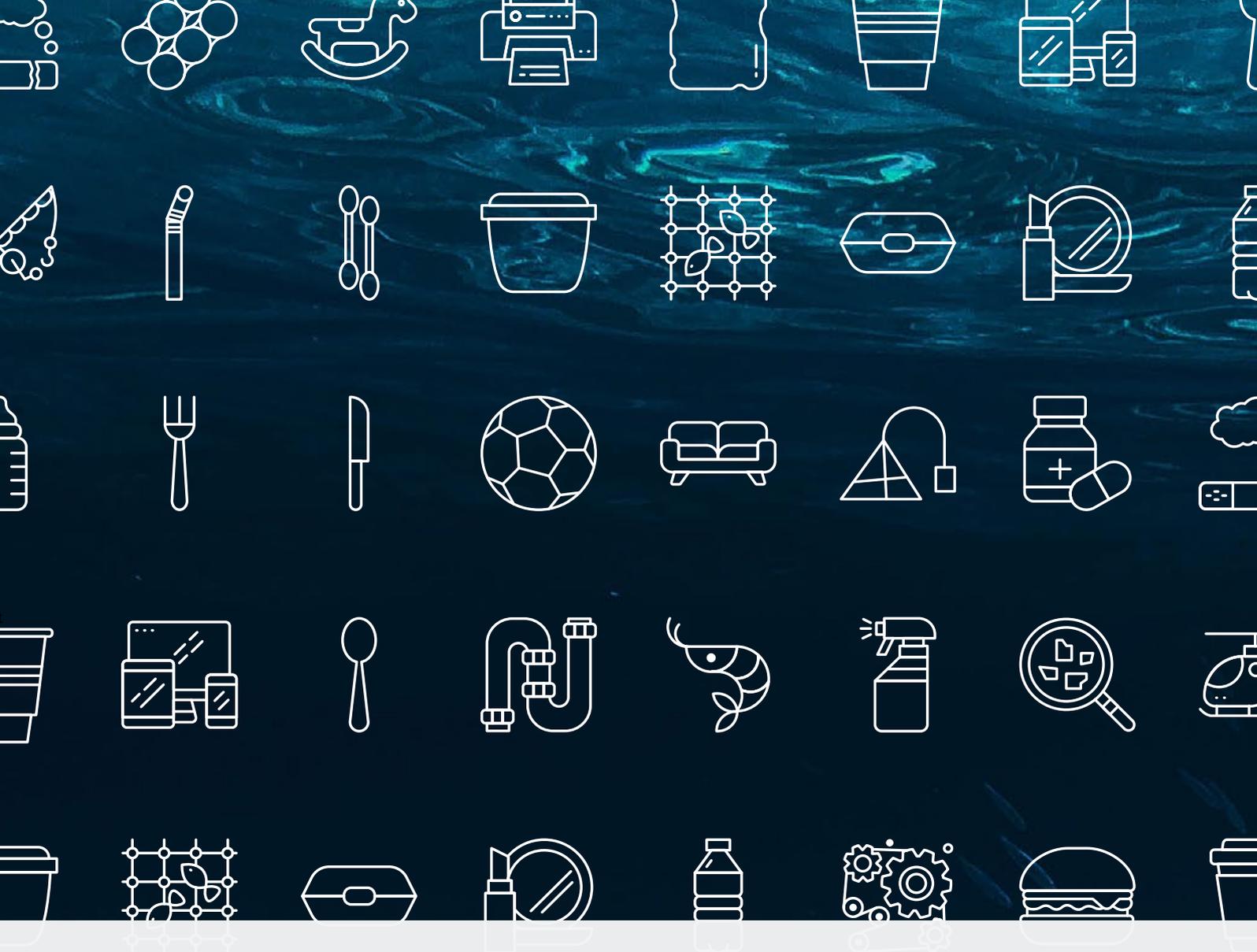




Unwrapping the risks of plastic pollution to the insurance industry

The first global insurance industry study on managing the risks associated with plastic pollution, marine plastic litter and microplastics



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Executive summary

Plastic is an increasingly high-profile threat to our climate, ocean, wildlife and human health. Its production has increased twenty times since 1964¹ and almost half of plastic produced is used just once before it is discarded.² The mountains of plastic waste generated by people, businesses, food production and almost every other sector of modern life are, on the whole, poorly collected and managed. As a result, plastic pollution is becoming widespread both in the ocean and on land, where it is impacting our ecosystems and threatening lives and human health.

To make matters worse, these plastics gradually break down into small particles known as microplastics. Microplastics are becoming so widespread in our environment that they have been found everywhere from bottled water to Arctic snow.³ Further research is needed to understand the impact of microplastics on nature and on human health, but many worrying effects have been found. For example, additives in plastics are known to disrupt animals' hormonal systems,⁴ and possible impacts on human health include lung inflammation, carcinogenicity, gene mutilation and repercussions for reproductive health.⁵

Furthermore, plastics make a direct contribution to climate change. Plastics, which are made from fossil fuels, account for 20% of total oil consumption⁶ and their manufacture, recycling and incineration is energy intensive, resulting in high carbon emissions.

Just like climate change-related risks, this study shows that plastic pollution risks can affect insurance and investment portfolios in the form of physical, transition, liability and reputational risks, as shown in the graphic on the following page. Risks ranging from threats to human health to evolving liability claims connected to marine litter and plastic pollution should be closely monitored by insurers in coming years.

At the same time, plastic pollution presents significant opportunities for insurers to position themselves on the frontline in tackling this global issue and helping to secure a more sustainable future. Many insurers have committed to promoting economic, social and environmental sustainability. Combatting plastic pollution and supporting shifts towards a circular economy should form an integral part of this.

This study identifies how risks related to plastic pollution play out across insurance lines and asset classes in which insurers invest. It argues that insurers should take an active role in addressing the risks related to plastic pollution and in contributing to global efforts to reduce it. In particular, insurers can consider the following approaches:

LEAD BY EXAMPLE

1. Introduce policies to reduce plastic use and waste internally
2. Include plastic pollution in ESG or sustainability approaches

UNDERSTAND, PREVENT AND REDUCE PLASTIC POLLUTION RISKS

3. Support knowledge and build awareness among the public, government and industry
4. Include plastic pollution risks in risk assessment models for insurance and investment activities
5. Develop relevant risk reduction measures
6. Reduce the plastic footprint of reinstating damaged property

INSURE RISKS ASSOCIATED WITH PLASTIC POLLUTION

7. Design innovative insurance products to cover the risks associated with plastic pollution

SUPPORT ALTERNATIVES TO PLASTIC

8. Support innovations for plastic alternatives through insurance products and investments

SUPPORT WIDER EFFORTS TO REDUCE PLASTIC POLLUTION

9. Actively engage with key stakeholders as risk managers, insurers and investors
10. Disclose plastic pollution risks and opportunities in relevant disclosure and reporting frameworks

1. World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics

2. Trucost (2016). Scaling Sustainable Plastics. Available at: rucost.com/publication/scaling-sustainable-plastics/

3. Melanie Bergmann, Sophia Mützel, Sebastian Primpke, Mine B. Tekman, Jürg Trachsel and Gunnar Gerdtz (2019). "White and wonderful? Microplastics prevail in snow from the Alps to the Arctic" in Science Advances Vol. 5, no. 8. Available at: <https://advances.sciencemag.org/content/5/8/eaax1157>

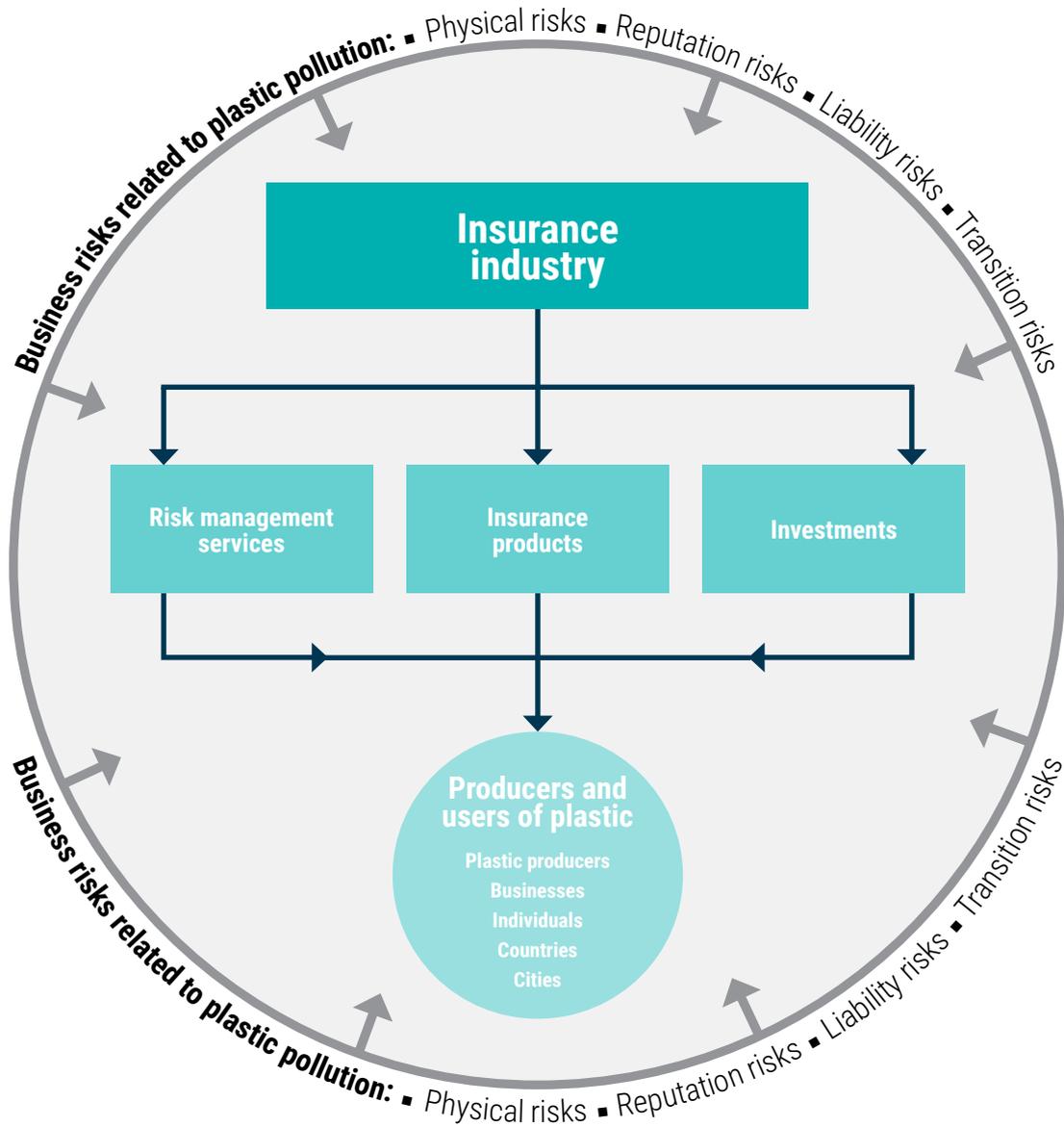
4. United Nations Environment Programme (2018). Plastic planet: How tiny plastic particles are polluting our soil. Available at: <http://www.unenvironment.org/news-and-stories/story/plastic-planet-how-tiny-plastic-particles-are-polluting-our-soil>

5. Johnny Gasperi, Stephanie L. Wright, Rachid Dris, France Collard, Corinne Mandin, Mohamed Guerrouache, Valérie Langlois, Frank J. Kelly, Bruno Tassin (2018). Microplastics in air: Are we breathing it in? Current Opinion in Environmental Science & Health, Volume 1, Pages 1-5. Available at: <https://www.sciencedirect.com/science/article/pii/S2468584417300119?via%3Dihub>

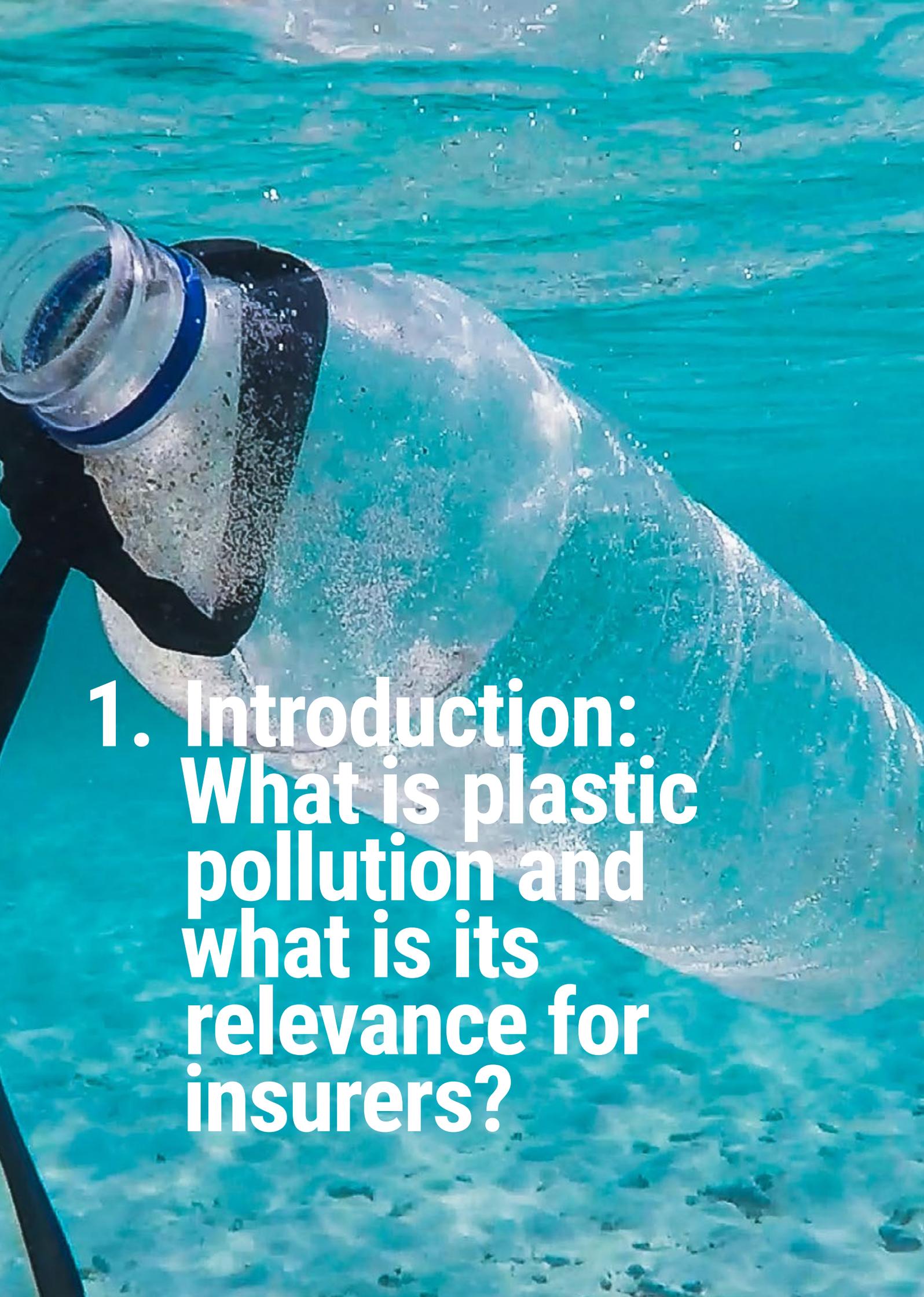
6. World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics



How the risks associated with plastic pollution affect the insurance industry and ten recommendations to manage those risks



Lead by example	Understand, prevent and reduce plastic pollution risks	Insure risks associated with plastic pollution	Support wider efforts to reduce plastic pollution
<ol style="list-style-type: none"> 1 Introduce policies to reduce plastic use and waste internally 2 Include plastic pollution in ESG or sustainability approaches 	<ol style="list-style-type: none"> 3 Support knowledge and build awareness among the public, government and industry 4 Include plastic pollution risks in risk assessment models for insurance and investment activities 5 Develop relevant risk reduction measures 6 Reduce the plastic footprint of reinstating damaged property investment activities 	<ol style="list-style-type: none"> 7 Design innovative insurance products to cover the risks associated with plastic pollution 	<ol style="list-style-type: none"> 9 Actively engage with key stakeholders as risk managers, insurers and investors
		<p>Support alternatives to plastic</p> <ol style="list-style-type: none"> 8 Support innovations for plastic alternatives through insurance products and investments 	<ol style="list-style-type: none"> 10 Disclose plastic pollution risks and opportunities in relevant disclosure and reporting frameworks



1. Introduction: What is plastic pollution and what is its relevance for insurers?



1.1 What is marine litter and plastic pollution?

Plastic has become ubiquitous in our lives. The material has many economic and social benefits and certain environmental advantages. It reduces food waste by increasing shelf life and protects vital medicines. Lightweight plastic packaging and plastics in vehicles reduce the fuel required to transport people and products. Yet, our use and disposal of plastic has become an increasingly high-profile threat to our climate, ocean, wildlife and human health.

