



# VALUING PLASTIC

The Business Case for Measuring, Managing  
and Disclosing Plastic Use in the  
Consumer Goods Industry

EXECUTIVE SUMMARY



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KLIMA- OG MILJØDEPARTEMENTET

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**Thank you to the project contributors** (Alice Sireyjol Trucost, Anna Georgieva Trucost, Sarah Wainwright Trucost, Apurvee Haridwaj Trucost, Siddhartha Joshi Trucost, Steven Bullock Trucost, Chaoni Huang Trucost, Amudha Gunasekaran Trucost, Bindhya Manoj Trucost); **methodology reviewers** (Chelsea Rochman Aquatic Health Program University of California Davis, Mark Browne National Center for Ecological Analysis & Synthesis University of California Santa Barbara, Heather Leslie Institute for Environmental Studies VU University Amsterdam); **editorial reviewers** (Vincent Sweeney UNEP, Heidi Savelli UNEP, Tessa Goverse UNEP, Elisa Tonda UNEP, Aihnoa Carpenter UNEP, Doug Woodring Ocean Recovery Alliance, Emily Utter PDP, Erik Floyd PDP, Pua Mench PDP, Nathaniel John Maynard PDP, Conrad MacKerron As You Sow, Saskia van Gendt Method Home, James Ewell Green Blue, Leila Munroe NRDC, Darby Hoover NRDC, Ben Ridley Credit Suisse, J.Robert Gibson City University of Hong Kong, Antony Wood AK Partners, Jill Boughton W2Worth Innovations, José Miguel Friz Valor Sustentable Chile).

**Author:** Julie Raynaud (Trucost), **Editor:** James Richens (Trucost), Andrew Russell (PDP),  
**Designer:** Rebecca Edwards (Trucost)

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## ABOUT UNEP

Established in 1972, the United Nations Environment Programme is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP's Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted by the international community in 1995 and "aims at preventing the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment."

## ABOUT THE GLOBAL PARTNERSHIP ON MARINE LITTER

The Global Partnership on Marine Litter (GPML) is a new global partnership that acts as a coordinating forum, bringing together diverse organizations working in the same field and encouraging governments, non-governmental organizations, scientists and academics to collaborate on marine litter issues. The new partnership, led by UNEP, was announced in June 2012 at a launch event during the Rio+20 conference in Rio de Janeiro. It builds on the Honolulu Strategy and seeks to protect human health and the global environment by the reduction and management of marine litter as its main goal. To join or learn more about the GPML visit [www.gpa.unep.org](http://www.gpa.unep.org) or contact the secretariat (UNEP/GPA) at [gpml@unep.org](mailto:gpml@unep.org)

## ABOUT PLASTIC DISCLOSURE PROJECT

The Plastic Disclosure Project asks organisations to measure, manage, disclose and benefit from more sustainable use of plastic. It seeks a world in which plastic adds value for consumers and businesses without negatively impacting the environment. The PDP requests annual reporting regarding the production, use, handling and management of plastic and plastic waste by organisations. By measuring the amount of plastic that flows through an organisation, efficiencies can be gained in cost and waste reduction, new design, new materials, and better recycling. By reviewing how the material is managed, organisations can recognise risks and seize opportunities that their competitors may miss. By disclosing, organisations demonstrate leadership, and attract benefits in employee engagement, supplier management, customer loyalty, and access to capital. Initially designed for large corporates, institutions such as hospitals, universities, government offices, stadia, clubs, facilities, events, sports associations and teams participate and benefit. Interested parties are welcome to contact PDP at [info@plasticdisclosure.org](mailto:info@plasticdisclosure.org).

## ABOUT OCEAN RECOVERY ALLIANCE

Ocean Recovery Alliance is a not-for-profit organisation based in Hong Kong and California. It is focused on bringing innovation, technologies, creativity and collaborations together to address some of the challenges that face the ocean and our broader environment. The Ocean Recovery Alliance has three global projects focussed on plastic waste issues, namely the PDP and Global Alert - both of which were announced as Clinton Global Initiatives; and the Plasticity Forum - a creative discussion on how to harness plastic in new ways, both "pre" and "post" consumer use.

