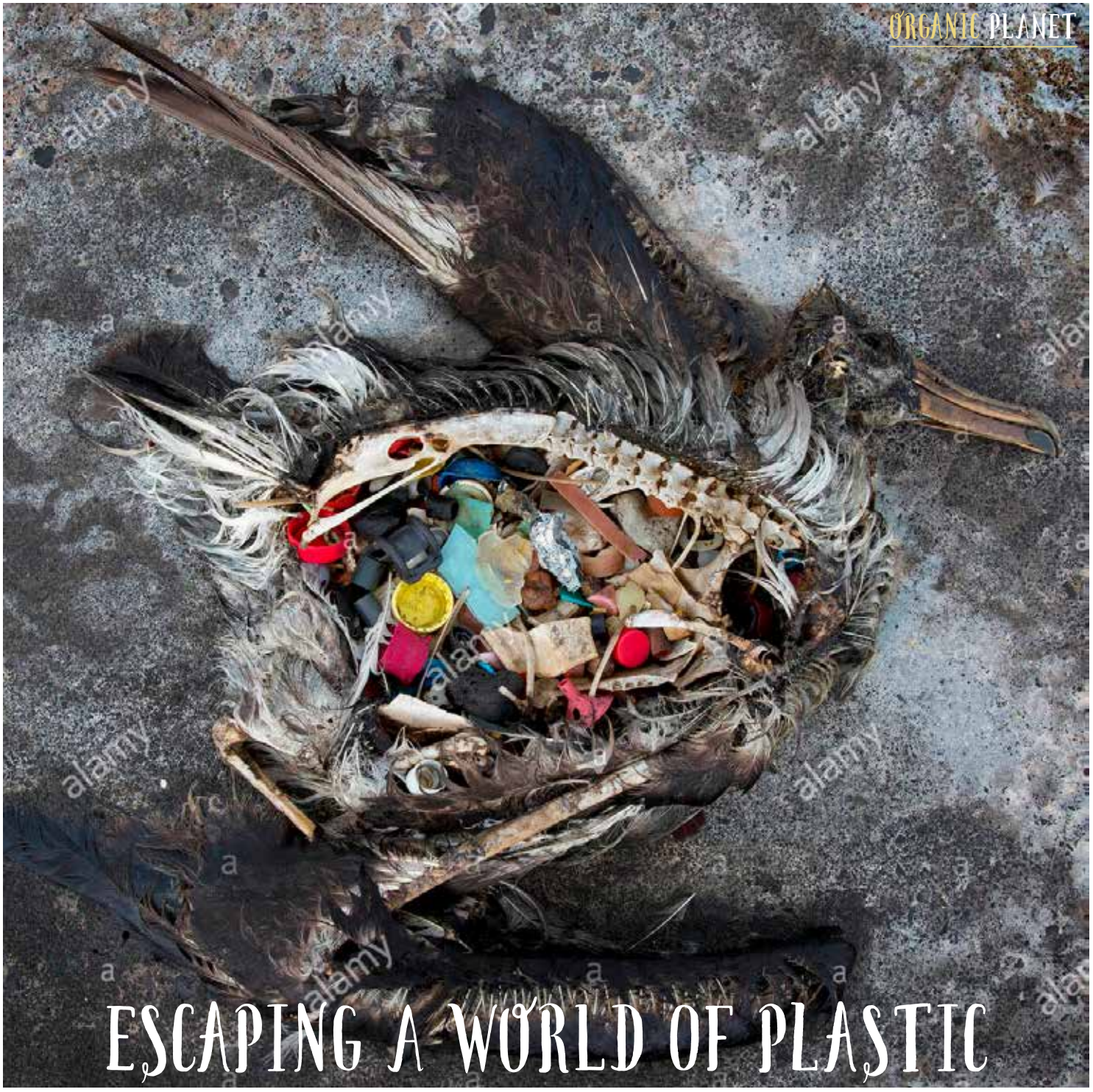


ESCAPING A WORLD OF PLASTIC

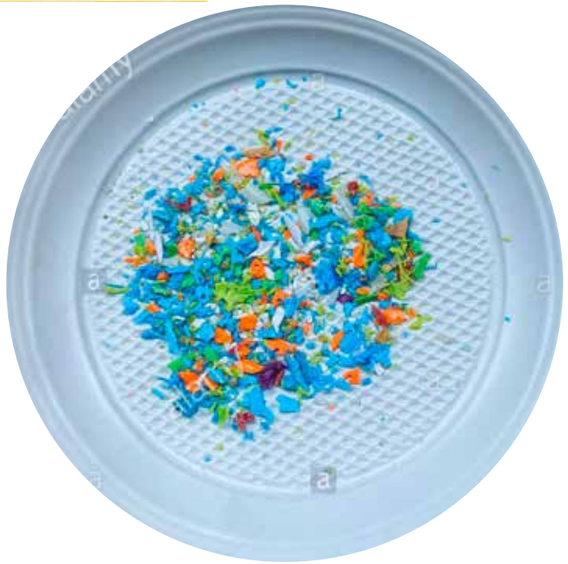
HOW DID WE GET CAUGHT UP IN THIS PLASTIC OVERLOADED WORLD AND WHAT ARE WE DOING TO ESCAPE IT, ESPECIALLY THE SCOURGE OF MICROPLASTICS? REESE HALTER REPORTS.

Plastics are malleable when treated under pressure, rigid and insoluble when cooled, highly moldable, more durable than ceramics, lighter than metal, electrically non-conductive and heat resistant. In this light, they seem a wonder product, but as we now know, they have a massive downside, being made from fossil fuels and polluting the environment and our bodies.

It wasn't until World War II that polyethylene (plastic bags, disposable bottles), propylene (bottle caps, fishing gear) and polystyrene (takeaway food containers) were invented and by the 1960s, being mass-produced. Today, almost 400 million tonnes of petroleum-based plastics are produced annually.

Almost 12 per cent of the world's petroleum (12 million barrels daily (mbd)) is poured into plastics. By mid-century, unless strong action is taken, that figure is predicted to grow to be almost 18 mbd.

PHOTO: ISTOCK



Above: We may not be eating chunks of plastic, but may be inadvertently consuming 5g of plastic each week.

Right: The plastic generated worldwide has been found in the stomachs of sea creatures.

Meanwhile, petrochemicals are expected to account for more than one-third of global oil demand growth by 2030 and about half of demand growth by 2050, according to the world's energy watchdog, the International Energy Agency (IEA). Already, an estimated 1 trillion plastic bags are manufactured each year (2 million every minute with each one having about a 15-minute working life).