Plastic production has increased twenty times since 1964⁷ and almost half of plastics produced are used just once before they are discarded.⁸ The mountains of plastic waste generated are, on the whole, poorly collected and managed. Between 1950 and 2017, just 9% of plastics were recycled, 12% were incinerated, and the remaining 79% can still be found in landfills or polluting the environment⁹ As a result, plastic pollution is becoming widespread both in the ocean and on land, where it is impacting our ecosystems and threatening lives and human health. Marine litter enters the ocean from both land-based and sea-based sources and a considerable proportion of all marine litter is plastic. This problem is only getting worse, with the amount of plastic in our ocean predicted to double between 2010 and 2025 if present trends continue.¹⁰

To make matters worse, these plastics break down into small particles known as microplastics. Microplastics are becoming so widespread in our environment that they have been found everywhere from bottled water to Arctic snow.¹¹ As a result, they are present in both the food we consume and the water we drink. Furthermore, plastic microbeads are present in a wide range of household products, from food products to cosmetics and toothpaste. Further research is needed to understand the impact of microplastics on nature and on human health, but many worrying effects have been found. For example, additives in plastics are known to disrupt animals' hormonal systems¹² and possible in humans, lung inflammation, carcinogenicity, gene mutilation and repercussions for reproductive health have been identified as possible impacts.¹³

Furthermore, plastics make a direct contribution to climate change. Plastics, which are made from fossil fuels, account for 20% of total oil consumption¹⁴ and their manufacture, recycling and incineration is energy intensive, resulting in high carbon emissions.



- 7 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: <https://www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics>
- 8 Trucost (2016). Scaling Sustainable Plastics. Available at: <https://www.trucost.com/publication/scaling-sustainable-plastics/>
- 9 The Atlantic (2017). Key information of plastic production and waste globally between 1950 and 2017. <https://www-statista-com.gate3.library.lse.ac.uk/statistics/728466/plastic-production-and-waste-worldwide-2017>
- 10 Peter Dauvergne (2018). Why is the global governance of plastic failing the oceans?, *Global Environmental Change*, 51, pp. 22-31.
- 11 Melanie Bergmann, Sophia Mützel, Sebastian Primpke, Mine B. Tekman, Jürg Trachsel and Gunnar Gerdtz (2019). "White and wonderful? Microplastics prevail in snow from the Alps to the Arctic" in *Science Advances* Vol. 5, no. 8. Available at: <https://advances.sciencemag.org/content/5/8/eaax1157>
- 12 United Nations Environment Programme (2018). Plastic planet: How tiny plastic particles are polluting our soil. Available at: <http://www.unenvironment.org/news-and-stories/story/plastic-planet-how-tiny-plastic-particles-are-polluting-our-soil>
- 13 Johnny Gasperi, Stephanie L. Wright, Rachid Dris, France Collard, Corinne Mandin, Mohamed Guerrouache, Valérie Langlois, Frank J. Kelly, Bruno Tassin (2018). Microplastics in air: Are we breathing it in? *Current Opinion in Environmental Science & Health*, Volume 1, Pages 1-5. Available at: <https://www.sciencedirect.com/science/article/pii/S2468584417300119?via%3Dihub>
- 14 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: <https://www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics>

1.2 What is the relevance of plastic pollution for insurers?

Current production, use and disposal of plastics present a considerable risk to the sustainability of our communities and economies. Risks associated with plastic pollution will impact on insurers' underwriting and the businesses that they invest in. Risks ranging from threats to human health to evolving liability claims connected to marine litter and plastic pollution should be closely monitored by insurers in coming years. Relevant risks are explored in detail in the following sections.

At the same time, plastic pollution presents significant opportunities for insurers to position themselves on the frontline in tackling this global issue and in helping to secure a more sustainable future. Insurance companies have a triple role as risk managers (physical risk management), insurers (financial risk management) and investors (investment management). Insurers' activities across each of these roles have a profound economic, social and environmental impact. Recognising their responsibility in wielding this influence, many insurers have committed to promoting economic, social and environmental sustainability—or sustainable development. Combatting plastic pollution and supporting shifts towards a circular economy should form an integral part of this. The following sections highlight ways in which insurers can promote efforts to reduce plastic pollution and support more sustainable use of plastics and plastic alternatives.

The first-ever global survey on insurers' attitudes to and actions to address plastic pollution risks, conducted as part of this study in 2019, found that less than a quarter of insurers consider plastic pollution risks explicitly in their environmental, social and governance (ESG), sustainability, underwriting or investment strategies. In most cases, where insurers are engaged with the issue of plastic pollution, they are working to reduce the plastic footprint of their internal operations or are tracking it as an emerging risk for their insurance underwriting and investments.

1.3 International efforts to combat plastic pollution

Combatting plastic pollution requires international cooperation due to the global nature of the problem. Marine plastic litter and microplastics from one country can end up on the shores of another and ocean pollution affects the entire globe. Initiatives have therefore been launched at the international level by the G7, G20, the UN, and in the context of the International Convention for the Prevention of Pollution from Ships (the MARPOL Convention), and Regional Seas Conventions and Action Plans. The Global Partnership on Marine Litter was established in 2012 upon request by governments to facilitate coordination and cooperation to reduce and prevent marine litter and microplastics. The UN Environment Assembly (UNEA)—the highest decision-making body at the global level on the environment—has consistently highlighted the issue of marine litter and microplastics through four resolutions on the topic as well as a resolution to address single-use plastics.

Reducing plastic pollution is vital to achieving many of the UN Sustainable Development Goals (Figure 1) such as Goal 3 on good health and well-being, Goal 6 on clean water and sanitation, Goal 11 on sustainable cities and communities, Goal 12 on responsible consumption and production, Goal 13 on climate action, Goal 14 on life below water, and Goal 15 on life on land.

Figure 1: The UN Sustainable Development Goals



International bodies have recognised the importance of the financial sector, including the insurance industry, in addressing plastic pollution. The Sustainable Blue Economy Finance Initiative, for example, was founded by the European Commission, European Investment Bank, UN Environment Programme (UNEP), World Resources Institute and WWF, and is hosted by the UNEP Finance Initiative (UNEP FI). The initiative helps financial institutions to invest in finance the ocean economy in a sustainable way and addresses plastic pollution as a key risk to our ocean. Now, UNEP’s Principles for Sustainable Insurance is examining how the insurance industry can best support this global effort to reduce marine litter, microplastics and plastic pollution in collaboration with the Global Partnership on Marine Litter.

1.4 The role of UNEP’s Principles for Sustainable Insurance Initiative (PSI)

As of November 2019, more than 140 insurance and stakeholder organisations have adopted the four Principles for Sustainable Insurance. This global framework, endorsed by the UN Secretary-General, is a commitment by the insurance industry to address environmental, social and governance risks and opportunities and to strengthen the industry’s contribution to building resilient, inclusive and sustainable communities and economies.

Through the PSI, this study represents the commitment of UNEP and insurers to tackle marine litter and plastic pollution. It is the beginning of what we hope will become a collaborative effort to establish concrete recommendations and innovative solutions to tackle this important threat to people and our planet.

1.5 Methodology

This study was carried out in order to understand how plastic pollution risks manifest across insurance lines and asset classes, and to identify strategies to enable the insurance industry to better manage plastic pollution risks.

It was completed in three phases:

- A literature review of materials related to plastic pollution and the risks it poses to the environment, the economy and our society
- Interviews with 19 insurers, reinsurers, brokers, regulators and non-governmental organisations (NGOs) to understand how these organisations currently view and respond to risks related to plastic pollution. The interviews were conducted with senior figures across the world, including in Africa, the Americas, Asia, Australasia and Europe.
- A survey completed by 86 insurance stakeholders in 28 countries to assess current levels of awareness of, attitudes to and actions to address plastic pollution risks. The majority of respondents (58%) were insurers, followed by reinsurers (14%) and NGOs (10%). The survey was also completed by brokers, regulators, insurance associations and universities and colleges.

This study is intended to help the insurance industry address the topic of marine litter and plastic pollution. It raises awareness of the importance of the risks marine litter and plastic pollution pose to the industry and provides initial indications on how the industry can respond.



2. The risks associated with plastic pollution

Fast fact:

Plastics are responsible for 20% of total oil consumption.



Plastic pollution is a material business risk that is relevant to insurers in all three of their roles— as risk managers, as insurers and as investors. This study categorises the risks associated with plastic pollution according to the taxonomy of business risks associated with plastic pollution developed by ClientEarth in the study, *Risk unwrapped: Plastic pollution as a material business risk*. This taxonomy is, in turn, an adapted version of the taxonomy of financial risks associated with climate change defined by the Bank of England and the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (TCFD).

The four categories used are physical, reputational, liability and transition risks. These risks are outlined below and their implications across insurance lines and asset classes are explored in more detail in the following chapters.

2.1 Physical risks

This category includes the risks of physical damage caused as a result of plastic pollution, including risks to human and animal health, to places, and to vessels and equipment. These risks have particular direct relevance to certain sectors, including fisheries and tourism. They also have direct consequences for human health and wildlife, which in turn impact on the health sector, governments, municipal management, and so on. As a result, physical risks brought about by plastic pollution may impact both on insurers’ underwriting business and on their investments. Physical risks relevant to insurers include:

- **The presence of microplastics in seafood, bottled water and other common products which could impact on human health.** Microplastics are present in a wide range of household products, from paint to personal care and cosmetics products. These tiny plastic fragments represent significant but poorly understood risks to human health, which could have implications for life and health insurers. These are particularly difficult for insurers to factor into their models due to the limited research and data available.
- **Carbon emissions as a result of the production, recycling and incineration of plastic.** Plastics are made from petrochemicals, which are derived from oil, and require energy-intensive production processes. As a whole, plastics are responsible for 20% of total oil consumption.¹⁵ Plastics are frequently overlooked in discussions around climate change, but in fact represent a sector with a high and growing carbon footprint.
- **Damage to ecosystems and biodiversity as a result of plastic pollution.** We know that plastics have devastating impacts on ecosystems, especially in the ocean. These in turn impact our planet’s biodiversity.
- **Damage to the health and quality of life of people, especially in coastal environments, exposed to plastic pollution.** Plastic and microplastic pollution pose risks both to human health and to quality of life, particularly for the large proportion of the human population that lives in and around coastal areas.
- **Loss of income and business opportunities due to tourist sites damaged by plastic pollution.** Tourist sites, especially beaches, are becoming increasingly polluted with plastic debris. This quickly reduces the attractiveness of these sites for tourists, in turn reducing the incomes and opportunities of businesses, small enterprises and workers who depend on them.
- **Economic impact on fisheries as a result of plastic pollution.** Fisheries are impacted economically by damage to vessels and to fishing gear caused by marine litter, by reduced catches as a result of ghost fishing (fishing gear abandoned at sea that continues to fish and trap animals), contaminated catches, and the time lost avoiding marine litter encounters.
- **Damage caused to marine vessels.** All marine vessels face risks as a result of marine litter, including collisions with cargo, entanglement of propellers, and uptake of plastics in cooling systems.

15 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: <https://www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics>



2.2 Reputational risks

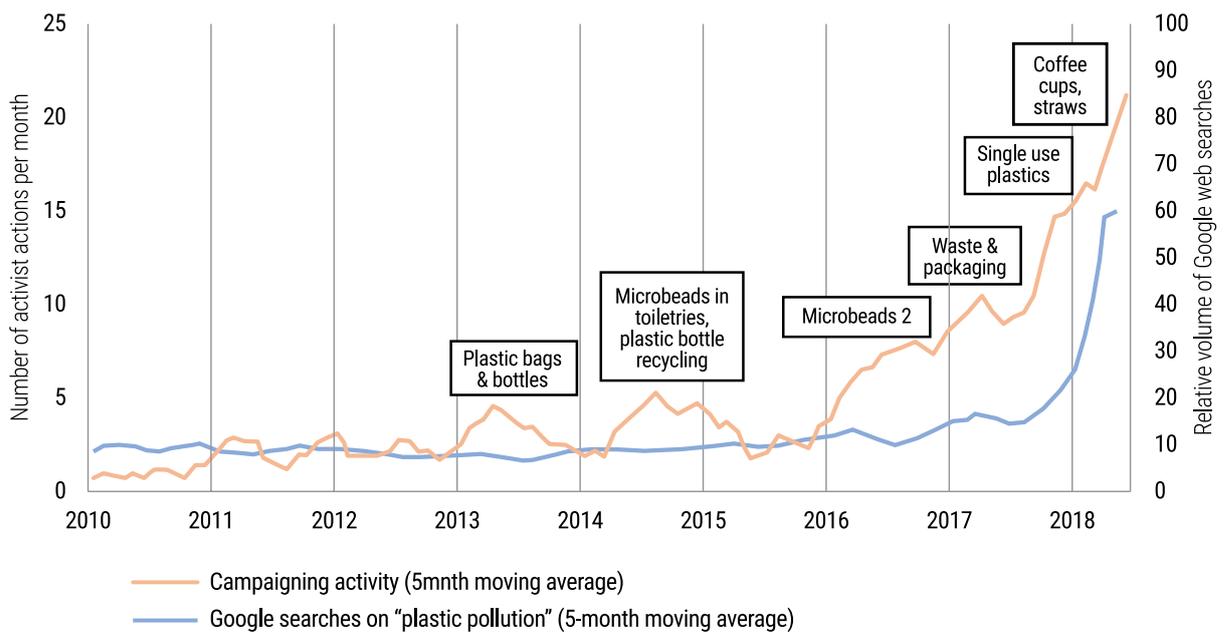
Insurers face both direct and indirect reputational risks as a result of plastic pollution. These include:

- **Reputational risks of transacting with businesses perceived as high plastic polluters or who are investors in high plastic polluters.** Insurance companies risk their reputation being damaged by their association with high plastic polluters, as a result of taking on these businesses as insured clients or choosing to invest in them. As public consciousness around plastic pollution increases, association with high plastic polluters may become a liability, as is already the case with coal, tobacco and damage to World Heritage Sites, for example.

This damage will likely be compounded by the increasing number of NGO campaigns around plastic pollution (see Figure 2), which often focus on prominent and well-known companies. Existing campaigns such as the Greenpeace campaign are already increasing pressure on household brands.¹⁶ As NGO approaches become increasingly sophisticated, they may also single out those insuring and investing in these companies.

In addition, if clients in certain sectors fail to adapt to changing public perceptions around plastics, these businesses may struggle in the future, resulting in reduced business for insurers underwriting and investing in these businesses.

Figure 2: Level of NGO campaigning and public interest (Google searches) in plastic pollution¹⁷



Source: SIGWATCH

16 Greenpeace (2018). Branded: In Search of the World's Top Corporate Plastic Polluters. Volume 1. Available at: <https://www.breakfreefromplastic.org/globalbrandauditreport2018/>

17 Jonathan Boyd (2018). The long arm of the NGOs. Investment Europe. Available at: <https://www.investment-europe.net/investmenteurope/opinion/3724065/arm-ngos>

- **Risk of staff dissatisfaction as plastic pollution becomes a topic of ever-higher public awareness.** Public awareness of plastic pollution is growing rapidly and, in many cases, company's efforts to reduce their internal plastic use have come about due to the insistence of staff. Those working in insurance are likely to become ever more conscious of the impact their companies have beyond their internal operations, through their underwriting and investment activities. Insurers who are perceived as ahead of the curve in tackling the issue may be able to benefit from this in attracting talent, whereas those who are slow to respond risk staff dissatisfaction.
- **Increasing investor awareness of sustainability issues and risk of divestment from high plastic polluters.** As investors start to pull away from investments in high plastic polluting companies, insurers run the risk that any investments in these companies will perform badly. Insurers may also find that their own shareholders may start to ask tougher questions about the company's plastic footprint, as well as its investments in and underwriting of high plastic polluters.

2.3 Liability risks

Liability cases around plastic pollution are likely to evolve as government and public perceptions of plastic pollution change. Insurers should be aware of the following risks:

- **Increasing exposure to liability claims for plastic pollution as public awareness and regulation change.** Businesses may face liability risks related to plastic pollution should individuals suffer damage as a result of plastic pollution and seek compensation from those whom they consider responsible. Although in many cases, it is difficult to link damage directly to the company responsible, it is possible that plastic producers and waste management companies could be vulnerable to future claims, especially as extensive plastic pollution clean-up is required. For example, where recycling companies pass materials to other countries for recycling and adequate recycling does not take place, liability claims could possibly be made. Companies providing products found to contain microplastics may also be vulnerable. As public awareness and political and regulatory environments evolve, liability cases against companies may be increasingly likely to succeed. We may see similar patterns to those seen in important past liability cases such as asbestos and smoking, where risks were not originally recognised and later resulted in very high losses for companies and their insurers.
On the other hand, opportunities may exist for insurers willing to innovate in new pollution products covering plastic and microplastic pollution as named perils.
- **Employers liability related to risks to human health to workers that come into frequent contact with plasticisers and other additives used in plastic production that pose a serious threat to human health.** As new evidence on the risks emerges, insurers underwriting employers' liability may be exposed to increased claims.
- **The risk of litigation for liability claims related to bodily damage caused by chemicals present in plastics.** Some of the chemicals used in plastics have been linked with bodily harm and it is possible that those who come into contact with these plastics could bring liability cases against the plastic producers or those that distribute plastics. For now, mass litigation has not come about because of the difficulties in linking specific bodily harms with exposure to specific chemicals. However, scientific investigation on these chemicals is evolving rapidly, and it may soon be possible to link specific chemicals in common plastic objects to specific bodily harm.

These risks are explored in more detail in section 3.6.



