A close-up photograph of a yellow rubber duck, a common toy, lying on a sandy beach. The duck is covered in sand and small pieces of debris, including what appears to be a piece of red plastic. The background is a blurred beach scene with more sand and some wooden sticks. The text is overlaid on the right side of the duck.

*If you drop
plastic in the
ocean,
where does it
end up?*

„Great Pacific garbage patch“
far bigger than imagined

If you drop plastic in the ocean, where does it

IT IS ESTIMATED THAT BETWEEN FOUR AND 12M METRIC TONNES OF PLASTIC MAKES ITS WAY INTO THE OCEAN EACH YEAR.

This figure is only likely to rise, and a 2016 report predicted that by 2050 the amount of plastic in the sea will outweigh the amount of fish.

The components of a bottle dropped in the ocean today could still be polluting the waters for our great-great-great-great-great-great-great-great-great-great-great-great-grandchildren.

A lot of plastic debris in the ocean breaks down into smaller pieces and is ingested by marine life, and it is thought that a significant amount sinks to the sea bed. But a lot of it just floats around, and thanks to sophisticated modelling of ocean currents using drifting buoys, we can see where much of it ends up.

Oceanographer Erik van Sebille, who works at Imperial College London and Utrecht University in the Netherlands, has shown that thanks to strong ocean currents known as gyres, huge amounts of plastic end up in six “garbage patches” around the world, the largest one being in the north Pacific.

The North Atlantic is home to another powerful current. Does someone know what happens to plastic debris that enters the ocean around New York? Initially a lot of it heads over to Europe, with concentration in the Bay of Biscay and, to a lesser extent, the North Sea, but the majority is trapped by the current and ends up floating in the middle of the ocean.

„A normal plastic bottle takes about 450 years to break down completely”

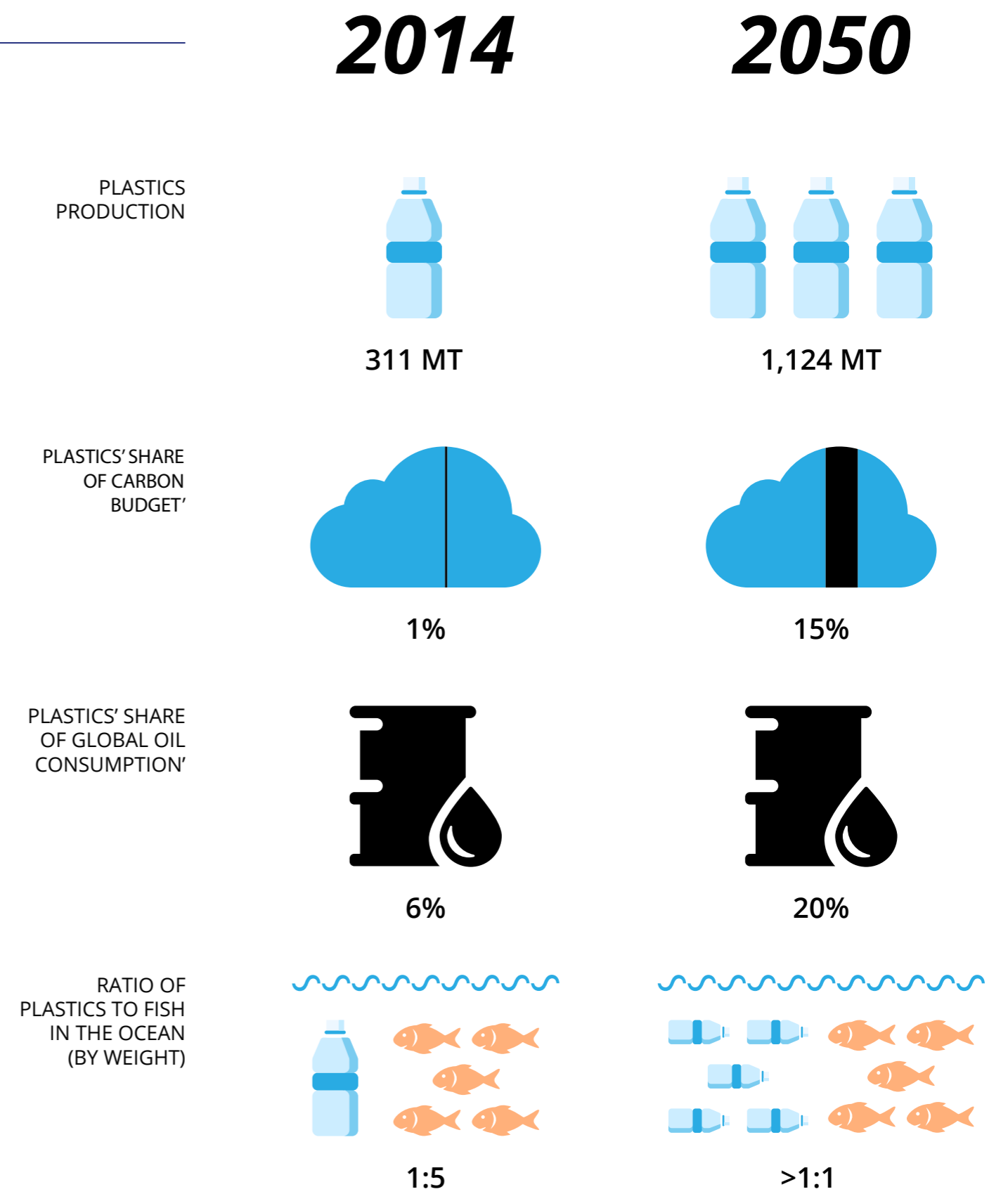
A bottle dropped off the Mexican coast, near Acapulco, is likely to be caught in the same gyre. Some of the plastic waste drifts south, but a huge amount is swept west towards Asia before floating north and ending up in the same area – the so-called Great Pacific Garbage Patch.