A key reason why plastic products have taken over the planet is the subsidies given to the fossil fuel industry, which keep them cheap and ubiquitous. The International Monetary Fund (IMF) estimated that $5.3 trillion annually is given in direct and indirect subsidies by governments to the biggest, wealthiest, fossil fuel industry polluters.

Infuriatingly, if you care about the environment and the planet, these industries are not held economically accountable for the immense costs of plastic contamination of our waterways and oceans, wildlife and humans (see Circular Economy box on page 72).

Despite some progress on reuse and recycling, much of the plastics produced around the world are still winding up in the environment or landfills. According to the United Nations (UN), each year we dump about 1.9 billion tonnes of waste globally. Plastics have extremely strong carbon-carbon bonds with each other and take a very long time to breakdown. It means we are currently faced with a mounting crisis.

There are a multitude of reports now of the damage plastics are doing to our sea creatures, from harp seals in Scotland to hawksbill and olive ridley sea turtles in Kalimantan, who have stomachs

stuffed with hundreds of pieces of plastics and bitumen (petroleum).

Microplastic crisis

It's not just the disposability of plastics that are choking every living thing in the world. Tiny plastics, known as microplastics (<5mm), have been used for decades in the clothing, bedding and cosmetic industries. When clothes are washed or bodycare products washed off, microplastics detach and pass through the municipal water filtration systems and ultimately into the oceans or environment (in regional/rural centres they may also leach from domestic septic systems).