2.4 Transition risks

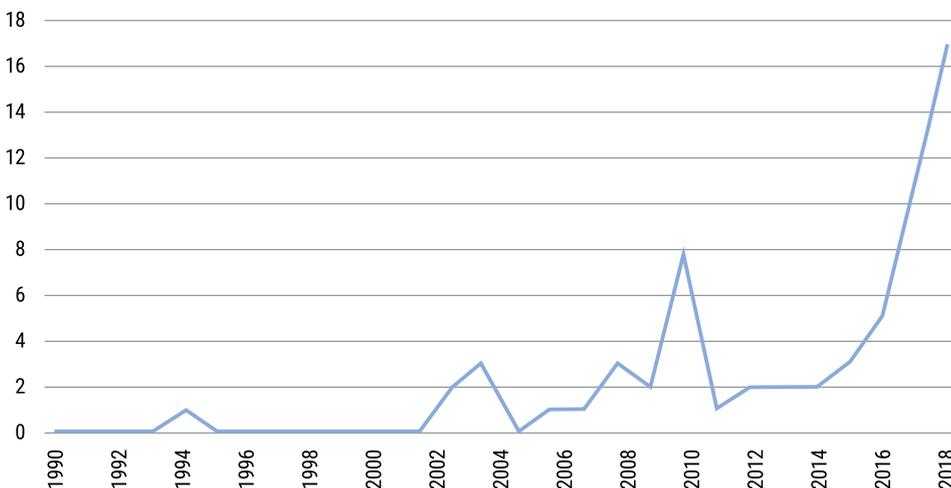
Transition risks may be the most pressing risks related to plastic pollution for insurers, their clients and investees. Single-use packaging alone has been estimated to be responsible for USD 40 billion in externalities (economic costs not borne by those responsible for causing them). This sum likely exceeds the total profits of the packaging industry.¹⁸ These costs are currently borne by nature and society, a situation that is increasingly recognised as both unfair and unsustainable. At the same time, governments are under pressure to find new ways to deal with plastics, at a time when doing so has become increasingly difficult and costly. Until 2017, China imported more than half of the world's plastic waste, but the country has now banned these imports. Developed countries, increasingly unable to export their plastic problem, will need to find better ways to deal with plastic waste within their borders. It is unlikely that they will be willing or able to take on all the costs of doing so, and companies will almost certainly be required to contribute in the future.

Legislators are in fact already making moves towards making producers of packaging and the companies using it responsible for the costs of waste management, following the "polluter pays" principle. In 2018, the European Commission proposed a plastic tax and a directive to regulate certain single-use plastics. Proposals for extended producer responsibility schemes were made to cover the costs of waste management, clean-up of litter and awareness raising measures to reduce litter. The European Union aims that, by 2030, all plastics packaging placed in the EU market is either reusable or can be recycled in a cost-effective manner.¹⁹ Warnings to businesses from the EU about the importance of moving away from plastic pollution and the penalties that they will face in the future for not doing so have been stark.²⁰ Such changes are taking place unevenly across the globe, but regulations to reduce plastic pollution waste have spiked in recent years (see Figure 3) and strong commitments have been made in many countries. India's Prime Minister, Narendra Modi, for example, has said that India will ban all single-use plastics by 2022.²¹

Fast fact:

Single-use packaging is responsible for an estimated USD 40 billion in externalities. This sum likely exceeds the total profits of the packaging industry.

Figure 3: Estimated number of new regulations on single-use plastics entering into force at the national level worldwide²²



Source: UNEP

- 18 Landon-Lane, M. (2018). Corporate social responsibility in marine plastic debris governance. *Marine Pollution Bulletin*, 127, 310-319.
- 19 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>
- 20 EndsEurope (2018). Brussels warns business over marine plastic litter. Available at: <https://www.endseurope.com/article/52729/brussels-warns-business-over-marine-plastic-litter>
- 21 Client Earth (2018). Risk unwrapped: plastic pollution as a material business risk. Available at: <https://www.documents.clientearth.org/wp-content/uploads/library/2018-07-24-risk-unwrapped-plastic-pollution-as-a-material-business-risk-ce-en.pdf>
- 22 United Nations Environment Programme (2018). Single-Use Plastics: A Roadmap for Sustainability. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/25496/singleUsePlastic_sustainability.pdf?sequence=1&isAllowed=y

Many leading industry figures believe that single-use plastics will eventually be banned and may already be reaching their peak.²³ Given this changing environment, insurers should monitor the following risks:

- **Regulatory or tax changes around plastic production, distribution, use, consumption and disposal.** The political and regulatory environment related to plastic is in a state of rapid change, along with public opinion, and companies are starting to face the financial risks of not being able to adapt quickly enough. RPC, a European packaging manufacturer, already lost more than a fifth of its value in 2018. The Financial Times reported that this was partly a result of concerns around potential regulation of plastic.²⁴ Insurers should consider how well-prepared their clients and investees are to handle this rapidly changing environment and support them to better manage these risks. They may also want to consider protecting their investments by moving them away from companies that are not making significant efforts to reduce plastic pollution.
- **Changes in customer demand as a result of greater public awareness of plastic pollution.** Regulatory changes, coupled with a more aware customer base, are likely to reduce demand for plastics, while also increasing the cost of many plastics and the products they are used in. This will have consequences for the profitability and business models of companies, particularly in plastic-intensive sectors.
- **New technological developments around reusable, bio-based and biodegradable materials, as well as innovative designs in reusable items, that may substitute plastics.** Technological changes and business innovations, such as reusable items and bio-based and biodegradable materials, will eventually take over a significant part of the current plastics market. As they do so, it is important to ensure that new materials biodegrade in the marine environment and do not have any negative environmental impacts. In some industries, shifts in technology and design have occurred surprisingly quickly. For example, a rapid increase has taken place in the use of menstrual cups, expected to reach a global value of USD 1.4 billion by 2023.²⁵ Insurers can take advantage of opportunities to offer relevant insurance for new products and business models, and to invest in innovations in this area.

Fast fact:

The total natural capital cost of plastic used in the consumer goods industry is estimated at over USD 75 billion per year.

Previous research from UNEP has identified the consumer goods sectors most exposed to transition risks related to plastics.²⁶ The study applies “natural capital valuation” to express the environmental and social impacts of plastics in monetary terms. This gives an indication of the financial costs to companies should they be forced to internalise the costs of the damage created by their activities. Investors are also exposed to these risks through the shares they own and project finance they provide to these companies.

The research identifies the total natural capital cost and percentage of revenue at risk in 16 sectors (see Figure 4). Overall, the total natural capital cost of plastic used in the consumer goods industry is estimated at over USD 75 billion per year, with food companies making the largest contribution. Companies in the toy, athletic goods and footwear sectors have the highest proportion of their revenues at risk, since they have the highest levels of natural capital cost per USD 1 million of annual revenue.

23 Client Earth (2018). Risk unwrapped: plastic pollution as a material business risk. Available at: <https://www.documents.clientearth.org/wp-content/uploads/library/2018-07-24-risk-unwrapped-plastic-pollution-as-a-material-business-risk-ce-en.pdf>

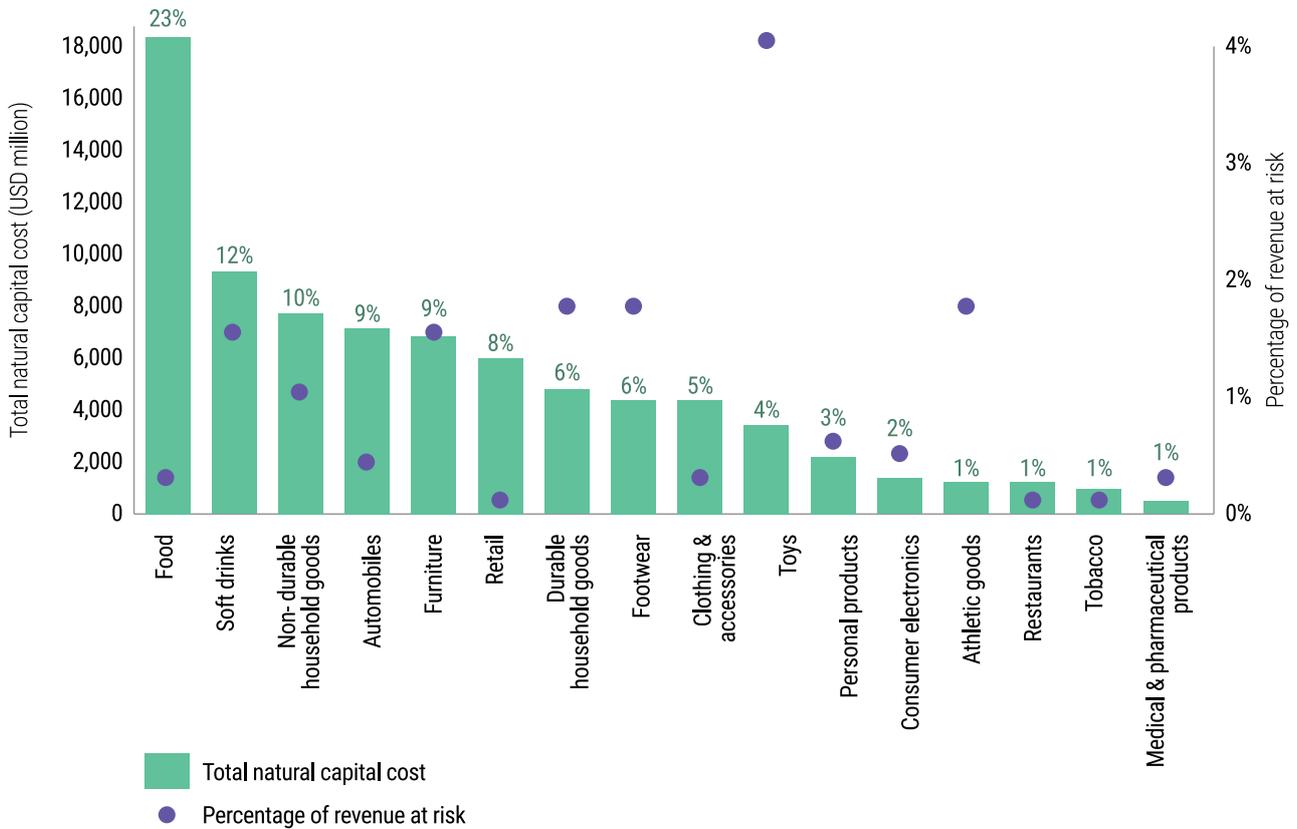
24 Financial Times (2018). RPC shares fall on concerns over cash conversion. Available at: <https://www.ft.com/content/33cb91ac-699c-11e8-8cf3-0c230fa67aec>

25 Reportlinker (2017). Menstrual cups market - global industry analysis, size, share, trends and forecast, 2015–2023. Available at: <https://www.reportlinker.com/p04828834/Menstrual-Cups-Market-Global-Industry-Analysis-Size-Share-Trends-and-Forecast-.html>

26 United Nations Environment Programme (2014) Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry. Available at: <http://wedocs.unep.org/bitstream/handle/20.500.11822/9238/Valuing%20plastic%3a%20the%20business%20case%20for%20measuring%2c%20managing%20and%20disclosing%20plastic%20use%20in%20the%20consumer%20goods%20industry-2014Valuing%20plasticsF.pdf?sequence=8&isAllowed=y>



Figure 4: Total natural capital cost and intensity of consumer goods sectors



Source: UNEP (based on Trucost calculations derived from World Bank, PlasticsEurope, Eurostat and US EPA datasets)

2.5 Insurers' current attitudes to plastic pollution risks

Across the range of risks mentioned above, insurers largely reported that their companies were aware of these risks and the majority (53%) had policies in place to reduce plastic pollution in their internal operations. However, most had not taken active steps to include plastic pollution considerations in their underwriting or investment policies. Many insurers stated that, although a few people within the company were conscious of the risks posed by plastic pollution to their business, awareness was not widespread in the business or systematised in any way.

The highest levels of awareness were found for physical risks, and the three risks that insurers were most aware of fell within this category of risks. They were:

1.	Damage to the health and quality of life of people, especially in coastal environments, exposed to plastic pollution
2.	Damage to ecosystems and biodiversity as a result of plastic pollution
3.	The presence of microplastics in seafood, bottled water, and other food products which could impact on human health

This likely reflects the fact that these represent immediate and tangible risks for insurers' business, especially for life and health insurers.

The lowest levels of awareness were found for transition risks, with the lowest level of awareness reported for the risk of regulatory or tax changes on plastic production, distribution, use, consumption and disposal. It is therefore important to increase awareness of this risk, because sweeping regulatory and tax changes could well be coming sooner than expected, with profound effects for insurers' clients and investments.

It is interesting to note that, when asked to prioritise risks according to their importance to the future of the company, insurers identified reputational risks as the highest priority for both underwriting and investment risks.

Overall, survey respondents ranked the risks in the following order when considering their insurance business :		Risks were ranked in the following order when considering their investment business :	
1.	Reputational risks	1.	Reputational risks
2.	Physical risks	2.	Liability risks
3.	Liability risks	3.	Physical risks
4.	Transition risks	4.	Transition risks

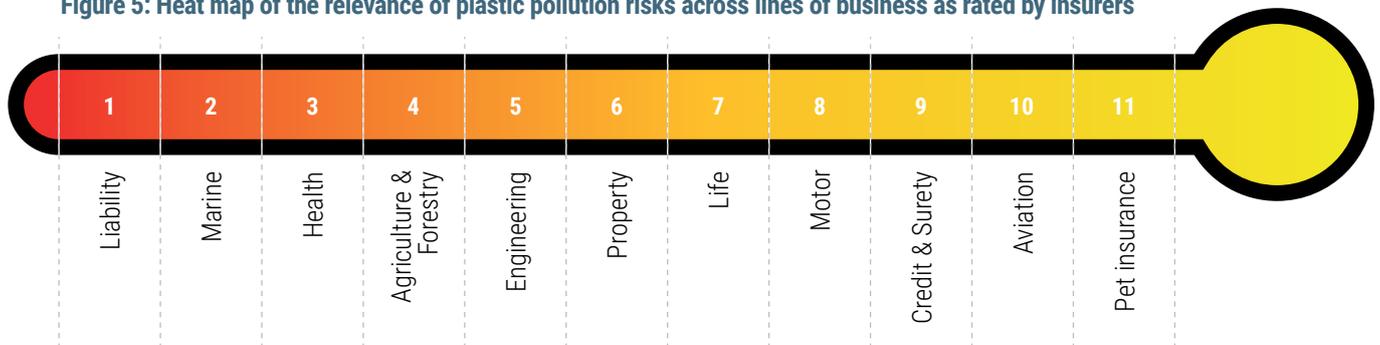
The prominence of reputational risks likely reflects insurers' recognition of the importance of their reputation to their long-term success. Again, we see that transition risks are not prioritised by insurers, perhaps due to limited knowledge of them. We hope that this paper will go some way to outlining why all these risk categories have important consequences for the insurance industry.

3. How plastic pollution risks play out across insurance lines



Risks associated with plastic pollution play out across insurers' major insurance lines. Insurers were asked to rate insurance lines according to the importance of plastic pollution risks in each case. Insurers rated the insurance lines in the order shown in the heat map below (Figure 5), with the first being most relevant to plastic pollution risks and the last being least relevant.

Figure 5: Heat map of the relevance of plastic pollution risks across lines of business as rated by insurers



Source: PSI global survey on insurers' attitudes to and actions to address plastic pollution risks

The potential impact of plastic pollution on each of these insurance lines is outlined below.

Fast fact:

Microplastic pollution on land is 4 to 23 times higher than at sea.

3.1 Agriculture & Forestry

The presence of plastic pollution in the ocean is well known, but plastic pollution on land is just as worrying. Researchers have found that microplastic pollution on land is 4 to 23 times higher than at sea, depending on the environment, and that this could be damaging these ecosystems.²⁷ Agricultural land is particularly likely to contain microplastic pollution if sewage sludge is applied to fields as a fertilizer, because of the high levels of microplastics found in sewage. The presence of microplastics may be damaging agricultural land and produce. For example, disease-causing organisms can be carried on the surfaces of plastic fragments, and microplastics also impact the functioning of soil fauna and, in turn, of soils. Various chemical properties of decomposing microplastics also have effects on organisms, possibly impacting the wildlife in and around agricultural lands.

Agriculture is also an important producer of plastic waste. Plastics have become ubiquitous on many farms—from hay bales wrapped in plastic and plastic bags used to store grain, to plastic mulch (plastic sheets used to heat soil and suppress weeds). The sector is therefore increasingly contributing to global plastic pollution, a problem which is impacting the farmers themselves, as well as the broader environment. In Texas, farmers are recognising and addressing the problems they face as a result of the disposal of plastic agricultural items, such as drip irrigation tubing.²⁸

Given their presence on farmland, microplastics are likely also consumed by farm animals. One study in Kenya found that around half of livestock in some parts of the country were ingesting plastic bags.²⁹ This is worrying because additives in plastics are known to disrupt animals' hormonal systems and nanoparticles have been shown to cause inflammation and to traverse cellular barriers.³⁰ All of these are potentially damaging for farm animals and possibly for people that eat meat and other animal products produced. This may in the future expose these businesses to livestock insurance claims as well as liability insurance claims, particularly, should existing levels of microplastic contamination in food be shown to be damaging to human health.