It’s a similar story in the UK. A bottle dropped in the sea off Cornwall may well be dragged through the channel towards Scandinavia, but the greatest concentrations are again in the Bay of Biscay and the western North Atlantic.

India is one of the world’s biggest plastic polluters, creating more than 15,000 tonnes of plastic waste a day.

More plastic than fish in the sea by 2050, says Ellen MacArthur

FORECAST OF PLASTICS VOLUME GROWTH, EXTERNALITIES AND OIL CONSUMPTION IN A BUSINESS-AS-USUAL SCENARIO



„Great Pacific garbage patch“ far bigger than imagined

The vast patch of garbage floating in the Pacific Ocean is far worse than previously thought, with an aerial survey finding a much larger mass of fishing nets, plastic containers and other discarded items than imagined.

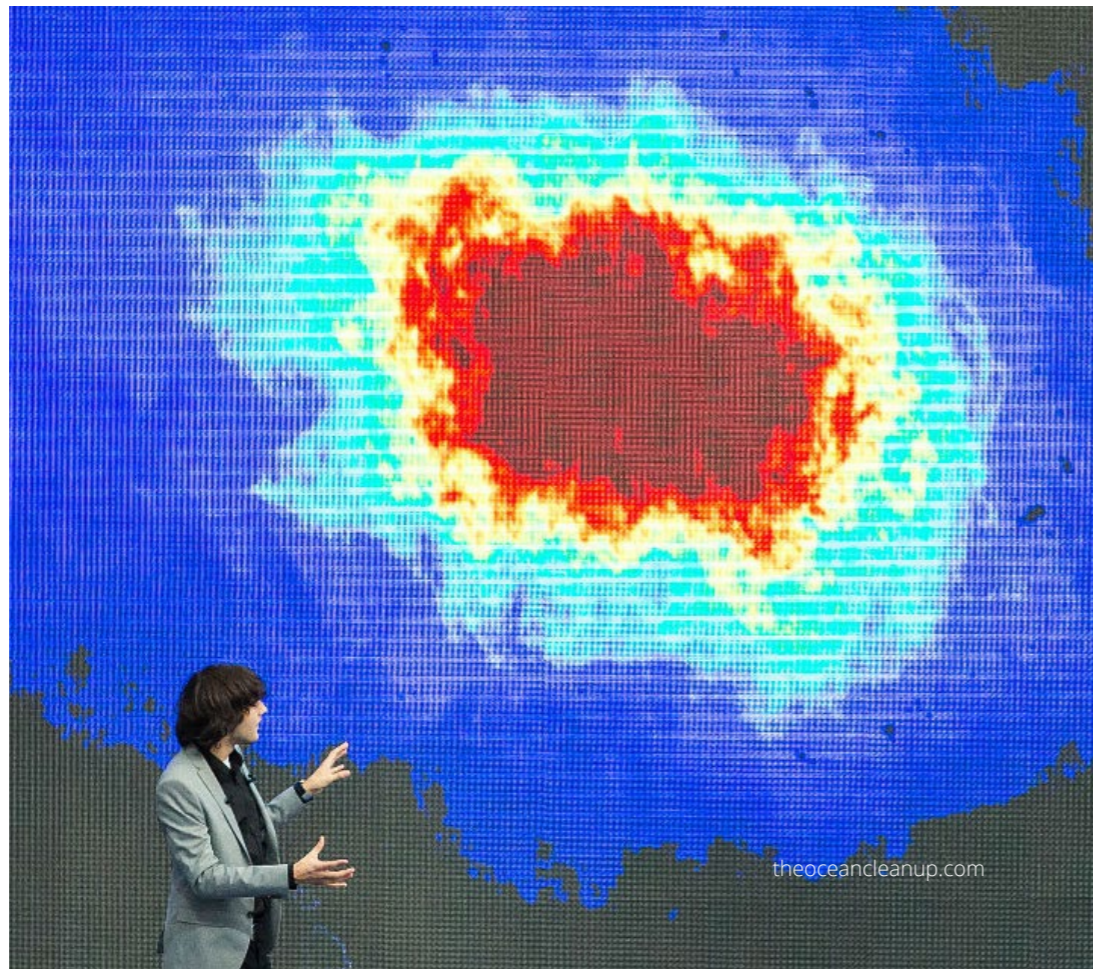
A reconnaissance flight taken in a modified C-130 Hercules aircraft found a vast clump of mainly plastic waste at the northern edge of what is known as the “great Pacific garbage patch”, located between Hawaii and California.