There are so many microplastics in the biosphere that scientists have detected them blowing onshore in sea spray and raining onto earth in Aquitaine (southwest France), London, the French Pyrenees mountains and along the US Southern Rockies. That means microplastics have infiltrated mountain streams and lakes, which feed towns and cities their

PHOTOS: ALAMY

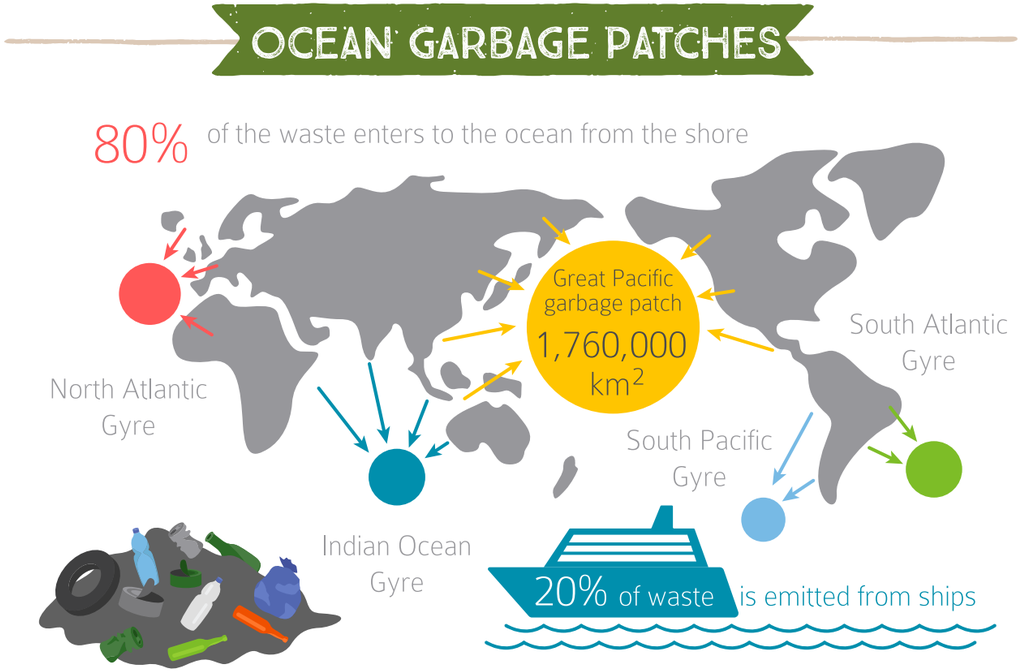


ILLUSTRATION: ISTOCK

daily drinking water. We know this because researchers at the Medical University of Vienna have reported on levels of infiltration into the human food chain. Microplastics have also made it to the depths of our oceans, such as the Mariana and Kermadec trenches, more than 10.5km beneath the Pacific surface.

Humans are also inadvertently consuming microplastics through leaching from water bottles, plastic packaging and more. We are all likely to be eating microplastics for dinner. A team of experts lead by Heriot-Watt University, Edinburgh, detected that widespread microplastic dust in our homes is contaminating each meal by as much as 114 particles. Per year, a person could consume as many as 68,415 individual pieces of plastic. A 2019 study from University of Newcastle (NSW) reported that worldwide people are unintentionally breathing, drinking and eating the weight of a credit card worth of microplastics (5 grams) weekly.

For those of you that still eat seafood, please take note: in 2020, microplastics were discovered in every single sample of wild blue crabs, oysters, farmed tiger prawns, wild squids and wild sardines purchased at a market in Queensland.

Removing plastic

There is a worldwide awareness that plastics are doing us in, especially in the oceans. The largest approximation of the enormity of the Great Pacific

The Great Pacific Garbage Patch is the largest of five plastic accumulation zones, all of which capture surface plastics in the area's circulating currents (called gyres).

Garbage Patch (floating collection of rubbish) could be 16 times bigger than estimated in 2018, which was a surface spread of around 1.6 million km² – an area spanning twice that of Texas with a weight equalling about 50,000 automobiles. Social media has helped awaken people to this hideous disposable plastic mess. Many groups and individuals are now helping to turn this around.