27 Anderson Abel de Souza Machado, Werner Kloas, Christiane Zarfl, Stefan Hempel, Matthias C. Rillig (2018). "Microplastics as an emerging threat to terrestrial ecosystems" in *Global Change Biology*. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.14020>

28 Green Source DFW (2015). Recycling agricultural plastic is growing industry. Available at: <https://www.greensourcedfw.org/articles/recycling-agricultural-plastic-growing-industry>

29 N.C. Lange, F. Inganga, W. Busienei, P. Nguru, J. Kiema and G Wahungu (2018). The prevalence of plastic bag waste in the rumen of slaughtered livestock at three abattoirs in Nairobi Metropolis, Kenya and implications on livestock health. Available at: <http://www.lrrd.org/lrrd30/11/clang30182.html>

30 United Nations Environment Programme (2018). Plastic planet: How tiny plastic particles are polluting our soil. Available at: <http://www.unenvironment.org/news-and-stories/story/plastic-planet-how-tiny-plastic-particles-are-polluting-our-soil>



International bodies and insurers are already concerned about excessive use of antibiotics in farming and the impacts on antibiotic resistance in human populations. Antibiotic resistance has been identified by the World Health Organization (WHO) as one of the biggest threats to global health, food security and development.³¹ Aviva Investors announced in 2017 that it was targeting 40 large food producing and retailing companies with high exposure to antibiotic resistance risks to encourage better practices around antibiotic use.³² As insurers tackle this problem, they cannot avoid the entangled issue of microplastic pollution. It is believed that microplastics may have a role in spreading the determinants of antibiotic resistance in water, since bacteria is able to survive longer on microplastics. Possibly as a result, researchers have found higher levels of antibiotic resistance in people who spend time in polluted coastal waters.³³ Therefore, insurers concerned about the impact of antibiotic resistance on both animal and human health should include microplastics in their considerations.

To date, not enough research has been carried out to be certain of the level of damage caused by the presence of microplastics in agriculture and forestry. In particular, forestry land could also be impacted by the presence of microplastic pollution though little research has been conducted on this. Nonetheless, important risks clearly exist and the insurance industry should be monitoring them.

Better management of plastic waste used in agriculture and forestry, and particularly the recycling of that waste, would help reduce plastic leakage in the environment. Certain countries have introduced Extended Producer Responsibility schemes that cover agricultural plastic products, and these have proven effective.³⁴ Biodegradable alternatives should also be considered for plastics used in agriculture, such as biodegradable plant pots already used in some countries. Insurers can engage with the agricultural sector to reduce its plastic use and better manage and recycle the plastics it does use, in an effort to help manage a risk with worrying consequences for farmers themselves.

3.2 Aviation

Aviation insurance includes insurance for airlines, airports, manufacturers of aircraft, ground operators and others. The direct impact of plastic pollution on these companies is limited, however their role in contributing to plastic pollution is considerable and particularly visible to customers. In particular, the high plastic waste generated by airline catering has come under considerable public criticism and has prompted at least one airline to go plastic free.³⁵ In addition, measures like pre-ordered meals only, being tested by Scandinavian Airlines and Delta Airlines,³⁶ help reduce overall packaging use and weight on flights.

It is possible that high plastic use, if it continues unchecked, could result in pollution liability cases. Furthermore, airlines are already facing the consequences of a growing anti-flying movement. Before the company collapsed in September 2019, Thomas Cook reported “a growing environmental movement against air travel” as one of the reasons for reduced demand in Northern Europe in its half year results.³⁷ With the public increasingly conscious both of airlines’ carbon footprint and of its plastic waste, excessive use of plastic will likely encourage this anti movement. This could result in loss of profits for the aviation industry, especially for those unable to demonstrate that they are reducing their environmental footprint, including their plastic footprint. This may affect aviation insurers as well as any insurers with investments in the sector.

31 The World Health Organization (2018). Antibiotic resistance. Available at: <https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>

32 Aviva (2017). Fighting antibiotic resistance. Available at: <https://www.aviva.com/social-purpose/our-stories/antibiotic-resistance/>

33 Maria Belén Sathicq (2019). Microplastics: their role in the spread of antibiotic resistance. Available at: <https://www.axa-research.org/en/project/maria-belen-sathicq>

34 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

35 Annabel Fenwick Elliott (2019). The world’s first plastic-free flight is here – but will other airlines follow? Available at: <https://www.telegraph.co.uk/travel/news/hi-fly-airline-first-to-ban-single-use-plastic-on-flights/>

36 Aeroplate (2019). Plastics in Airline Catering Raise Questions About Carbon Emissions. Available at: <https://aeroplate.global/news/27/Plastics%20in%20Airline%20Catering%20Raise%20Questions%20About%20Carbon%20Emissions>

37 Thomas Cook Group (2019). Thomas Cook Group Half Year Results 2019. Available at: <https://www.thomas-cookgroup.com/news/16052019/thomas-cook-group-half-year-results-2019?ref=Home>

In addition to changing public opinion, aviation is one sector that has been identified as likely to be more closely regulated in the future due to its environmental impact. In Europe, for example, plans are being considered for a fuel tax to cut carbon emissions.³⁸ It is therefore important for aviation businesses to make moves towards greater environmental sustainability, including reducing their plastic footprint, before they are pushed.

Beyond plastic use onboard airlines, aviation insurers can also encourage greater use of recycled and recyclable plastics in the manufacture of aircraft, similar to measures that have already been used in motor insurance.

3.3 Credit & Surety

The PSI study, *The 4th factor: Underwriting for sustainable development in surety bonds*³⁹ set out the importance of including ESG risk factors in underwriting surety bonds for infrastructure projects, due to the importance of ESG risks, both related to the contractor and the environment, in determining the positive outcomes of infrastructure projects.

The ability of those leading infrastructure projects to manage their use, disposal and recycling of plastic will have important consequences on the environmental results of the project. Plastic use and waste management should therefore be integrated into the ESG analysis of surety bonds. Where infrastructure projects will create plastic waste or use plastics in their construction or maintenance, contractors should be asked to provide information on how that plastic waste will be managed, plans for recycling plastic waste, and how the project will reduce plastic use and maximise the use of recycled and recyclable plastics. The case study below from Munich Re demonstrates how insurers can influence waste management through their role in providing surety bonds.

Munich Re:

Impacting waste management through surety bonds⁴⁰

In determining whether to provide insurance coverage for the construction of a hydroelectric power plant, Munich Re considered the environmental and safety risks as well as the project's impact on local communities. At the pre-construction stage, no environmental or social issues were identified.

During construction, Munich Re's risk engineers visited the site regularly to monitor conditions. It was during these visits that they noticed issues related to safety and waste management, which had the potential to jeopardise the workers and the project.

Munich Re raised its concerns with the construction company, but the conditions did not improve. Therefore, Munich Re decided to collaborate with the finance providers—the insurance cover was mandatory for the credit lines—to demand improvements from the construction company.

This collaboration between insurance and finance providers increased the pressure on the construction company and significant improvements at the site were observed.

38 Euronews (2019). Climate change: Aviation fuel tax would cut CO2 & not hit jobs, leaked EU Commission report finds. Available at: <https://www.euronews.com/2019/05/13/climate-change-aviation-fuel-tax-would-cut-co2-not-hit-jobs-leaked-eu-commission-report-fi>

39 United Nations Environment Programme (2018). The 4th Factor: Underwriting for Sustainable Development in Surety Bonds. Available at: <https://www.unepfi.org/psi/wp-content/uploads/2018/07/SURETY-BONDS.pdf>

40 Case study from: United Nations Environment Programme (2018). The 4th Factor: Underwriting for Sustainable Development in Surety Bonds. Available at: <https://www.unepfi.org/psi/wp-content/uploads/2018/07/SURETY-BONDS.pdf>



3.4 Engineering

Engineering insurance covers the risks involved in constructing and installing buildings, factories, infrastructure, machinery, and so on. Construction and installation can be put at risk if an environment is polluted with plastic waste. For example, installing or upgrading water and waste infrastructure can be affected by plastic waste entering the system and clogging it.

Even where plastic waste does not directly affect an engineering risk, an insured project is likely to produce plastic waste and make use of plastic construction materials and equipment. Insurers can engage with clients to ensure that the plastic waste produced during construction is adequately dealt with and does not result in plastic pollution in the surrounding area and waterways.

Given their role insuring electronic equipment, engineering insurers should also consider the environmental impacts of electronic waste. Plastic has electrical insulation properties and is low-cost, lightweight and durable. As a result, electronics contain high quantities of plastics. Electronics are regularly updated and rapidly discarded, generating an enormous electronic waste problem. In fact, electronic waste is now the world's fastest-growing solid-waste stream and only around 20% of electronics are properly recycled.⁴¹ Insurers can support the efforts of electronics manufacturers, governments and of global bodies (including members of the recently formed E-waste Coalition⁴²) to reduce electronics waste and promote recycling. Engineering insurers can investigate ways to emphasise repairing and upgrading, as well as better disposal and recycling, when they receive claims for broken electronics. Furthermore, they can encourage clients to purchase electronics made with recycled plastics and other recycled materials and to ensure that electronic waste is always carefully managed and not simply disposed of together with other waste.

In terms of equipment and breakdown insurance (also known as boiler and machinery insurance), the machinery, plants and equipment covered by engineering insurance may all contain plastic parts. Engineering underwriters may assess the materials used in order to price a risk. For example, engineering underwriters might look into whether plastics used are fire-resistant. This provides an opportunity for engineering insurers to also engage with their clients on increasing the use of recycled plastics as well as using plastic parts which can be more easily recycled or repaired. Furthermore, where insurers replace broken machinery, they can look into reusing parts and making use of recycled plastic where possible, as well as ensuring the waste from broken machinery is separated for recycling.

Where engineering insurance is provided for the construction of new plastic manufacturing plants or for waste management or recycling facilities, insurers have an additional opportunity to influence plastic manufacturing and waste management. The possibility of engaging with these types of businesses is explored further in section 5.7.

3.5 Health

Plastics pose an important threat to human health. The World Economic Forum included plastic pollution in its *Global Risks Report* in 2018, noting the possibility that microplastics are making their way into the human body and bringing toxic chemicals with them.⁴³

Microplastics ingested by marine wildlife enter the food chain and accumulate as they move up the chain, meaning that they can be present in the food we eat. In addition, microplastics have become pervasive across the world, and have been shown to already contaminate the water we drink and the air we breathe. Although research on the effects of our exposure to microplastics is not yet conclusive, possible impacts may include lung inflammation, carcinogenicity, gene muti-

Fast fact:

Electronic waste is now the world's fastest-growing solid-waste stream.

41 C. P. Baldé, V. Forti, V. Gray, R. Kuehr, P. Stegmann. 2017. The Global E-waste Monitor 2017. Quantities, Flows, and Resources. United Nations University (UNU), International Telecommunication Union (ITU) & International Solid Waste Association (ISWA), Bonn/Geneva/Vienna. Available at: <http://ewastemonitor.info>

42 United Nations Environment Programme (2019). UN report: Time to seize opportunity, tackle challenge of e-waste. Available at: <https://www.unenvironment.org/news-and-stories/press-release/un-report-time-seize-opportunity-tackle-challenge-e-waste>

43 World Economic Forum (2018). The Global Risks Report 2018: 13th Edition Insight Report. Available at: http://www3.weforum.org/docs/WEF_GRR18_Report.pdf

Fast fact:

Microplastics are intentionally added to many common products including paint, personal care products and cosmetics.

lation and repercussions for our reproductive health.⁴⁴ Certain chemicals present in plastics have specifically been linked to women's health problems, particularly breast cancer, as well as male reproductive health problems.⁴⁵

Furthermore, plastics are intentionally added to many everyday products, like cosmetics and toothpaste, in the form of microbeads. These are absorbed through the skin and inhaled. Given that microbeads are commonly used in personal care products more frequently used by women, women may be particularly at risk.

As more research is carried out, scientists are constantly finding new threats to human health as an indirect impact of plastic pollution. For example, scientists have found that microplastics in the ocean facilitate the spread of antibiotic-resistant bacterial genes, which impact on the evolution of aquatic bacteria and, in turn, pose a hazard to human health.⁴⁶ Life and health insurers should be concerned by the existence of a poorly understood and under-researched, yet potentially devastating, threat to human health.

Given the potential knock-on effects of increased claims for life and health insurers, it is in insurers' interest to support further research into this topic, support reduced plastic pollution wherever possible, and support mechanisms that allow consumers more informed choice about the level of microplastics in the food and water they consume. Health insurers are increasingly focused on informing, incentivising and facilitating clients to take preventative action to improve their health on topics like healthy food choices and exercise. In general, the risks of microplastics do not yet feature on this agenda. However, by building awareness among clients about the risks of microplastics and actions they can take to lower their exposure to microplastics, insurers can both help their clients protect their health and contribute to growing public awareness on this issue. Insurers can recommend customers use tools such as the *Beat the Microbead* website and app,⁴⁷ as well as looking out for the *Zero Plastic Inside* logo, which both help consumers identify cosmetics and personal care products free of plastic microbeads. They might also recommend that their customers install a water filter. Additionally, insurers could support further research and the development of new tools to help consumers avoid consuming microplastics. Such efforts also increase general public awareness and in turn contribute to positive government and industry decisions to reduce plastic pollution.

3.6 Liability

General liability insurance

Businesses may face liability risks related to plastic pollution should individuals suffer damage as a result of plastic pollution and seek compensation from those whom they consider responsible. Such cases have so far been limited by difficulties linking damage directly to the company responsible. Furthermore, most insurers would consider plastic pollution to be excluded from the vast majority of general liability products because these products generally have a clause which excludes pollution. However, these exclusions do not generally specifically mention plastic pollution, and have yet to be tested in this context in the courts.

It is possible that plastic producers and waste management companies could be vulnerable to future claims, especially as extensive plastic pollution clean-up is required. For example, where recycling companies pass materials to other countries for recycling and adequate recycling does not take place, liability claims could possibly be made. Companies providing products found to

44 Johnny Gasperi, Stephanie L. Wright, Rachid Dris, France Collard, Corinne Mandin, Mohamed Guerrouache, Valérie Langlois, Frank J. Kelly, Bruno Tassin (2018). Microplastics in air: Are we breathing it in? *Current Opinion in Environmental Science & Health*, Volume 1, Pages 1-5. Available at: <https://www.sciencedirect.com/science/article/pii/S2468584417300119?via%3Dihub>

45 Helen Lynn, Sabine Rech and Margriet Samwel (2016). *Plastics, Gender and the Environment*. Available at: <http://www.wecf.eu/download/2017/11-November/GenderPlasticsLiteratureReview22Sept16.pdf>

46 Maria Arias-Andres, Uli Klümper, Keilor Rojas-Jimenez and Hans-Peter Grossart (2018). Microplastic pollution increases gene exchange in aquatic ecosystems. *Environmental Pollution*, Volume 237, 2018, Pages 253-261. Available at: <https://www.sciencedirect.com/science/article/pii/S0269749117349990?via%3Dihub>

47 <https://www.beatthemicrobead.org>



contain microplastics may also be vulnerable. For example, recent research showed that bottled water—a product promoted for its purity—contained levels of plastic fibres twice as high as those found in tap water.⁴⁸ A further risk is that plastic producers face liability claims for bodily damage caused by chemicals in plastic products (see the box below).

Bodily harm risks associated with chemicals in plastics

Some of the chemicals used in plastics have been linked with bodily harm and it is possible that those who come into contact with these plastics (either as a result of intentional contact or through exposure to plastic pollution), could bring liability cases against the plastic producers or those that distribute plastics.

According to the analysis of Praedicat, a firm that employs algorithms to scan over 30 million scientific journal articles to identify new risks for insurers and others, there exists “a 1% probability that three chemical agents—phthalates, BPA, and formaldehyde—could be involved in multibillion-dollar health-related future losses... in the range of USD 140 billion from phthalates, USD 65 billion from BPA, and USD 110 billion from formaldehyde.”⁴⁹ Two of those chemicals (phthalates and BPA) are used in plastics production. Phthalates are added to plastics to make them more flexible and BPA is used to produce polycarbonate plastic, a clear and nearly shatter-proof plastic used in many common objects from baby bottles to consumer electronics.

Both phthalates and BPA have been linked by scientists to human diseases including cancers, reproductive injuries, cognitive disorders and heart disease, among many others. The consequences of phthalates on male reproduction are better understood than its effects on female reproduction, which is worrying given women’s high levels of exposure to the chemicals through personal care and cosmetics. Nonetheless, phthalates have already been linked with infertility and premature ovarian failure.⁵⁰

Of all the 4,500 possible bodily harm risks which Praedicat is tracking, phthalates represent the single largest potential products liability risk because of how ubiquitous plastics containing the chemical are and because of the range of harms associated with the chemical.⁵¹

Where these chemicals are present in objects produced for consumers, insurers would not necessarily avoid liability claims for harm caused by these chemicals through pollution exclusions, since harm is not caused by a discarded by-product but by the produced object itself. For now, mass litigation has not come about because of the difficulties in linking specific bodily harms with exposure to specific chemicals. However, scientific investigation on these chemicals is developing, and it may soon be possible to link specific chemicals in common plastic objects to specific bodily harm. If so, this could lead to mass litigation. Although many insurers have not yet reflected this risk in their liability pricing, some insurers are well aware of the risks, and some are even developing covers for liability claims related to these chemicals as named perils.

Although very few insurers have yet reflected these risks in their liability pricing, some insurers are well aware of them and are developing various approaches to manage these risks.

Fast fact:

Of all the 4,500 possible bodily harm risks which Praedicat is tracking, phthalates represent the single largest potential products liability risk.