GIANT COLLECTION OF FISHING NETS, PLASTIC CONTAINERS AND OTHER DISCARDED ITEMS CALLED A ‘TICKING TIME BOMB’ AS LARGE ITEMS CRUMBLE INTO MICRO PLASTICS



far bigger than

“That was the plan for this survey. But then we opened the door and we saw the debris everywhere. Every half second you see something. So we had to take snapshots – it was impossible to record everything. It was bizarre to see that much garbage in what should be pristine ocean.”



theoceancleanup.com

The density of rubbish was several times higher than the Ocean Cleanup, a foundation part-funded by the Dutch government to rid the oceans of plastics, expected to find even at the heart of the patch, where most of the waste is concentrated.

“Normally when you do an aerial survey of dolphins or whales, you make a sighting and record it,” said Boyan Slat, the founder of the Ocean Cleanup.

The heart of the garbage patch is thought to be around 1m sq km (386,000 sq miles), with the periphery spanning a further 3.5m sq km (1,351,000 sq miles). The dimensions of this morass of waste are continually morphing, caught in one of the ocean’s huge rotating currents. The north Pacific gyre has accumulated a soup of plastic waste, including large items and smaller broken-down micro plastics that can be eaten by fish and enter the food chain.

According to the UN environmental programme, the great Pacific garbage patch is growing so fast that it, like the Great Wall of China, is becoming visible from space.

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Last year, the Ocean Cleanup sent 30 vessels to cross the patch to scoop up micro plastics in fine nets to estimate the extent of the problem. However, the new reconnaissance flights from California have found that large items of more than half a meter in size have been “heavily underestimated”. Slat said: *„Most of the debris was large stuff. It’s a ticking time bomb because the big stuff will crumble down to micro plastics over the next few decades if we don’t act.”*

Following a further aerial survey through the heart of the patch on Sunday, the Ocean Cleanup aims to tackle the problem through a gigantic V-shaped boom, which would use sea currents to funnel floating rubbish into a cone. A prototype of the vulcanized rubber barrier will be tested next year, with a full-sized 100km (62-mile) barrier deployed by 2020 if trials go well.

The Ocean Cleanup

The Ocean Cleanup is designing and developing the first feasible method to rid the world's oceans of plastic. Every year, millions of tons of plastic enter the ocean. A significant percentage of this plastic drifts into large systems of circulating ocean currents, also known as gyres. Once trapped in a gyre, the plastic will break down into microplastics and become increasingly easier to mistake for food by sea life.

Going after it with vessels and nets would be costly, time consuming, labor intensive and lead to vast amounts of carbon emission and by-catch. That is why The Ocean Cleanup is developing a passive system, moving with the currents - just like the plastic - to catch it.