Dutch inventor Boyan Slat's non-profit entity, The Ocean Cleanup (theoceancleanup.com), has begun to tackle those large plastic pieces by working with the ocean gyres (circulating currents) to corral the surface pollution. His goal is to withdraw 50 per cent of the Pacific Ocean plastic every five years. Slat intends to release a fleet of plastic-removing vessels in every other ocean, too, where there are also enormous floating plastic islands.

Australia-wide, Sea Shepherd's marine debris campaign (seashepherd.org.au/our-campaigns/marine-debris-campaign), with its beach, river and remote clean-ups, has removed plastic from oceans and waterways. Sydney-based, Take 3 for the Sea (take3.org), has successfully incorporated their campaign into the school system. Take three pieces of plastic when you leave the beach, waterways – or anywhere – and you've made a difference. Kids get it!

Of course the more food you grow yourself and the more you cook, bake, preserve and bottle, the more you will avoid plastic entirely.

CIRCULAR ECONOMY

At its simplest level, the circular economy involves sustainable design and materials for products and services, then reuse, repurposing, repair and lastly recycling to create a closed loop system. It is based on using as few resources as possible in the first place and avoiding pollution, waste and greenhouse gas emissions wherever possible. It also puts the onus on manufacturers to take more responsibility for the lifecycle of products and do away with the deliberate design strategy of built in obsolescence.

As William McDonough, co-author of *Cradle To Cradle: Remaking the Way We Make Things*, has written: "Nature doesn't mortgage the future nor mine the past, but rather it operates from current income – solar rays."

So, at its heart, the circular economy is founded on following nature's flawless blueprint of no waste. In shaping this new economy, we need to curb the notion of unlimited growth. All resources are finite and our ultimate goal should be to produce safe, ecological and intelligent products with no poisons that leak into the biosphere.

Dealing with plastics and e-waste is a key step to implementing a global circular economy. In 2019, Europe had the highest upcycling rate of the total e-waste generated, 42.5 per cent. Asia ranked second with 11.7 per cent.

On the positive front in Australia, the federal government has devised a target to significantly lower landfills across Australia by 80 per cent by 2030. Instead of exporting 4.4 million tonnes (MT) to Asia (including 1.4MT of plastic, paper, glass and tyres), universities, TAFEs and industries will dovetail technology with the labour force in remanufacturing (reusing) centres.

You can find more about this in the January 2021 CSIRO report: 'Circular economy roadmap for plastics, glass, paper and tyres'.

Outlawing plastic

But the key is to stop plastic being made or getting into the environment in the first place.

By 2025, federal and state laws across Australia will have phased out the use of disposable cups, plates, cutlery, straws and single-use plastic bags. Most states have already clamped down on some plastic waste, including plastic cotton buds and microbeads ahead of the 2025 deadline.

The European Union (EU) is also intent on cleaning up the 25.4 million tonnes of plastic waste generated annually. As of July 3 this year, the EU has banned plastic bottle caps, cutlery, straws and plates, as well as styrofoam food and beverage containers.

Awareness campaigns to get people to switch to reusable water bottles, take their own cups for coffee, and remove single use plastic bags from supermarkets, have gone a long way to changing community attitudes and behaviour. There are even comments from Australian supermarkets about having all packaging recyclable.

Of course the more food you grow yourself and the more you cook, bake, preserve and bottle, the more you will avoid plastic entirely. There are plenty of waste-free living books now available to give guidance and inspiration.

The writing is on the wall for all these low hanging fruits such as plastic water bottles and takeaway food containers. Plant-based packaging materials based on potatoes, sugarcane, bamboo and others, biodegrade quickly. They are the future.

Change is in the air and not a moment too soon. It's now up to each of us to refuse plastics and reuse materials like glass and ceramics. Mother Earth, our brethren and sistren, the animals and children are counting on us to heal the planet. og

PHOTO: ISTOCK