48 Sherri A. Mason, Victoria Welch, Joseph Neratko (2018). Synthetic Polymer Contamination in Bottled Water. State University of New York at Fredonia, Department of Geology & Environmental Sciences. Available at: <https://orbmedia.org/sites/default/files/FinalBottledWaterReport.pdf>

49 S&P Global Ratings (2019). The Unpredictable Cost Of Latent Catastrophes. Available at: <https://www.spglobal.com/ratings/en/research/articles/190603-the-unpredictable-cost-of-latent-catastrophes-10938201>

50 Patrick R. Hannon and Jodi A. Flaws (2015). “The Effects of Phthalates on the Ovary” in *Frontiers in endocrinology*, 6, 8. Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC4313599

51 Interview with Praedicat, 16th October 2019

Fast fact:

Women exposed to plastic fumes in factories have been found to have a 400% increased risk of breast cancer.

Although new research is constantly revealing new risks related to plastic pollution, its damaging impacts, especially on the ocean, has been well established for decades. As public awareness and political and regulatory environments evolve, liability cases made by individuals, groups, employees, shareholders, and even regulators may be increasingly likely to succeed. We may see similar patterns to those seen in important past liability cases such as asbestos and smoking, where risks were not originally recognised and later resulted in very high losses for companies and their insurers. If a class-action suit based on microplastic pollution succeeds, it is likely that this situation and insurers' responses will develop rapidly.

Most insurers would consider plastic pollution to be excluded from most general liability products because these products generally have a clause which excludes pollution. However, these exclusions do not generally specifically mention plastic pollution, and have yet to be tested in this context in the courts.

Employers' liability insurance

Employees in plastic production may be exposed to damaging plastic additives, which have been shown to pose a threat to human health, including reproduction, neurodevelopment and metabolism (see the box above). Plastic producers and their insurers may therefore find themselves exposed to employers' liability claims from bodily harm caused to employees working in plastic production.

Women form an important part of the work force in plastic production. In Canada, for example, the plastics industry has more women workers than in any other manufacturing sector and in some areas of the country, women make up the majority of the workforce.⁵² The chemicals involved in plastic production have been found to have particularly worrying risks for women, including the risks of cancer and reproductive problems. Such risks also apply to women exposed to plastic fumes in other factories where plastic is used, such as in automotive production. For example, women exposed to plastic fumes in factories have been found to have a 400% increased risk of breast cancer.⁵³

Pollution liability insurance

Plastic pollution could be considered under pollution liability coverage, though the vast majority of products would not have been written with plastic pollution in mind and it is unlikely to be a named peril. Nonetheless, it could be argued that plastic pollution, especially microplastic pollution, could be considered under some existing categories of pollution such as "releases".

So far, we have not seen examples of insurers specifically writing products to explicitly cover plastic or microplastic pollution. If this becomes a source of future liability cases, plastic pollution may be excluded explicitly from many liability products. However, some insurers may develop specific products with this as a named peril and this could represent an opportunity for innovative insurers. It would be important to collect extensive data on plastic and microplastic pollution and its effects over time to better develop such coverage.

Directors' and officers' (D&O) liability insurance

D&O policies seeks to insure company management against personal liability claims which can be taken out against them by shareholders for a perceived breach of duty. It is possible that allowing a company to continue high rates of plastic pollution, or selling products that are highly polluted with microplastics despite increasing research on the dangers, could be considered a breach of duty. However, insurance companies are increasingly excluding pollution in this kind of insurance policy.⁵⁴

52 The National Network on Environments and Women's Health and the Canadian Women's Health Network. Available at: <https://www.healthandenvironment.org/uploads/docs/Womenandplastics.pdf> (Accessed 15/11/2019)

53 J.T. Brophy, M.M. Keith, A. Watterson et al. (2012). Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: a Canadian case-control study. *Environ Health* 11, 87. Available at: <https://rdcu.be/bWVlP>

54 John G. Nevius; Kathleen F. Donovan; Rachel Seebacher (2012). "Business Decisions and Pollution Exclusions: A Toxic Mix for Corporate Directors and Officers" in *Environmental Claims Law Journal* 24, no. 1



It could also be possible for the reputation and transition risks around plastic to create D&O liability claims, should company directors make strategic errors in not recognising changing consumer attitudes to plastics and demand for a product or services be severely damaged as a result.

3.7 Life

With the health risks related to plastic pollution described in section 3.5, plastic and microplastic pollution could impact on mortality rates and therefore on life insurers. Some life insurers have shared with the PSI that plastic pollution is a risk that they are monitoring for its potential effects on human health and mortality. However, with current evidence on the extent of damage inconclusive, they have not generally made any underwriting assumptions on its impact on health and mortality rates.

It is important for insurers and reinsurers to carefully monitor developing evidence on the health impacts of microplastics so that these can be factored into their models. Furthermore, it is in life insurers' interests to support campaigns to more carefully regulate plastics and microplastics to ensure that human lives are not impacted.

3.8 Marine

Marine underwriters are already experiencing the impact of plastic pollution. Plastic marine litter causes damage to vessels and to fishing gear, resulting in increased insurance claims. One survey respondent explained that their company was paying out hundreds of thousands of dollars in marine hull claims because of abandoned plastic fishing lines becoming entangled in bow thruster seals.

Furthermore, the productivity of fishing is damaged by reduced catches as a result of ghost fishing (fishing gear abandoned, lost or otherwise discarded at sea that continues to fish and trap animals), catches filled with waste, and the time lost by diversions taken to avoid marine litter encounters. Furthermore, fish supplies can be put at risk by plastic pollution. Fish can become entangled in plastic debris and their environments are changed as plastic debris also allows marine organisms to move beyond their natural range, leading to invasive species arriving in new areas and possibly causing damage. Once caught, fish are increasingly found to be polluted with microplastics and this could in the future lead to indemnity issues should levels of plastics in seafood be found to have impacts on human health. Finally, fisheries may also struggle as consumer demand for seafood is impacted by increasing evidence of plastic contamination. This may in turn impact insurers underwriting these businesses.

The fishing sector has a high plastic footprint, and insurers have the opportunity to engage with fishery businesses on reducing their plastic footprint. They can raise awareness of the importance of ensuring that no plastic waste, such as nylon nets, is left at sea, in order to reduce risks to the fishery sector. In particular, marine insurers should take measures to verify that they are not insuring illegal, unreported or unregulated (IUU) fishing vessels. IUU vessels are more likely to be linked to loss of fishing gear at sea, which represents a particularly damaging form of marine plastic pollution. Therefore, by tackling IUU fishing, insurers are also addressing plastic pollution. The PSI and Oceana have released guidelines to support insurers in doing so.⁵⁵

Fast fact:

Illegal, unreported or unregulated (IUU) fishing vessels are more likely to be linked to loss of fishing gear at sea—a particularly damaging form of marine plastic pollution.

55 United Nations Environment Programme's Principles for Sustainable Insurance and Oceana (2018). Risk assessment and control of IUU fishing for the marine insurance industry. Available at: <https://www.unepfi.org/psi/wp-content/uploads/2019/02/PSI-Oceana-IUU-fishing-guidelines.pdf>

Finally, spills of cargo can collide with vessels, causing them damage. Such spills also pose a high risk to marine environments and are likely to contaminate both the surrounding ocean and coastlines. This could result in liability claims for marine cargo insurers, particularly given that many branded plastic products are easily recognisable when they wash up in large quantities on surrounding beaches. In 2016, for example, thousands of Hewlett Packard printer ink cartridges were found washed up on beaches along the UK's south and west coasts, as well as the Irish Republic, France, Portugal, the Azores, and the Hebrides. Beachcombing groups and individuals on social media started to notice a pattern and Hewlett Packard confirmed that the cartridges were lost at sea due to a spill during an Atlantic storm. The company made a donation to support beach clean-up efforts.⁵⁶ In the future, companies may find themselves compelled to pay for such clean-ups. Insurers can engage with shipping companies to raise awareness of the damage that can be caused by plastics in the ocean and to prevent spillage where possible. In addition, insurers can support efforts for adequate collection systems and incentive schemes to ensure the safe disposal and recycling of damaged property.

Fast fact:

The auto sector has been recognised as one with high potential for uptake of recycled plastic.

3.9 Motor

Motor insurance is one class of insurance which has particular potential for reducing plastic pollution. Auto insurers often provide incentive programmes for auto repairs conducted under their insurance. Some insurers commented that they already offer incentives for providers that are able to repair and reuse plastic parts, like bumpers and fenders, rather than replacing them. Such incentives play a positive role in reducing unnecessary waste in plastic car parts.

The auto sector has also been recognised as one with high potential for uptake of recycled plastic. Other plastic uses, like packaging, tend to require plastics that are customised for specific aesthetic requirements. Internal car parts do not have such specific requirements and could be more easily produced using recycled plastics. Auto insurers could therefore consider extending their existing incentive schemes to also encourage auto repairers to use recycled plastic parts where it is not possible to reuse existing parts, as well as to sort old plastic parts for recycling.

3.10 Property

Plastic pollution contributes to environmental problems that can have direct results on some property claims. For example, urban plastic pollution is clogging drains and already contributing to floods in India⁵⁷ and in Bangladesh, where, following the 1998 flood, research conducted by the Environment and Social Development Organization (ESDO) found that up to 80% of the city's water-logging was caused by polyethylene blocking drains.⁵⁸

On the other hand, property insurance is a business line in which insurers have the potential to contribute to reduced plastic use and better waste management and recycling. Due to the fact that plastic is a flammable material, property insurers often carry out checks on the plastic used as one factor relevant to pricing a risk. This existing check on plastic could be leveraged to check that plastic also meets quality standards for subsequent recycling. In addition, insurers can support efforts for adequate collection systems and incentive schemes to ensure the safe disposal and recycling of damaged property.

56 Mario Cacciottolo. 2016. HP cartridges wash up around UK and Europe after spill. (BBC News) Available at: <https://www.bbc.com/news/uk-35254931>

57 Kanchan Chaudhari (2018). Only blanket plastic ban can prevent choking of rivers: Maharashtra to Bombay HC. Available at: <https://www.hindustantimes.com/mumbai-news/only-blanket-plastic-ban-can-prevent-choking-of-rivers-maharashtra-to-bombay-hc/story-D6Uo1ySvL2eb6jyYn0FLCL.html>

58 Environment and Social Development Organization. Ban plastic bags. Available at: <https://esdo.org/our-success/plastic-bag-free/>



For some types of property cover, insurers have an important role in reinstating damaged property. In this case, insurers have an opportunity to work with loss adjusters to ensure that property is replaced or repaired in a way that minimises use of new plastic and encourages the use of recyclable and recycled plastics. Indeed, EU research found that construction, furniture and electronics sectors are an important source of plastics waste that could be recycled, as well as sectors within which certain applications have particular potential for using recycled plastic (such as insulation materials, pipes, outdoor furniture or dashboards).⁵⁹

3.11 Pet insurance

Plastic pollution poses risks for pets in two ways. Firstly, pieces of plastic litter on the streets and in environments in which pets live can be consumed by them and pose risks from choking to causing internal damage. Dogs, in particular, are frequently walked in public areas like beaches, parks and streets where plastic pollution is particularly common. Secondly, microplastics are present in the water and food consumed by pets, just as they are in those consumed by people, and this contamination poses many of the same risks to pets as it does to human health and life. In particular, additives in plastics are known to disrupt animals' hormonal systems and nanoparticles have been shown to cause inflammation and to traverse cellular barriers.⁶⁰ Microplastics tend to accumulate as they move up the food chain, so larger animals that consume meat, like cats and dogs, are likely to have higher quantities of plastics in their bodies.

The health risks of plastic litter and microplastics for animals could impact on veterinary treatment claims for pet insurers. As the health risks posed by plastic pollution to animals become increasingly clear, pet insurers may consider raising awareness of these risks among their customers. They might also consider sponsoring activities like beach clean ups that make these spaces safer for pets.

3.12 Other specialised insurance lines

Product recall insurance

New discoveries are constantly being made about the dangers associated with particular plastic types. For example, oxo-degradable plastics were initially considered to be more environmentally friendly than conventional plastics, but the EU is now planning to restrict them because of new research showing that their rapid fragmentation is in fact damaging and does not offer any environmental advantages.⁶¹

There is therefore a risk that, as legislation around plastic types tighten and we learn more about their specific risks, companies may be forced to recall items that make use of certain plastic types found to be particularly damaging for the environment or human health. This could result in claims for product recall insurance.

On the other hand, insurers offering product recall insurance have the opportunity to work together with their clients to manage plastic risks and avoid plastic types known to be more risky and harder to manage and recycle.

59 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

60 United Nations Environment Programme (2018). Plastic planet: How tiny plastic particles are polluting our soil. Available at: <http://www.unenvironment.org/news-and-stories/story/plastic-planet-how-tiny-plastic-particles-are-polluting-our-soil>

61 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

Business interruption insurance

Plastic pollution can result in significant loss of income for tourism businesses. For example, in December 2017, Bali had to temporarily close some of its most popular tourist beaches due to an influx of (mostly plastic) waste on its coastline.⁶² Tourist sites, hotels, tour companies and water-based sports companies all experience reduced incomes when plastic pollution deter visitors. This has a direct impact on workers at these companies, as well as other formal and informal workers who are connected to the tourism industry in the area. Women are highly represented in the tourism industry, making up 60-70% of the labour force in the hotel sector. Although women continue to be under-represented in more lucrative and managerial roles in tourism, evidence suggests that it is an industry in which they have greater opportunities to advance professionally in comparison to other industries.⁶³ Women are more likely to own their own businesses in the sector. Over half of businesses in Indonesia, Malaysia, the Philippines, and Thailand, are run by women, and more than 70% of businesses are run by women in Nicaragua and Panama (compared to an average of 20% in other sectors).⁶⁴ Women workers and women-run businesses are therefore particularly vulnerable to any events, like surges in plastic pollution, which deter visitors.

In many cases, plastic pollution does not come primarily from tourist activities, although this is also an issue. Rather, plastic pollution can be carried vast distances at sea and activities in one country can affect beaches in another. Insurers could therefore consider offering business interruption insurance to cover surges in coastal plastic pollution. In addition to covering lost income, these products could fund activities like beach clean-ups to combat surges in plastic pollution when they occur.

62 Luke Hunt (2018). Bali's garbage emergency exposes Indonesia's big rubbish problem. Available at: <https://thediplomat.com/2018/01/balis-garbage-emergency-exposes-indonesias-big-rubbish-problem/>

63 The World Bank Group (2017). Women and Tourism: Designing for Inclusion. Available at: <http://documents.worldbank.org/curated/en/401321508245393514/pdf/120477-WP-PUBLIC-Weds-oct-18-9am-ADD-SERIES-36p-IFCWomenandTourismfinal.pdf>

64 World Tourism Organization and UN Women (2010). Global Report on Women in Tourism. Available at: http://www2.unwto.org/sites/all/files/pdf/foleto_global_report.pdf



4. How plastic pollution risks play out across asset classes

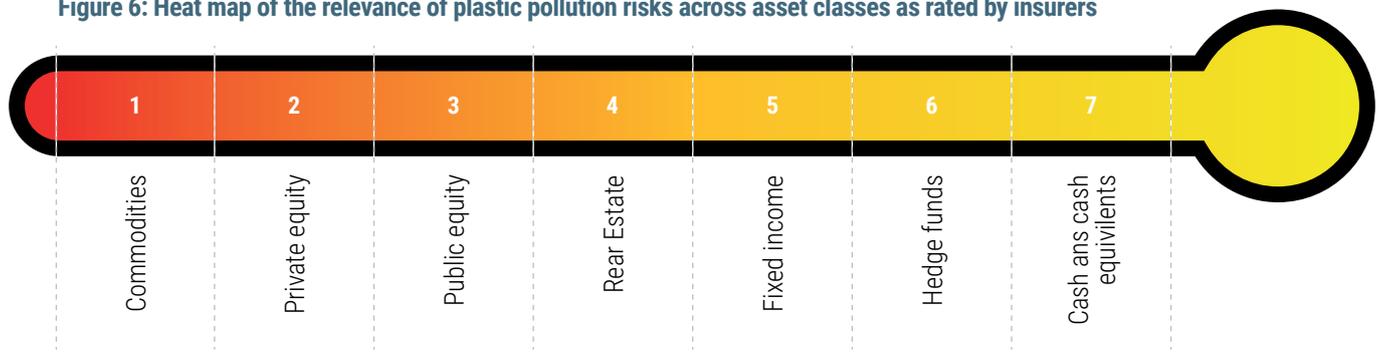


Insurance companies' investments are generally long-term. Where investments are made in companies, care is taken to choose companies that are considered to be viable over a relatively long timeframe. The risks posed by plastic pollution, especially those around transition risks, are likely to materialise within such a timeframe and may affect the value of these investments. Plastic pollution risks are therefore particularly important for insurers' investments and insurers should seriously consider the exposure of their investment portfolio to risks associated with plastic pollution.

Research has shown that good environmental performance has a wealth protection effect.⁶⁵ Therefore, investments in environmentally responsible companies with a responsible approach to plastic production, use and disposal, should contribute to securing a less volatile and better performing investment portfolio over time.

Risks associated with plastic pollution play out across all asset classes. Insurers were asked to rate asset classes according to the importance of plastic pollution risks to that class. Insurers rated them in the order shown in the heat map below (Figure 6), with the first being the most relevant to plastic pollution risks and the last being the least relevant.

Figure 6: Heat map of the relevance of plastic pollution risks across asset classes as rated by insurers



Source: PSI global survey on insurers' attitudes to and actions to address plastic pollution risks

4.1 Cash and cash equivalents

This study has not found direct links between plastic pollution risks and cash and cash equivalent investments.