## ABOUT TRUCOST

Trucost has been helping companies, investors, governments, academics and thought leaders to understand the economic consequences of natural capital dependency for over 12 years. Our world leading data and insight enables our clients to identify natural capital dependency across companies, products, supply chains and investments; manage risk from volatile commodity prices and increasing environmental costs; and ultimately build more sustainable business models and brands. Key to our approach is that we not only quantify natural capital dependency, we also put a price on it, helping our clients understand environmental risk in business terms.

# EXECUTIVE SUMMARY

This research was conducted by natural capital analysts Trucost on behalf of the Plastic Disclosure Project (PDP). It was supported by the United Nations Environment Programme and the Global Partnership on Marine Litter (GPML).

## OBJECTIVES

**Plastic is one of the most useful and important materials in modern society.** Life without the vast range of products and technologies it enables is almost unthinkable. Plastic preserves and protects food and medicine helping us lead healthy lives. It is used to make electronic devices like computers and smartphones that bring people together, and it helps make transport more fuel efficient through its use in vehicles. The versatility and low price of plastic compared with alternatives is reflected in the rapid growth of the market for the material.<sup>1,2</sup>

**But the environmental impacts of plastic cannot be ignored.** Concerns are growing about its impact on the world's ecosystems. Marine wildlife is particularly vulnerable, and harmed through entanglement and ingestion of plastic. There is a risk of microscopic particles of plastic transferring toxins into the food chain. Fields, streets and beaches are increasingly littered with plastic bottles, bags and other trash. Plastic manufacturing processes use non-renewable resources, such as oil, and release greenhouse gases into the atmosphere contributing to climate change. In addition, the use of chemical additives in plastic may be hazardous to human health. All of these impacts are gaining increased attention from stakeholders such as non-governmental organisations (NGOs), international institutions, governments, and the general public.<sup>3,4,5,6</sup>

**The objective of this report is to help companies manage the opportunities and risks associated with plastic use.** It articulates the business case for companies to improve their measurement, disclosure and management of plastic use in their designs, operations and supply chains. In order to provide a sense of scale, the report sets out to quantify the physical impacts of plastic use translated into monetary terms. This metric can be seen as the current value-at-risk to a company, should these external impacts be realised internally through mechanisms like strengthened regulation, loss of market share, or increased price of raw materials and energy. This metric can also be used to help understand the magnitude of the opportunities, and the tangible benefits to stakeholders, including shareholders, of using plastic in an environmentally sustainable way.

## METHODOLOGY

**The use of plastic causes environmental and social impacts.** For example, incinerating plastic at its end-of-life has associated air pollution impacts. Applying 'natural capital valuation' allows these impacts to be expressed in monetary terms, reflecting the scale of damage caused. The overall value or 'natural capital cost' gives an indication of the financial cost to companies were they to internalise impacts associated with their current practices. These costs can also be factored into business and investment decision making.

In order to quantify the natural capital cost of the impacts of plastic, the high-level methodology follows six steps: sector selection, plastic use quantification, scope and boundary selection, impact quantification, and natural capital valuation and application.

**As with any innovative research, there are some limitations.** For instance, while the upstream impacts of producing plastic feedstock are included, the impacts of the manufacturing stage are excluded due to their diversity. Downstream impacts, in particular of plastic waste reaching the ocean when littered, are likely to be underestimated due to the absence of robust data and scientific research, for example around the impact of microplastics.

Finally, this report looks at plastic in isolation. It was beyond the scope of this study to identify alternatives, and contrast the impacts of plastic with each of these alternatives. For example, the reduced greenhouse gas emissions due to lighter transport of plastic bottles, or the high reuse rates and low toxicology of glass are not considered here.