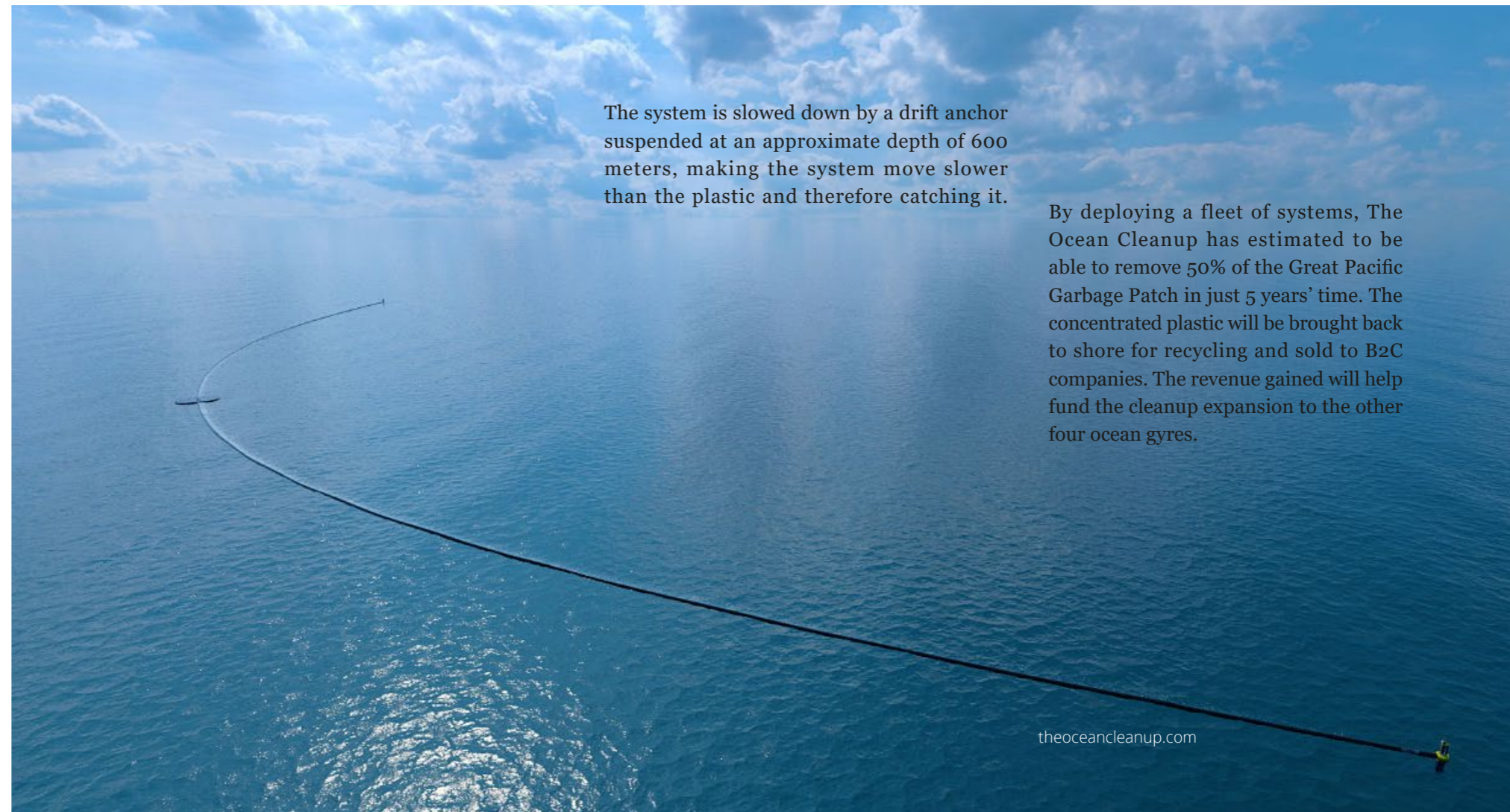
The Ocean Cleanup's passive system is comprised of a floater with a solid screen underneath, concentrating the debris and leading it to a collection system.

The boom will not be able to suck up all of the strewn rubbish, however, with Slat warning that plastic is "quite persistent. We need to clean it up, but we also need to prevent so much entering the oceans. Better recycling, better product design and some legislation is all part of that. We need a combination of things."

"For society to progress, we should not only move forward but also clean up after ourselves."

- BOYAN SLAT, CEO & FOUNDER

theguardian ■



The system is slowed down by a drift anchor suspended at an approximate depth of 600 meters, making the system move slower than the plastic and therefore catching it.

By deploying a fleet of systems, The Ocean Cleanup has estimated to be able to remove 50% of the Great Pacific Garbage Patch in just 5 years' time. The concentrated plastic will be brought back to shore for recycling and sold to B2C companies. The revenue gained will help fund the cleanup expansion to the other four ocean gyres.

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Newsletter

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