4.2 Commodities

Tradable commodities fall under four main categories: metals, energy, livestock and meat, and agricultural. Plastic pollution has little direct connection with metal commodities. However, there is some possibility that demand for metals could be affected by efforts to use alternatives to plastics, particularly in packaging, which could include increased use of metals.

Plastic pollution has an important connection with energy commodities. Plastics are made from petrochemicals, which come from oil and natural gas feedstocks. The same companies driving the fossil fuel industry are also manufacturing plastic, such as DowDuPont, ExxonMobil, Shell, Chevron, BP and Sinopec. While oil demand is expected to slow as a result of the rise in electric vehicles, more energy efficient engines and renewable energy, demand for petrochemicals for plastic manufacturing is expected to grow if current rates of plastic use continue. The International Energy Agency has estimated that petrochemicals will account for over a third of the growth in oil demand to 2030, and nearly half to 2050.⁶⁶ That could of course change if governments take a proactive approach to taxing and banning certain plastics. Although increasing plastic demand

65 N. Muhammad, F. Scrimgeour, R. Krishna and A. Sazali (2014). The impact of corporate environmental performance on market risk: The Australian industry case. Journal of Business Ethics. Available at: https://www.researchgate.net/publication/264558059_The_Impact_of_Corporate_Environmental_Performance_on_Market_Risk_The_Australian_Industry_Case

66 International Energy Agency (2018). The Future of Petrochemicals. Available at: <https://www.iea.org/petrochemicals/>



may make oil commodities seem more attractive, insurers should be wary that current use of plastic is ultimately unsustainable. These activities face significant transition risks, not to mention the reputation risks associated with public rejection of both fossil fuels and plastic pollution, which will ultimately impact on related energy commodities. This issue is discussed in more detail on the box below on plastic as a stranded asset.

Plastic pollution is also relevant to livestock and meat commodities and to agricultural commodities. As explained in section 3.1, microplastics and plastic litter may pose risks to agricultural land and to livestock. Eventually, these risks may also be found to be damaging for humans consuming agricultural and meat produce, creating difficulties for these sectors.

4.3 Fixed income

Fixed income investments pay investors fixed interest payments until the agreed maturity date is reached. The most common types are government and corporate bonds, although many types of fixed income investments exist. In addition to government bonds, bonds are also issued by other levels of government authorities, such as state or municipal bonds. Given the high risks posed by plastic pollution to municipalities, cities and governments, plastic pollution is a very relevant risk for insurers to consider and engage with for this asset class.

Government, municipal and state bonds are used to finance capital expenditure, such as creating, upgrading and maintaining infrastructure and property. Where insurers invest in government, state or municipal bonds, they may be able to exert some influence on how those funds are used. For example, if a municipal bond is used to finance water infrastructure, an insurer who invests in that bond can engage with the municipality on its plastic waste management, recognising that this is an important risk relevant to the bond. There is more detail on engaging with cities and municipalities in section 5.9 of this study.

Corporate bonds are often raised for specific purposes, such as to build a new factory. Where bonds are issued for activities directly related to plastic production or waste management, insurers should consider engaging with the company before purchasing the bond to find out about its efforts around producing more recyclable plastics or managing waste in a way that limits pollution. For example, if an insurer were to be considering purchasing bonds for a new bottling plant, they could engage with the company on the type of plastic that will be used and how that type of plastic bottle can be recycled in the country in question.

The green bonds market is rapidly growing, offering investors, including insurers, the opportunity to select bonds that contribute to addressing climate change. To date, these bonds largely address plastic pollution only indirectly. For example, the Climate Bonds Standard and Certification Scheme identifies green bonds that are consistent with the global warming limit in the Paris Agreement. Plastic production, recycling and incineration are carbon-intensive, meaning that bonds that track carbon emissions will somewhat account for plastics. The first bonds to explicitly consider the issue of plastic pollution are appearing. For example, in 2019, the World Bank released a Sustainable Development Bond to draw attention to the challenge of plastic waste pollution in the ocean.⁶⁷ The first green city bonds to improve the management of waste, including plastic waste, are also being issued (see section 5.9 of this study for more information and examples). Insurers can seek out green bonds that contribute to reducing plastic pollution as part of their investment strategy.

67 The World Bank (2019). World Bank Launched Bonds to Highlight the Challenge of Plastic Waste in Oceans. Available at: <https://www.worldbank.org/en/news/press-release/2019/04/03/world-bank-launches-bonds-to-highlight-the-challenge-of-plastic-waste-in-oceans>

4.4 Hedge funds

Hedge funds make varied investments, including land, real estate, stocks, derivatives, currencies and so on. Therefore, in many ways, all the risks described under each asset class in this section can also apply to hedge funds. One key additional consideration is that many hedge fund managers sit on corporate boards and are involved in corporate governance, so they have considerable potential influence on the ESG practices of the companies in which they invest. Hedge funds are only accessible to accredited investors and require large initial investments in order to take part. This means that they generally have fewer investors than are typically seen in other asset classes. Insurers may therefore be able to wield greater influence in persuading hedge funds to consider ESG criteria such as plastic footprint.

Some hedge funds, known as “green hedge funds”, are taking a more sustainable approach and integrating ESG factors into their management. Where insurance companies invest in such funds, they should engage the fund managers on plastics and ask to see that plastic pollution is reflected in the ESG guidelines used by the fund.

4.5 Private equity

Plastic pollution risks, particularly liability, reputation and transition risks, could have an important impact on the profitability of private firms that are high plastic polluters. For example, as legislation around plastic tightens and the costs of plastic waste management and pollution are transferred to companies that produce and use plastic, such companies could see their profits suffer and some may even find their business models thrown into doubt. When investing specifically in plastic manufacturers and businesses highly dependent on plastic, insurers should consider the possibility that these businesses may devalue rapidly as the unsustainability of single-use plastic is increasingly recognised, producers are forced to take on the costs related to the damage it causes, and competition from new technologies and plastic alternatives grows.

The United Nations-backed Principles for Responsible Investment (PRI) point out that private equity has a long-term investment horizon and, at its best, is considered a stewardship-based investment, meaning that ESG considerations should be a natural fit.⁶⁸ However, the fact that private equity is not traded publicly means that private firms are not generally exposed to the same levels of shareholder pressure experienced by publicly listed companies. Private equity investors certainly can have an influence on companies’ decisions, especially given the usually smaller and more homogenous group of investors in a private firm.

The PRI recommends that a policy statement or similar should be produced by an investor outlining their approach to responsible investment, the ESG issues it covers and its priorities, and its expectations of its investees. Plastic pollution can be considered as one factor in such a policy. On this basis, insurers can identify their private equity investments in high plastic polluters and engage with those companies to measure and set targets to reduce their plastic footprint and to prepare for transitions towards a circular economy.

4.6 Public equity

In the same way described above for private equity investments, plastic pollution risks, particularly liability, reputation and transition risks, could have an important impact on the profitability of firms that are high plastic polluters. Insurers should therefore take care to identify where their public equity investments are particularly exposed to high plastic polluters and to engage with companies and funds to measure and gradually lower companies’ plastic footprints.

68 Principles for Responsible Investment (2011). Responsible investment in private equity. Available at: <https://www.unpri.org/download?ac=260>



Publicly listed companies are often exposed to significant pressure from their shareholders, especially from their largest investors. Insurers are large investors and may be able to exert significant influence over boards and to persuade companies to consider ESG issues, including plastic pollution. The PRI encourages public equity investors to act as active owners, as one of the most effective mechanisms to reduce risks, maximise returns and have a positive impact on society and the environment.⁶⁹ Plastics is certainly a topic on which an active owner approach would be powerful. The risks associated with plastic pollution are in many cases poorly understood, and insurers can do a great deal to encourage their investees to understand and appropriately respond to these risks. In particular, by asking investees to measure and disclose share their plastic footprint, insurers will have a benchmark which will allow them to develop objectives and milestones to reduce the plastic pollution risks in their public equity portfolio.

Could plastic become a stranded asset?

As the world shifts towards electric vehicles and to reduce fossil-fuel emissions, it is predicted that oil demand for road transport will peak in 2025.⁷⁰ As a result, oil and gas companies are increasingly looking to petrochemicals to save the sector. These petrochemicals are used to make plastics and oil and gas companies hope to benefit from growing levels of plastics use. It has been predicted more than half of growth in demand from oil may come from plastic production by 2050.⁷¹

However, many believe that plastics will prove only a temporary reprieve for oil and gas companies.⁷² Regulators are making moves towards making producers or companies using packaging responsible for the costs of waste management, following the “polluter pays” principle, as described in section 2.4 of this paper. At the same time, consumer awareness around plastic pollution has grown and plastic alternatives will likely become more readily available in the near future.

In fact, a recent report from WWF suggests that these factors could have a tangible impact on demand for plastics.⁷³ World demand for plastics is currently growing at around 3.5% annually and many expect this to continue in the foreseeable future, but WWF estimates that the 2018-2030 compound annual growth rate for virgin plastic demand will drop to between 1.1% and 2.5%. The report predicts that the least diversified companies with activities concentrated in virgin plastic resins will be the most affected by reduced demand, whereas plastics manufacturers who are able to take advantage of opportunities related to technological and regulatory change, especially around recycled plastics, are likely to fare better. WWF notes that it is yet unclear which companies will be able to take advantage of this changing environment. Investors should therefore monitor developments closely for investment opportunities and risks. Nonetheless, it is already possible to identify companies with particularly high exposure to virgin plastic resins, and the WWF report includes a list of such companies.

To date, the threat of increased regulation and reduced demand for plastics has not yet impacted on equity prices for companies producing plastic resins. However, it will certainly have an impact as tougher regulations are ramped up. As a result, petroleum assets valued for their potential to be converted into petrochemicals could become stranded assets in the same way as those intended for fuel.

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- 69 Valeria Piani, Kris Douma and Anna Georgieva (2018). A Practical Guide to Active Ownership in Listed Equity. Available at: <https://www.unpri.org/download?ac=4151>
- 70 J. Eddy, O. Rolser, N. Sharma, B. Smeets and C. Tryggestad (2018). Five key questions clients ask about our energy demand outlook to 2050. McKinsey and Co.
- 71 R. Bousso and A. Ghaddar (2018). Rising use of plastics to drive oil demand to 2050: IEA. Reuters.
- 72 Samuel Block (2019). The last straw: Will plastic become the next stranded asset? MCSI.
- 73 Peter Rawle (2019). Shrinking Plastics: Implications of Tighter Regulations on the World Industry. WWF-Hong Kong. Available at: https://d3q9070b7kewus.cloudfront.net/downloads/shrinking_plastics2.pdf

4.7 Real estate

High plastic pollution in a city or particular geographical area could damage certain real estate investments, for example, if flooding is regularly caused by drains clogged by plastic pollution, or if seas and shorelines become very polluted around coastal cities. It is therefore in the interests of those with real estate investments to support reduced plastic use and better waste management in the municipalities, states and cities in which they hold real estate investments.

Furthermore, UNEP FI's Property Working Group brought together academic and industry evidence to show how responsible property investment which applies ESG criteria can protect and increase financial performance throughout the lifecycle of buildings and, at the same time, reduce damaging social and environmental impacts. For example, "green real estate" has been linked with higher demand and reduced rates of depreciation, and data shows that energy certified and green real estate has a lower risk of mortgage default.⁷⁴ The group's guide for real estate investors provides plenty of guidance in integrating ESG considerations into real estate investing.

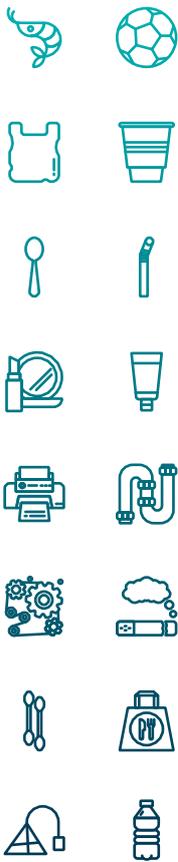
Insurers investing in real estate can include plastic pollution as one element of their ESG policy and put in place measures to engage with property managers, operators and maintenance to make sure that plastic is better managed in their real estate portfolio. At acquisition stage, insurers can consider the use of plastic in the buildings themselves.

When managing a real estate portfolio, insurers can stipulate certain practices that must be taken by property managers and other to reduce the use of single-use plastics in their buildings and to adequately manage plastic waste, including separating plastics for recycling. Changes in tenants often generate enormous waste, including large quantities of plastics, as carpets, structures, equipment and furniture are often simply discarded. Insurers could consider ways to ensure that these are reused and recycled where possible. Many insurers themselves have strong plastic initiatives within their own offices and they should encourage those renting their real estate to do the same. One powerful measure would be to measure and report on the plastic footprint of their real estate portfolio.

74 Tatiana Bosteels and Peter Sweatman (2016). Sustainable Real Estate Investment. Available at: <https://www.unepfi.org/fileadmin/documents/SustainableRealEstateInvestment.pdf>



5. How insurance companies can tackle the risks of plastic pollution



There are several possible approaches for insurers to contribute towards reducing the risks of plastic pollution. This section outlines ten ways in which insurers can approach plastic pollution, and there are undoubtedly more. We would recommend that insurers consider all possible approaches and begin by implementing those that best suit their business.

Ten approaches for the insurance industry to tackle plastic pollution

LEAD BY EXAMPLE	
1.	Introduce policies to reduce plastic use and waste internally
2.	Include plastic pollution in ESG or sustainability approaches
UNDERSTAND, PREVENT AND REDUCE PLASTIC POLLUTION RISKS	
3.	Support knowledge and build awareness among the public, government and industry
4.	Include plastic pollution risks in risk assessment models for insurance and investment activities
5.	Develop relevant risk reduction measures
6.	Reduce the plastic footprint of reinstating damaged property
INSURE RISKS ASSOCIATED WITH PLASTIC POLLUTION	
7.	Design innovative insurance products to cover the risks associated with plastic pollution
SUPPORT ALTERNATIVES TO PLASTIC	
8.	Support innovations for plastic alternatives through insurance products and investments
SUPPORT WIDER EFFORTS TO REDUCE PLASTIC POLLUTION	
9.	Actively engage with key stakeholders as risk managers, insurers and investors
10.	Disclose plastic pollution risks and opportunities in relevant disclosure and reporting frameworks

Fast fact:

Over half of insurance companies surveyed had adopted policies to reduce their plastic footprint.

5.1 Introduce policies to reduce plastic use and waste internally

Many insurers have taken concerted efforts to reduce plastic use and waste internally within their company offices. Approximately 53% of respondents in our survey stated that their companies had adopted internal policies to reduce plastic pollution in their day-to-day operations. Measures ranged from removing single-use plastics like plastic straws and cups from office catering to improving recycling. Some measures have been taken in response to national bans but, in many cases, companies have gone far beyond what is legally required. These efforts reflect considerable staff concern around plastic waste and pollution. The vast majority of survey respondents (93%) felt that staff at their companies were aware of plastic pollution risks. Around 28% said that their colleagues were concerned and taking active steps to reduce their plastic use, and 16% said that their colleagues were conscientious in reducing plastic use and raising awareness among their peers. This demonstrates considerable awareness and interest among insurers’ employees that can be leveraged for further action to reduce plastic pollution.

Insurers that do not yet have internal measures in place to reduce their own plastic use and improve recycling facilities should start there. They can lead by example by measuring and disclosing their plastic footprint and setting public targets to reduce and eventually eliminate single-use plastics from their operations. Insurers can consider joining alliances and signing up



to public pledges, such as the UK Plastics Pact⁷⁵ or the plastics pact being developed by WWF South Africa and the South African Plastics Recycling Organisation (SAPRO).⁷⁶ They should also encourage their suppliers to do the same, ideally including plastics criteria in policies used to select suppliers.

Public awareness around plastic pollution is particularly high in many countries as a result of media, celebrity and NGO campaigns. For example, the final episode of BBC's Blue Planet II series, presented by David Attenborough, presented devastating images of ocean pollution and its damage to ocean creatures that caught public attention and inspired many people to make changes to their own plastic habits. One consumer research poll suggested that 88% of people in the UK who watched the episode subsequently changed their behaviour around plastic use.⁷⁷

This groundswell in plastic awareness among insurers' employees represents a significant opportunity for engaging staff on the need to enact measures to reduce plastic pollution both through a company's internal operations and through its ESG policies (see section 5.3).



5.2 Include plastic pollution risks in ESG or sustainability approaches

Each insurance company will take its own approach to ESG risk according to its unique business model, specific lines of business, size, geographic scope, governance structure and other factors. This approach may consist of a set of policies, frameworks, guidelines or processes. The PSI global guide to manage ESG risks in non-life insurance business provides a concrete example of how insurance companies can integrate plastic pollution risks into their ESG or sustainability approaches.⁷⁸

Regardless of their approach, insurance companies should strive to include indicators related to plastic pollution in their ESG or sustainability approach. A stand-alone plastics policy is not necessarily required, and plastic pollution could be included under measures related to climate change, given the impact of plastic production and pollution in accelerating climate change, or under pollution policies. However, measures related to plastic pollution should be made explicit to allow for insurers to engage in a consistent way with high plastic polluters to encourage them to reduce their plastic footprint.