## RESULTS

**The analysis identifies a range of risks and opportunities facing companies that are intensive users of plastic.** Institutional investors are also exposed through the shares they own in these companies as well as the project finance they provide. Pension funds, for instance, have a fiduciary duty to protect the value of their investments.

Risks include the impact of tougher environmental legislation such as bans on disposable plastic bags, carbon pricing schemes and chemicals regulation, damage done to the reputation of brands targeted by campaigners over their association with plastic litter, clean-up costs and disruption to

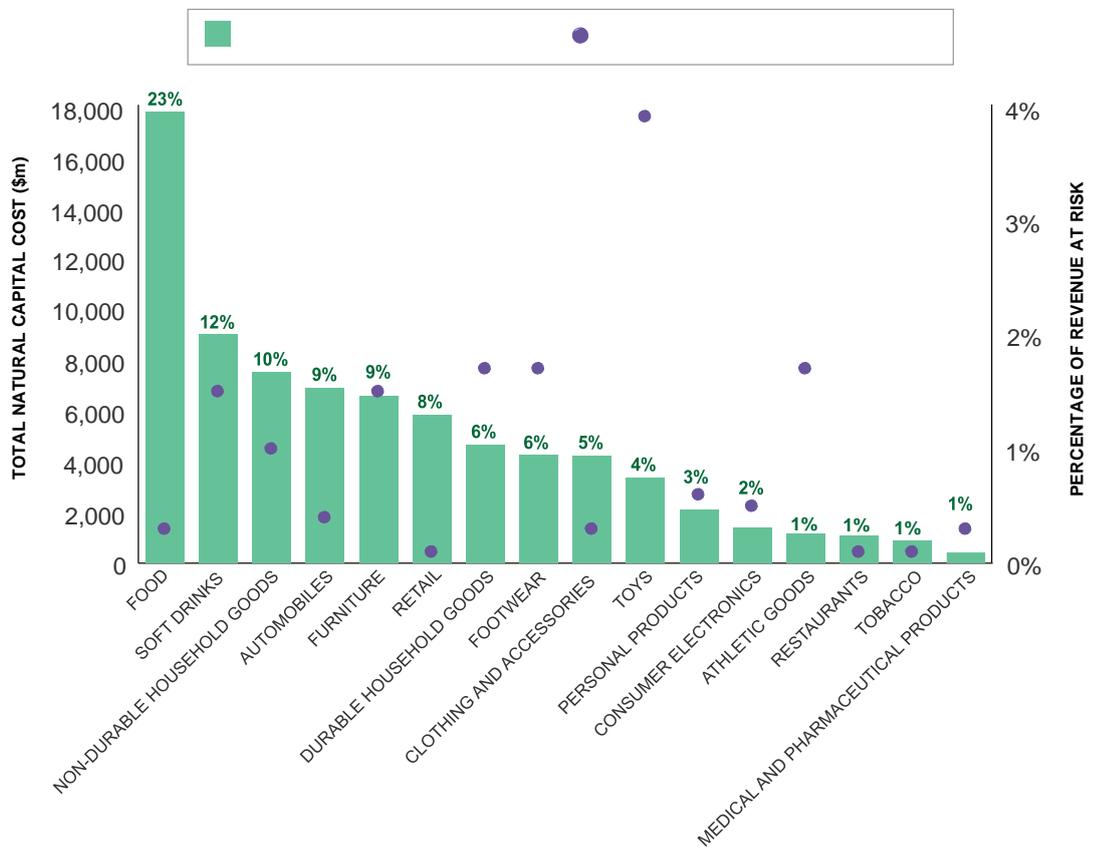
the plastic supply chain caused by resource scarcity and price volatility. Opportunities include cutting costs through more efficient use of plastic, developing new revenue streams through 'closed loop' business models that recover plastic as a useful resource, and winning customers by demonstrating more sustainable products.

**The research identifies where plastic is used most intensively by focusing on 16 consumer goods sectors where plastic is commonly used.** The data is presented by sector, and divided into the plastic used directly within products and packaging, and indirectly within their supply chain. This information provides valuable insights to help companies focus their efforts to manage plastic.

The toy, athletic goods and durable household goods sectors use the most plastic in products per US\$1 million revenue. The soft drinks, personal products and pharmaceutical sectors are among the most intensive users of plastic in packaging. The retail, restaurant and tobacco sectors use the most plastic per \$1m revenue in their supply chains. This could be explained by their position down the supply chain and their reliance on the agricultural sector.

**This research then analyses the exposure of companies to these risks and opportunities by expressing quantities of plastic used as a natural capital cost.** The results show that the total natural capital cost of plastic used in the consumer goods industry is over \$75bn per year. Broken down by sector, food companies are by far the largest contributor to this cost, responsible for 23% of the total natural capital cost (see figure 1). The results also show each sector's natural capital intensity – or its natural capital cost per \$1m of annual revenue. The toy sector has by far the highest intensity, at 3.9% of revenue.

FIGURE 1: TOTAL NATURAL CAPITAL COST AND INTENSITY OF SELECTED SECTORS



**\$75bn**

The natural capital cost of plastic in the consumer goods sector per year

*Corresponds approximately to over 80 million tonnes of plastic. Trucost calculations derived from, but not limited to, World Bank [7]; PlasticsEurope [8]; Eurostat [9], and the US EPA [10] datasets (full set of references and methodologies available in appendices 3 and 4 of this report).*

**These findings hold significant impacts for companies.** On the one hand, companies in the food, soft drinks and non-durable household goods sectors have the largest natural capital costs in absolute terms and thus are more likely to face reputational and legislative risks from their association with the environmental impacts of plastic, especially litter from packaging. On the other hand, companies in the toy, athletic goods and footwear sectors have the highest natural capital intensity, meaning that a higher proportion of their revenue is at risk. Economic, reputational, legislative and other risks, or missing related opportunities, could extract significant value from these businesses if they had to internalise the full cost of their plastic use impacts.

**The research compares the natural capital cost of plastic for sectors depending on the longevity of the product they make.** Companies in sectors such as food and non-durable household goods, which make disposable plastic products and use plastic packaging, may face

# \$13bn

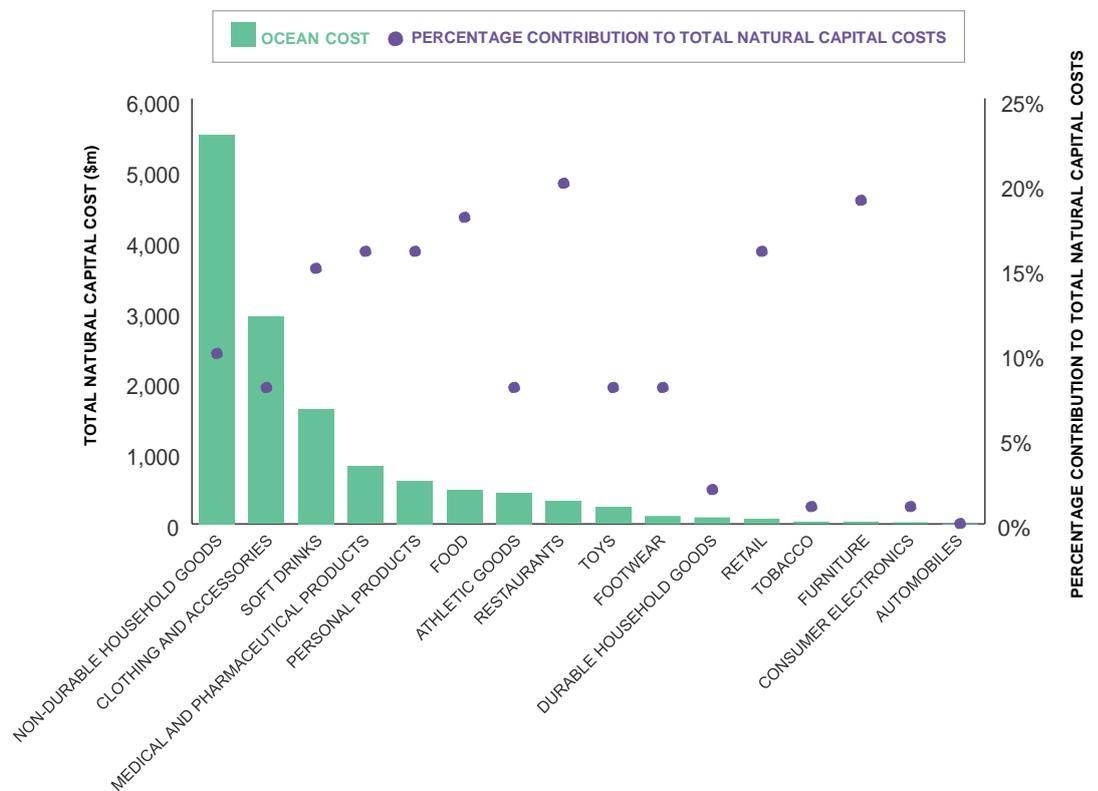
The total natural capital cost to marine ecosystems of plastic littering per year