One challenge in doing so is that there is no commonly-used measure of plastic pollution among companies, so tracing and measuring companies' contribution to plastic pollution—their plastic footprint—is difficult. UNEP research conducted in 2014 found that disclosure rates of even very basic information varied considerably between sectors. Companies in the footwear and athletic goods sectors did not report any quantitative data on plastics, compared to 88% of companies in the durable household goods sector and 71% of companies in the personal products sector which provided at least one data point on their plastic use.⁷⁹ Even where some data is provided, it is often insufficient. Measuring the extent of plastic use and pollution is a vital first step in taking concrete actions to reduce it. Therefore, as a priority, insurers should measure and disclose their

75 The Waste and Resources Action Programme. The UK Plastics Pact. Available at: <http://www.wrap.org.uk/content/the-uk-plastics-pact> (Accessed 28/10/2019)

76 South African Plastics Recycling Organisation. Global Circular Plastics Commitments. Available at: <https://www.plasticrecyclingsa.co.za/developing-the-south-african-plastics-pact/> (Accessed 28/10/2019)

77 Waitrose & Partners (2019). Food and Drink Report 2018-19. Available at: https://waitrose.pressarea.com/pressrelease/details/78/NEWS_13/10259

78 United Nations Environment Programme's Principles for Sustainable Insurance (2019). Global guidance on the integration of environmental, social and governance risks into insurance underwriting. Available at: www.unepfi.org/psi/underwriting-esg-risks

79 United Nations Environment Programme (2014) Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry

own plastic footprint and call on their clients and investees to do the same.⁸⁰ This is in insurers' interest, particularly for the companies in which they invest, in order to better understand the extent to which their investments are exposed to risks related to plastics. The Plastic Disclosure Project⁸¹ is one toolkit that can be used to help companies measure their plastic footprint. This can be presented as a risk management mechanism for clients and, eventually, could be made a requirement for investees. In the meantime, the PRI has suggested that, for consumer goods companies, levels of recycled content in plastic packaging, coupled with a company's ambition for recycled plastic, could be used a potential proxy for evaluating the extent to which a company is moving towards circularity.⁸²

In addition, insurers can use reports by NGOs which identify the companies responsible for the highest levels of plastic pollution. One recent report identified the world's top ten plastic polluters: Coca-Cola, PepsiCo, Nestlé, Danone, Mondelez International, Procter & Gamble, Unilever, Perfetti van Melle, Mars Incorporated, and Colgate-Palmolive.⁸³ The top three of these alone were responsible for 14% of the branded plastic found polluting the environment across the six continents in which this research took place. Where insurers underwrite or invest in these companies, or others identified as top polluters in similar reports, they should engage with them as a priority. Insurers can consider monitoring such reports and setting up a flag in their ESG, underwriting or investment systems to review transactions related to these companies.

To more effectively engage with such companies, insurers can join existing investor campaigns, such as the Plastic Solution Investor Alliance, whose members engage with the consumer goods companies in which they invest to: "transition plastic packaging to be recyclable, reusable, or compostable to the fullest extent possible; disclose annual plastic packaging use; set plastic use reduction goals; develop alternatives to plastic for packaging purposes, especially for single-use packaging; acknowledge responsibility and play a significant role in funding and facilitating collection and recycling or composting of packaging in markets where they operate (i.e. producer responsibility); support public policy measures on reducing plastic waste and broadening producer responsibility; accelerate research on the potential for technology and innovation to provide solutions."⁸⁴

In addition, insurers should consider how plastic fits with its approaches to human rights. Plastic, and particularly plastic waste management and recycling, have been linked with human rights abuses like child labour. For example, children have been found to be working in plastic recycling factories in Bangladesh and to face health problems as a result.⁸⁵ While promoting better recycling of plastics, insurers should take care to make sure that this recycling is carried out in a responsible way and without human rights abuses.

80 Insurers can look for reference to programmes in other sectors like, for example, the "Checking out on plastics" campaign directed at retailers by Greenpeace and the Environmental Investigation Agency, which asks retailers to:

- set year-on-year targets to reduce their single-use plastic footprint
- urgently eliminate unnecessary and non-recyclable plastic packaging by the end of 2019
- introduce transparency by publishing yearly audits of single-use plastic usage.

Source: checkingoutonplastics.org

81 Plasticdisclosure.org

82 Principles for Responsible Investment (2018). How can investors help create a plastics economy that works? Event roundup. Available at: <https://www.unpri.org/environmental-issues/how-can-investors-help-create-a-plastics-economy-that-works-event-roundup/3409.article>

83 Greenpeace (2018). Branded: In Search of the World's Top Corporate Plastic Polluters. Volume 1. Available at: <https://www.breakfreefromplastic.org/globalbrandauditreport2018/>

84 As You Sow (2018). As You Sow Launches Investor Alliance to Engage Companies on Plastic Pollution. Available at: <https://www.asyousow.org/blog/2018/6/14/as-you-sow-launches-investor-alliance-to-engage-companies-on-plastic-pollution>

85 Sarah Bosely (2017). Child labourers exposed to toxic chemicals dying before 50, WHO says (The Guardian). Available at: <https://www.theguardian.com/world/2017/mar/21/plight-of-child-workers-facing-cocktail-of-toxic-chemicals-exposed-by-report-bangladesh-tanneries>



Insurers may find that, in some cases, their existing policies, such as on carbon emissions and pollution are already relevant to plastics. In particular, where insurers have a policy in place on tobacco, they are already contributing to the agenda to reduce plastic pollution. Plastic cigarette filters have no health benefit and, alongside plastic pouches used to sell smokeless tobacco, are a significant global source of plastic littering.⁸⁶ Cigarettes are largely discarded onto the ground, and cigarette butts—the vast majority of which contain plastic filters—have been found to be the largest single type of litter by count.⁸⁷ The trend towards electronic cigarettes is no solution, given that these are made from plastics. This waste litters streets and quickly makes its way into waterways and eventually the ocean. Therefore, by addressing tobacco, insurers can take an important step towards reducing plastic pollution. Insurers can join the Tobacco-Free Finance Pledge, which encourages signatories to consider the adoption of tobacco-free finance policies across lending, insurance and investment.⁸⁸

Insurers generally find it preferable to include emerging risks like plastic pollution within existing policies, such as ESG, climate change, underwriting or investment policies. Nonetheless, as the issue comes increasingly to the fore, insurers may eventually decide to put together a stand-alone plastics policy. This could combine their internal efforts to reduce their plastic footprint with underwriting and investment policies. No insurers interviewed for this study yet had a comprehensive stand-alone plastics policy. However, as the topic attracts increasing public attention, this would represent a clear way for insurers to communicate their commitment to addressing the problem, and to measure and report on progress.

Eventually, given the increasingly visible damage caused by public pollution, insurers may choose to stop investments altogether in the highest plastic polluters that do not take meaningful steps to reduce their plastic footprint. This would reflect similar commitments already made by insurers in sectors whose damage has been in the public eye for longer, such as the decision taken by many insurers to divest from coal, particularly companies with no clear and effective low-carbon transition strategy.

5.3 Support knowledge and build awareness among the public, government and industry

Plastic pollution presents profound risks to global businesses, economies, societies and the environment. Insurers can contribute their expertise in measuring, quantifying and modelling risks, to help improve understanding and raise awareness of risks associated with plastic pollution. This knowledge should be communicated with stakeholders, clients, investees and staff to support global efforts to tackle plastic pollution.

Many insurers have already taken action to do so, particularly in publishing public blogs and articles on the issue of plastic pollution. Insurers have the expertise and clout to influence public discussions on important risks. They should make sure that the public, government and industry do not overlook risks associated with plastic and microplastic pollution.

5.4 Include plastic pollution risks in risk assessment models for insurance and investment activities

The insurance industry is home to the world's experts in understanding and modelling risk. Over the decades, the insurance industry has developed risk assessment models to better understand and reduce risks related to natural catastrophes, pandemics, terrorism and other major risks. Climate change and cyber risks are now stimulating innovations and the development of

Fast fact:

Cigarette butts—the vast majority of which contain plastic filters—have been found to be the largest single type of litter by count.

86 World Health Organization (2017). Tobacco and its environmental impact: an overview. Available at: <https://apps.who.int/iris/bitstream/handle/10665/255574/9789241512497-eng.pdf;jsessionid=3E621A7F05DA1BF-8DE14261B5449DE0E?sequence=1>

87 T. E. Novotny, E. Slaughter (2014). Tobacco product waste: an environmental approach to reduce tobacco consumption. *Current Environmental Health Reports*. 2014;1(3):208–216. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4129234/>

88 United Nations Environment Programme Finance Initiative (2018). Tobacco-free finance. Available at: <https://www.unepfi.org/psi/tobacco-free-finance/>

enhanced or new risk models. Currently, the majority of risk modelling companies contacted for this study had not yet included risks related to plastic pollution in their models. Plastic pollution risks therefore present a new challenge and opportunity for risk modelling companies, insurers, reinsurers and brokers to enhance or develop new risk models. In this way, they also support global efforts to tackle plastic pollution by providing ways for its potential impacts to be measured and therefore better understood.

5.5 Develop relevant risk reduction measures

The insurance industry has an important role to play in directly reducing plastic pollution risks through its risk management services and insurance products. It can advise corporate clients on how to limit the impacts of plastic pollution on their operations. Advice might cover topics like preventing the accumulation of plastic litter, which is a flood risk, or recommending alternatives to plastics in construction and household items, both to reduce environmental impact and the fire risk associated with certain plastic types.

Insurers can also advise individual customers on limiting their exposure to the health risks associated with microplastics. Insurers are accustomed to engaging with customers to reduce health risks around smoking, for example, and to promote preventative health measures, including health check-ups, healthy eating and exercise. In the same way, they can engage with customers on how to avoid microplastics. As more and more day-to-day items are found to contain high quantities of microplastics, such as the recent finding of high microplastics leaked from premium tea bags,⁸⁹ insurers could provide consumers with alerts on the latest research findings and recommendations. Insurers can also direct customers to tools and applications like *Beat the Microbead*.

5.6 Reduce the plastic footprint of reinstating damaged property

One area under insurers' control is the way in which damaged property is reinstated. In many lines of business, particularly property and motor insurance, insurers reinstate or repair property when it is damaged or stolen. They already work with loss adjusters and other partners to ensure that this is done in a cost-efficient way and meets quality standards. Insurers could also introduce requirements that providers reinstate property in a way that minimises plastic use and encourages the use of more easily recyclable and recycled plastics. They should also require that any plastic waste from damaged property is dealt with responsibly and recycled where possible.

Many auto insurers have already put such measures in place, offering incentives for auto repair providers that are able to repair and reuse plastic parts, like bumpers and fenders, rather than replacing them.

5.7 Design innovative insurance products to cover the risks associated with plastic pollution

During the interviews and survey conducted for this paper, we did not come across specific insurance policies designed to cover the risks associated with plastic pollution, although there was some interest among major insurers in developing innovative products to do so. The report has already mentioned the possibility of insurers developing pollution liability insurance with plastic or microplastic pollution as a named peril.

Another possibility might be for insurers to offer products to support cities in managing plastic pollution when it reaches certain levels. This would be especially relevant for coastal cities, where levels of plastic pollution on the coast can peak because of pollution caused outside of the local authority's control. Insurers are already piloting parametric insurance policies based on factors like

89 BBC News (2019). Microplastics: Premium teabags leak billions of particles – study. Available at: <https://www.bbc.com/news/world-us-canada-49845940>



air pollution,⁹⁰ and similar approaches could be considered for plastic pollution. Such cover could be used to fund both clean-up efforts and measures to deal with the impacts of plastic pollution.

The loss of income experienced by the tourism industry as a result in surges of coastal plastic pollution was mentioned earlier in this paper, and this may be another opportunity for innovative products. As mentioned previously, in December 2017, Bali had to temporarily close some of its most popular tourist beaches due to an influx of (mostly plastic) waste on its coastline.⁹¹ Tourist sites, hotels, tour companies and water-based sports companies all experience reduced incomes when plastic pollution deter visitors.

In many cases, this plastic pollution does not come primarily from tourist activities, although this is also an issue. Rather, marine litter can be carried vast distances at sea and activities in one country can affect beaches in another. Insurers could therefore consider offering business interruption insurance to cover surges in coastal plastic pollution. In addition to covering lost income, these products could fund activities like beach clean-ups to combat surges in plastic pollution when they occur.

Many other possibilities for innovative insurance cover related to plastic pollution will likely emerge in the future.

5.8 Support innovations for plastic alternatives through insurance products and investments

Investing in and developing insurance cover for innovations and alternatives to plastic represents a key opportunity for the insurance industry. One innovation may be plastics made from biodegradable polymers, where it can be ensured that such materials biodegrade in the marine environment and do not have any negative environmental impacts. Other possibilities include bio-based alternatives to plastics and innovative models that reduce the need for plastic at all, such as take-away food systems that make use of reusable containers. Given the current levels of plastic use, new technologies, models and materials to replace its use have the potential to also be widespread. They could also be very profitable. It has been estimated that shifting to a circular model in fast-moving consumer goods could generate a USD 706 billion economic opportunity, of which a significant proportion is attributable to packaging.⁹² Furthermore, governments and others are engaging in promoting this market. The EU, for example, is promoting the recycled and innovative plastics market and the European Commission is looking into economic incentives to reward the most sustainable plastic design choices.⁹³

This will create new risks for insurers to cover and new opportunities for investment. Insurers can work with innovative companies to analyse the risks associated with their new products, services and business models and develop insurance cover to meet their needs.

They can also consider allocating part of their investments to such companies or to funds which support such innovations. Many insurance companies commit a proportion of their investments to funds focused on sustainability. Funds dedicated to ocean health as well as to the circular economy, many of which have an explicit approach to plastic pollution, have already been developed. These represent opportunities for insurers to invest in a more sustainable future and to get ahead of the transition risks as the world shifts away from plastic. In addition, given the high public profile of plastic pollution, particularly in the ocean, investment in such funds is a powerful way to communicate an insurer's commitment to sustainability.

Fast fact:

It has been estimated that shifting to a circular model in fast-moving consumer goods could generate a USD 706 billion economic opportunity.

90 Swiss Re, for example, is offering insurance against haze outbreaks in Singapore. More information is available at: <https://corporatesolutions.swissre.com/innovative-risk-solutions/non-physical-damage-business-interruption/hazeshield.html>

91 Luke Hunt (2018). Bali's garbage emergency exposes Indonesia's big rubbish problem. Available at: <https://thediplomat.com/2018/01/balis-garbage-emergency-exposes-indonesias-big-rubbish-problem/>

92 Ellen MacArthur Foundation (2013). Towards the Circular Economy 2: Opportunities of the Consumer Goods Sector. Available at: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/TCE_Report-2013.pdf

93 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

Aviva: Plastic-conscious investment

Aviva is taking active steps both to engage with companies in its investment portfolio to reduce plastic pollution, and to support innovative alternatives to plastic. It is a member of the Plastic Solution Investor Alliance,⁹⁴ an international coalition of investors engaging with publicly traded consumer goods companies on the threat posed by plastic waste and pollution. To date, Aviva has engaged with Unilever and Nestle on plastics, and supported engagement with Starbucks, Procter & Gamble and PepsiCo. Furthermore, Aviva is engaging on the topic through its flagship socially responsible investment fund (SRI fund)—the Stewardship Fund. This year, plastics was one of three of the fund's priority engagement issues, along with climate change and board diversity. Through this fund, Aviva is working with Estee Lauder, Shiseido, Tesco and others to encourage better reporting on plastic use and to introduce targets to reduce virgin plastic use.

Finally, Aviva is actively investing in plastic alternatives. Although many innovative companies offering alternatives are too small for Aviva's investing guidelines, it has found suitable companies to invest in. For example, the company invests in DS Smith, which provides packaging for consumer, retail, transit and industrial use, and is currently Europe's largest cardboard and paper recycler. In particular, the company has developed a new process of recycling soiled coffee cups and has built capacity to enable recycling of the UK's entire coffee cup waste.

5.9 Actively engage with key stakeholders as risk managers, insurers and investors

Engage with plastic manufacturers

Where insurers interact with plastic manufacturers, either by underwriting or investing in them, they can engage with them on plastic pollution risks. In particular, insurers can engage with manufacturers on the actions they are taking to make the plastic they produce more straightforward to recycle by, for example, producing plastics which combine fewer polymers. This is vital as plastic items are generally made from highly customised range of polymers with additives to meet specific requirements and aesthetics of each product. This complicates recycling and it has been estimated that design improvements to make plastic items more recyclable could halve the costs of recycling plastic packaging.⁹⁵ Moves towards more recyclable plastics can be presented as a way for producers to reduce the reputational, liability and transition risks they face.

Engage with waste management and recycling companies

Waste management and recycling companies require insurance for various aspects of their operations. Insurers which underwrite them should be particularly aware of how these companies manage and recycle plastic. They can work with their clients to ensure measures are in place to prevent leakage of plastics into the environment and to maximise the recycling of plastic.

94 As You Sow (2018). As You Sow Launches Investor Alliance to Engage Companies on Plastic Pollution. Available at: <https://www.asyousow.org/blog/2018/6/14/as-you-sow-launches-investor-alliance-to-engage-companies-on-plastic-pollution>

95 World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company (2016). The new plastics economy: Rethinking the future of plastics. Available at: <https://www.ellenmacarthurfoundation.org/publications/the-new-plastics-economy-rethinking-the-future-of-plastics>



Engage with cities and local authorities on recycling and waste management

Cities, municipalities and other local authorities are central to efforts to better manage plastic waste. At the same time, plastic pollution poses a clear threat to such authorities, as it pollutes the environment of residents, contributes to flooding as a result of clogged rains, and contaminates water supplies.

These authorities engage with insurers in a number of ways, both to secure insurance for their day-to-day operations and to secure insurers' support in guaranteeing municipal bonds. Insurers can therefore work with local authorities to better manage plastic pollution risks through careful management of plastic waste.