much higher risks than those in sectors such as cars and athletic goods where products have a much longer lifetime. This is because the use of plastic in these instances may not seem efficient, given the durability of the material and the short service life of the product and packaging types they manufacture.

**The research drills down into and assesses the main quantifiable impacts of plastic use in products and packaging.** It relies upon the best available research to date. However, because of the nascent science in this field, several known or suspected impacts could not be fully assessed. This is particularly true regarding downstream impacts, i.e. impacts relating to littering and disposal.

With current knowledge, across all consumer goods sectors, over 30% of the natural capital costs come from greenhouse gas emissions released upstream in the supply chain from the extraction of raw materials and manufacturing of plastic feedstock. The most significant downstream impact is marine pollution, which has a natural capital cost of at least \$13bn (see figure 2). This study is the first to apply natural capital valuation to impacts of plastic on the marine environment. Trucost supplemented its existing modelling techniques by gathering and analysing academic studies on the impact of plastic on marine ecosystems. Impacts include economic losses incurred by fisheries and tourism as well as time spent cleaning up beaches.

**FIGURE 2: TOTAL NATURAL CAPITAL COST OF PLASTIC IN THE OCEAN (\$) AND PERCENTAGE CONTRIBUTION TO TOTAL NATURAL CAPITAL COST PER SECTOR**



Total natural capital costs corresponds approximately to over 80 million tonnes of plastic. Trucost calculations derived from, but not limited to, World Bank [7]; PlasticsEurope [8]; Eurostat [9], and the US EPA [10] datasets (full set of references and methodologies available in appendices 3 and 4 of this report).

**The impacts of plastic vary around the world, based on background conditions and management practices.** Companies face higher natural capital costs if they purchase or treat plastic at its end-of-life in Asia as opposed to North America, Europe or Oceania. This is due to higher pollution intensity levels of manufacturing in Asia and its lack of adequate waste management facilities. The finding is of concern given the growth in Asian economies. A limitation of this study is that transboundary waste trade has not been taken into account. The downstream, or end-of-life, natural capital costs of certain regions, such as Oceania shipping part of its waste to other countries, may thus have been underestimated.

This study focuses on plastic impacts in absolute terms, not in comparison to any alternatives. However it should be noted that recent studies commissioned by plastic manufacturers associations, such as the American Chemistry Council (ACC) and Plastics Europe, suggest that there are significant benefits (in terms of energy used and greenhouse gas emissions) associated with the use of plastic (mainly in packaging) such as reduced food waste and lower fuel use in transportation.<sup>11,12</sup> Similarly, this report suggests that current recycling and energy recovery practices save consumer goods companies around \$4bn per year. The emphasis should not be on systematically moving away from plastic but rather in using it in an efficient and environmentally-sustainable way.

# \$4bn

The amount saved by consumer goods companies through good management of plastic, through recycling for example.

Over a quarter of these savings were generated through initiatives in the food sector and 17% in the soft drinks sector.

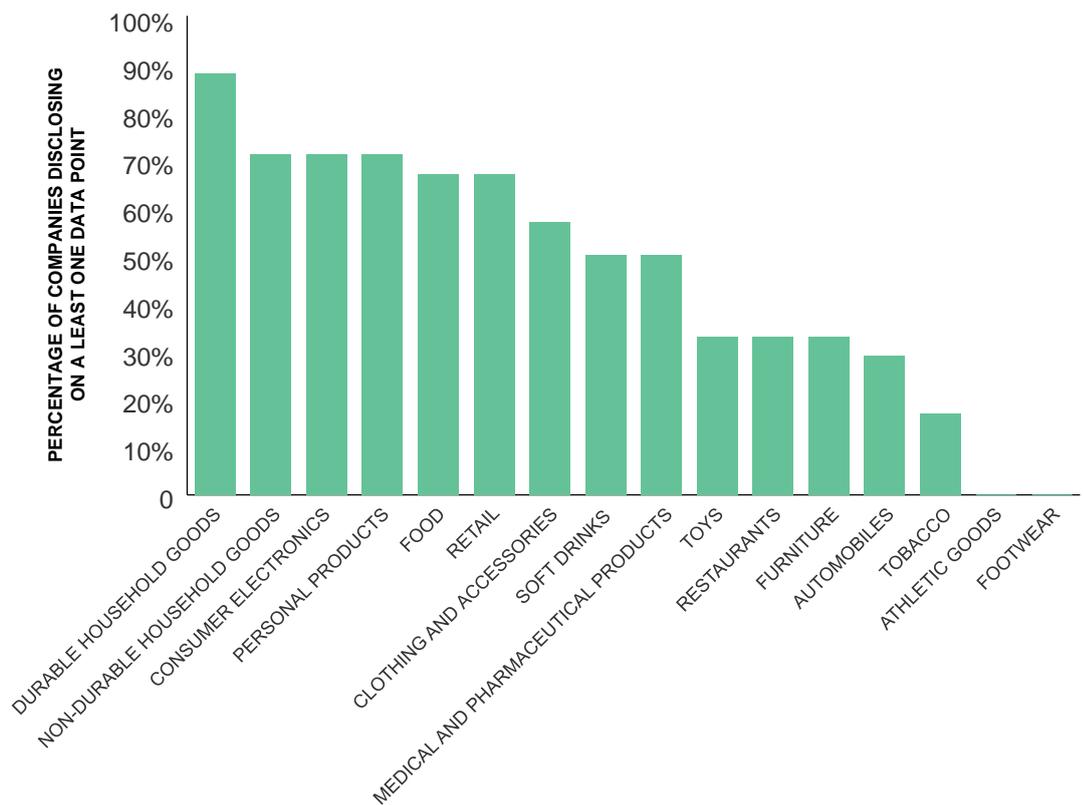
Good management of plastic, through recycling for example, saves consumer goods companies \$4bn per year. Over a quarter of these savings were generated through initiatives in the food sector and 17% in the soft drinks sector.

**The research assesses the largest publicly-listed companies of each of the 16 target sector by revenue - 100 in total.** Each company's plastic usage is estimated, using industry data, modelling, and any disclosures specific to that company. The report contains 16 analyses that offer sector-specific results and company-level insight.