Insurers can encourage cities to take measures including:

- Expanding and improving the separate collection and sorting of plastic waste, so that the recycling industry receives higher quality inputs
- Investing in incentive structures for recycling
- Integrating recycled and recyclable plastics as well as plastic alternatives into green public procurement approaches
- Reviewing waste management systems to ensure that plastic is not leaking into the environment
- Introducing targeted deposit schemes to reduce plastic litter and boost recycling.
- Measuring, setting targets for and monitoring their plastic footprint (the Plastic Disclosure Project survey, for example, is a tool that is designed to be used by municipalities as well as businesses)⁹⁶

Targeted deposit schemes in particular have already proven particularly successful for achieving high collection rates for beverage containers, and Germany, Denmark, Finland, the Netherlands and Estonia reached an average 94% collection rate for PET⁹⁷ in 2014 as a result of specific deposit schemes for PET bottles.⁹⁸

One approach would be for insurers to encourage cities they are working with to join global initiatives, in particular the Plastic Smart Cities initiative launched in October 2019.⁹⁹ This joint initiative of EUROCIITIES and WWF was adopted by Amsterdam, Oslo, Nice and Izmir when it was launched and calls on other cities and tourist destination to commit to fight plastic pollution. The initiative also provides a platform to share best practices on innovations as well as to implement tried and tested solutions. As the initiative will set targets and measure cities' progress in reducing plastic pollution, it would provide a useful benchmark and mechanism for insurers to monitor cities' progress in tackling plastic pollution.

The measures outlined above can reduce the risks faced by local authorities and protect their infrastructure. Insurers could therefore consider making reduced premiums dependant on such measures. In addition, insurers may be able to further support efforts to counter plastic pollution by offering innovative insurance products to cities and local authorities in the future, as mentioned in section 5.4 above.

Furthermore, insurers' investments could support cities in improving their waste management and recycling infrastructure. As it becomes increasingly difficult to export plastic waste, countries and cities need to develop their own infrastructure to better, collect, sort and safely dispose of or recycle plastics. They will likely need to raise significant finance to do so. Insurers could invest in Green City Bonds (bonds issued by cities to fund green projects and climate-friendly infrastructure) designed to finance new plastic waste management and recycling infrastructure or to upgrade

96 <https://www.plasticdisclosure.org>

97 PET stands for polyethylene terephthalate, a form of polyester commonly used in drinks bottles and other packaging

98 European Commission (2018). A European Strategy for Plastics in a Circular Economy. Available at: <https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf>

99 EUROCIITIES (2019). EUROCIITIES and WWF launch Plastic Smart Cities Initiative. Available at: <http://www.eurocities.eu/eurocities/documents/EUROCIITIES-and-WWF-launch-Plastic-Smart-Cities-initiative-WSPQ-BH9U7Y>

existing infrastructure. For example, in January 2019, the City of Reykjavík issued a USD 33 million green bond to fund buildings, transport, waste management, land use and agriculture, and adaptation and resilience projects. The City of Reykjavík Green Bond Framework explains that that one of the nine categories which the bond will be used for is consumption and waste. In particular, it aims to reuse 60% of plastic waste by 2020.¹⁰⁰

In such cases, insurers can combine agendas around pollution with those connected with human rights and gender concerns. While formal waste collection is dominated by men, women participate in large numbers in informal waste collection, where they face poor working conditions.¹⁰¹ Women and men in both informal and formal waste collection face social stigma and economic deprivation. In addition, child labour is prevalent in informal waste collection and sorting. Where insurers are involved with projects to improve or expand waste management and recycling infrastructure, they should also consider how these efforts can be leveraged to increase women's participation in formal and semi-formal work, improve the conditions of women and men working in the sector, and eliminate child labour in the waste value chain.

In 2018, the PSI and ICLEI – Local Governments for Sustainability (the leading global network of over 1,500 cities, towns and regions) launched the *Insurance Industry Development Goals for Cities* at the ICLEI World Congress in Montréal.¹⁰² These goals serve as a global action framework for the insurance industry to help make cities inclusive, safe, resilient and sustainable, in line with UN Sustainable Development Goal 11, and include a specific goal to promote healthy lifestyles and prevent pollution. This PSI-ICLEI initiative could therefore serve as a global platform for insurers and cities around the world to tackle plastic pollution and other key sustainability risks in a strategic and practical way.

Engage with fast-moving consumer goods (FMCG) companies

Many FMCG companies, which tend to have high plastic footprints, are taking steps to reduce their dependence on single-use plastics. Unilever, which owns various food, beauty, health and cleaning brands, is responsible for producing 700,000 tonnes of new plastic a year. It has introduced plans to reduce this figure by using more recycled plastics and plastic alternatives. Unilever has stated that this shift has been prompted by a need to remain relevant given the sustainability concerns of younger generations.¹⁰³ The company has recently committed to recycle as much plastic as it creates by 2025. Procter and Gamble has also announced plans to halve its virgin petroleum plastic use by 2030,¹⁰⁴ while Nestle has committed to phase out all non-recyclable plastics from its wrappers by 2025¹⁰⁵ and Coca-Cola to make bottles from 50% recycled plastics and to recycle as many bottles, cans and other packaging as it produces by 2030.¹⁰⁶

Such initiatives have come after significant pressure on these companies to share their plastic footprint and plans to reduce it. Yet, many companies, including PepsiCo, L'Oréal and H&M, have still not even made their plastic production public. And the seriousness and ambition of some existing plans have been questioned. For example, Coca-Cola has been criticised for its focus on increasing recycling without making attempts to reduce the plastics it is putting out into the world, as the number of single-use plastic bottles it sells has been rising in recent years.¹⁰⁷

100 Reykjavíkurborg (2019). The City of Reykjavík Green Bond Framework. Available at: <https://ml-eu.globenews-wire.com/Resource/Download/a1cfba55-c1bd-49ea-ac3b-51ad31d18a5a>

101 GA Circular (2019). The Role of Gender in Waste Management. Available at: <https://oceanconservancy.org/wp-content/uploads/2019/06/The-Role-of-Gender-in-Waste-Management.pdf>

102 United Nations Environment Programme (2018). United Nations-backed insurance industry initiative and network of local governments launch global goals to build resilient and sustainable cities. Available at: <https://www.unepfi.org/psi/wp-content/uploads/2018/06/PSI-ICLEI-press-release-Montreal.pdf>

103 BBC News (2019). Unilever to cut plastic use to appeal to Gen Z. Available at: <https://www.bbc.com/news/business-49923460>

104 Procter & Gamble (2019). Procter & Gamble announces new global commitment to reduce plastic. Available at: <https://us.pg.com/blogs/Plastic50by2030/>

105 Nestle (2019). Nestlé accelerates action to tackle plastic waste Available at: <https://www.nestle.com/media/pressreleases/allpressreleases/nestle-action-tackle-plastic-waste>

106 Coca-Cola. Coca-Cola is working towards a World Without Waste. Available at: <https://www.coca-cola.eu/news/packaging-and-sustainability-infographic-2018/> (Accessed 29/10/2019)

107 Kate Taylor (2018). Coca-Cola is being slammed for its massive solution to the 'plastics epidemic' as critics call for a world where plastic bottles are extinct. Business Insider. Available at: <https://www.businessinsider.com/coca-cola-debuts-massive-recycling-efforts-but-critics-remain-2018-1>



Lush:

Embracing the circular economy

Consumer goods companies that will thrive in the future will be those able to adopt the principles of the circular economy. Some, like beauty company Lush, are already doing so. A total of 35% of Lush's range is made up of solid products, like shampoo bars, which are sold without any packaging,¹⁰⁸ and in 2019 Lush opened its first plastic-free store in the UK.¹⁰⁹ Where packaging is used, pots and bottles are made entirely from post-consumer recycled plastics and can be returned to Lush shops for recycling. Lush encourages customers to do so by offering a free face mask for every five pots returned. The company is also experimenting with using ocean plastics in its packaging with the Ocean Legacy Foundation.¹¹⁰ The company's experience shows how a combination of plastic-free design and circular use of plastic can radically reduce the plastic footprint of consumer goods companies.

Large multinational companies, many of them responsible for the highest levels of plastic pollution worldwide, are responding to public pressure and to negative publicity associated with campaigns to name and shame the worst polluters, such as the "Break Free from Plastic" report. Insurers should also engage proactively with these companies. They have an important role to play as close and constructive partners, seeking increasingly ambitious plans to cut plastic use and supporting companies in implementing these plans.

Engage with UN and other international agencies

Plastic pollution is moving up the world agenda and represents an important concern for many UN and other international agencies. By engaging with them, insurers have the opportunity to contribute their expertise in understanding and managing new and complex risks, as well as in shaping global responses. In particular, insurers can collectively contribute to and influence global approaches to plastic pollution and other risks through the PSI, as a United Nations-backed collaborative initiative for insurers to engage on sustainability issues. Collectively, the PSI provides the industry with a voice and platform to engage internationally and particularly with UN bodies. In addition to UNEP, insurers can engage with other relevant UN and international bodies, including the International Maritime Organization, the World Health Organization, the International Labour Organization, the UN Framework Convention on Climate Change, the UN Office for Disaster Risk Reduction, and so on.

Insurers can also consider joining the Global Partnership on Marine Litter,¹¹¹ a multi-stakeholder partnership that brings together all actors working to prevent marine litter and microplastics.

108 Lush. Reduce, Reuse, Recycle. Available at: https://www.lushusa.com/stories/article_reduce-reuse-recycle.html (Accessed 29/10/2019)

109 Rachel Cooper (2019). Lush to open plastic-free store in the UK. Climate Action. Available at: <http://www.climateaction.org/news/lush-to-open-plastic-free-store-in-the-uk>

110 Lush. Turning Ocean Plastic into Packaging. Available at: https://www.lushusa.com/stories/article_ocean-legacy-packaging.html (Accessed 29/10/2019)

111 [Gpmarinelitter.org](http://gpmarinelitter.org)

5.10 Disclose plastic pollution risks and opportunities in relevant disclosure and reporting frameworks

Publicly disclosing plastic pollution risks and opportunities is an opportunity for insurers to be leaders in combatting plastic pollution. This does not necessarily require the creation of new disclosure and reporting frameworks. Rather, plastics disclosure can be integrated into existing frameworks, such as annual reports or sustainability reports, or global disclosure and reporting frameworks like the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD), PSI, PRI, CDP, Global Reporting Initiative (GRI), and the UN Global Compact Principles. Plastic pollution is a natural fit with disclosure and reporting frameworks with a climate focus due to the important climate implications of plastic manufacture and waste.

As part of such reporting, insurers can calculate their plastic footprint. This is a powerful way to measure a company's progress and to set clear goals. Insurers can refer to the Plastic Disclosure Project to measure and understand their plastic footprint.¹¹² While calculating their own plastic footprint is important, due to the nature of insurance business, their internal operations are likely to have a relatively low footprint. Therefore, an important next step is for insurers to request insured clients and investee companies to do the same. This will allow insurers to begin to understand the plastic footprint of their insurance and investment portfolios. This will both help guide insurers' own decision making and provide a powerful mechanism to promote the plastic pollution agenda among other businesses and sectors.

112 <https://www.plasticdisclosure.org>



6. Role of other key actors in the insurance industry

Brokers serve as intermediaries between clients and insurers, and between insurers and reinsurers. Although brokers are neither risk carriers nor asset owners, they play a crucial role in the insurance industry value chain through the sharing of information between insurers and insureds, and between reinsurers and reinsureds. In particular, brokers have the ability to either facilitate or hinder discussions on ESG risks. Brokers should increase their efforts in facilitating these discussions. This facilitator role also applies to agents, investment consultants and advisors, and ESG data providers.

Furthermore, international regulatory expectations raised by soft law, such as the Organisation for Economic Co-operation and Development (OECD) Due Diligence Guidance for Responsible Business Conduct, hold brokers to the same responsibilities as other companies within the industry. Brokers should be expected to conduct due diligence on ESG risks and to ensure responsible business conduct. Therefore, brokers should consider how the actions to combat plastic pollution outlined in this paper could be integrated in their own business and ESG approach.

Given the great deal of uncertainty around the level of impact of plastic pollution, particularly on human and animal health, reinsurers have an important role to play. Given the volume of risks which they see around the world, they may be the first to detect changes in claims brought about by plastic pollution and have a role in alerting their insurance company clients. Reinsurers should therefore take particular care to follow the latest evidence on the effects of plastic pollution and to track any possible impact in their claims data.

Just like climate change-related risks, plastic pollutions risks can affect insurance and investment portfolios in the form of physical, transition, liability and reputational risks. Therefore, insurance and financial regulators should also look into the risks surrounding plastic pollution and help insurers to understand the serious implications of plastic pollution for their business, as well as the opportunity they have to contribute to efforts to reduce plastic pollution. Regulators can encourage insurance companies to include plastic pollution as a risk factor in their ESG risk approach, as well as in their disclosure of material sustainability risks and opportunities.

Working together with key stakeholders, the insurance industry—as risk managers, insurers and investors—can be a driving force in tackling the global sustainability issue of plastic pollution, marine plastic litter and microplastics. In this way, the industry can accelerate the transition to a low-carbon, circular economy and a sustainable future for all.



7. Useful resources and tools

- **Underwriting environmental, social and governance risks in non-life insurance business.** PSI working paper providing guidance on ESG risks in non-life insurance underwriting and how to manage them
- **Plastic Disclosure Project.** Tools to manage and reduce plastic waste by measuring and understanding your plastic footprint
- **Valuing plastic. The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry.** UNEP research paper on measuring, managing, disclosing more sustainable use of plastic
- **Risk unwrapped: plastic pollution as a material business risk.** Paper produced by Client Earth providing an overview of the business risks associated with plastic pollution
- **European Commission. 2018. A European Strategy for Plastics in a Circular Economy.** Report outlining the EU's plastics approach
- **Break Free from Plastic Global Brand Audit.** Annual report on the world's worst corporate plastic polluters from Greenpeace



8. The Principles for Sustainable Insurance

The approaches recommended in this document are all in line with UNEP's Principles for Sustainable Insurance. This paper suggests how each of the four principles outlined below can be employed in the context of plastic pollution as an ESG issue.

PRINCIPLE 1

We will embed in our decision-making environmental, social and governance issues relevant to our insurance business

Company strategy

- Establish a company strategy at the Board and executive management levels to identify, assess, manage and monitor ESG issues in business operations
- Dialogue with company owners on the relevance of ESG issues to company strategy
- Integrate ESG issues into recruitment, training and employee engagement programmes

Risk management and underwriting

- Establish processes to identify and assess ESG issues inherent in the portfolio and be aware of potential ESG-related consequences of the company's transactions
- Integrate ESG issues into risk management, underwriting and capital adequacy decision-making processes, including research, models, analytics, tools and metrics

Product and service development

- Develop products and services which reduce risk, have a positive impact on ESG issues and encourage better risk management
- Develop or support literacy programmes on risk, insurance and ESG issues

Claims management

- Respond to clients quickly, fairly, sensitively and transparently at all times and make sure claims processes are clearly explained and understood
- Integrate ESG issues into repairs, replacements and other claims services

Sales and marketing

- Educate sales and marketing staff on ESG issues relevant to products and services and integrate key messages responsibly into strategies and campaigns
- Make sure product and service coverage, benefits and costs are relevant and clearly explained and understood

Investment management

- Integrate ESG issues into investment decision-making and ownership practices (e.g. by implementing the Principles for Responsible Investment)

PRINCIPLE 2

We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions

Clients and suppliers

- Dialogue with clients and suppliers on the benefits of managing ESG issues and the company's expectations and requirements on ESG issues
- Provide clients and suppliers with information and tools that may help them manage ESG issues
- Integrate ESG issues into tender and selection processes for suppliers
- Encourage clients and suppliers to disclose ESG issues and to use relevant disclosure or reporting frameworks
- Insurers, reinsurers and intermediaries
- Promote the adoption of the Principles
- Support the inclusion of ESG issues in professional education and ethical standards in the insurance industry

PRINCIPLE 3

We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues

Governments, regulators and other policymakers

- Support prudential policy, regulatory and legal frameworks that enable risk reduction, innovation and better management of ESG issues
- Dialogue with governments and regulators to develop integrated risk management approaches and risk transfer solutions

Other key stakeholders

- Dialogue with intergovernmental and non-governmental organisations to support sustainable development by providing risk management and risk transfer expertise
- Dialogue with business and industry associations to better understand and manage ESG issues across industries and geographies
- Dialogue with academia and the scientific community to foster research and educational programmes on ESG issues in the context of the insurance business
- Dialogue with media to promote public awareness of ESG issues and good risk management

PRINCIPLE 4

We will demonstrate accountability and transparency in regularly disclosing publicly our progress in implementing the Principles

- Assess, measure and monitor the company's progress in managing ESG issues and proactively and regularly disclose this information publicly
- Participate in relevant disclosure or reporting frameworks
- Dialogue with clients, regulators, rating agencies and other stakeholders to gain mutual understanding on the value of disclosure through the Principles



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About UNEP's Principles for Sustainable Insurance Initiative (PSI)

Endorsed by the UN Secretary-General and insurance industry CEOs, the Principles for Sustainable Insurance (PSI) serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities—and a global initiative to strengthen the insurance industry's contribution as risk managers, insurers and investors to building resilient, inclusive and sustainable communities and economies. Developed by the UNEP Finance Initiative, the PSI was launched at the 2012 UN Conference on Sustainable Development, and is the largest collaborative initiative between the United Nations and the insurance industry.

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