The research also shows whether companies disclose information on plastic. Due to low disclosure levels, most of the data has been modelled and should only be considered indicative of the magnitude. As the impacts of plastic gain more prominence, companies may be expected by their stakeholders to improve rates of disclosure. For example, this information is useful to inform institutional investors interested in protecting the value of their investments. Asset managers could engage with these companies to find out how they plan to manage the risks and opportunities of plastic.

**Levels of disclosure on plastic are poor.** Only around half of the 100 companies assessed reported at least one item of quantitative data on plastic (see figure 3). Disclosure rates vary widely with no companies in the footwear and athletic goods sectors reporting any useable quantitative data points, compared with 88% of firms in the durable household goods sector and 71% in the personal products sector. Quantitative data points span from total quantity of plastic used per year by the company to tonnage of plastic saved due to one recycling initiative; data coverage varies widely and is often poor. Even when a company is classified as a "discloser", it may mean that this company disclosed only one data point with limited coverage. Disclosed data was used in the research where available.

FIGURE 3: PERCENTAGE OF COMPANIES THAT DISCLOSE ON AT LEAST ONE DATA POINT



Trucost calculations derived from companies' public disclosures (full set of references and methodologies available in appendices 3 and 4 of this report).

**Currently, there is no correlation between a sector's disclosure rate and its plastic intensity or absolute natural capital cost due to plastic.** This means that sectors which face the most significant risks to their revenues from legislation, competition and consumer demand regarding plastic need to consider being more transparent about how they are managing the potentially material issue. It also suggests that disclosure may be more driven by external factors, such as legislation and reputation, rather than an internal understanding of risks and opportunities.

Levels of disclosure on plastic are

# POOR

Of the 100 companies assessed, less than

# HALF

reported one or more items of relevant quantitative data.

## RECOMMENDATIONS

**Based on these findings, the research makes a series of recommendations to companies.**

Taking action to reduce the risks of plastic while benefiting from the opportunities first involves raising the awareness of a company's executive board. The findings of this research provide the information needed to build a business case for the board to sanction action. The research recommends that companies establish a strategy to reduce the impacts of plastic, including setting targets with deadlines.

Companies can mitigate plastic-related risks and take advantage of the opportunities by improving their measurement, management and disclosure of plastic. Initially, this means measuring and reporting their use of plastic, as many companies already do with carbon emissions and other environmental impacts. Best practice frameworks to support companies in doing this in a standardised way include the Plastic Disclosure Project.

In order to properly identify the risks and opportunities, and manage these properly, this study recommends that companies greatly improve the quantity and quality of the information they gather and report on plastic. Relevant data includes the tonnage of plastic used in a company's operations and supply chain. This figure could be broken down into different types of plastic, such as polyethylene terephthalate used in drinks bottles and polystyrene used in hamburger boxes, as well as the amount of recycled plastic or bio-plastic used (although bio-plastics do not always provide an environmentally-positive alternative to conventional plastics). Companies could also disclose how plastic is used in products and packaging. Reporting on the fate of plastic at the end of its life is relevant, such as whether it is disposed of to landfill or incineration with or without energy recovery, or whether it is recycled or reused.

By publicly reporting on plastic management, companies can demonstrate to stakeholders including governments, investors and campaign groups that they take their environmental responsibilities seriously. Companies that move quickest to report are most likely to gain credit by being seen as a leader on the issue.

In the longer term, progress on plastic is likely to require companies to work in partnership. The research recommendations identify a range of organisations and suggest broad areas for collaboration. This includes working with governments to develop effective legislation and waste management infrastructure, especially in developing countries. Innovation often requires a range of participants along the supply chain to work together, possibly with an official body acting as coordinator. Companies could also support research institutions in their efforts to deepen our understanding of the impacts of plastic in the environment.

An example of identified action is to reduce the weight of plastic used in products and packaging through improved design. Companies could also switch to using recycled plastic and form joint ventures to ensure sufficient supplies. In addition they could investigate the potential of bio-based plastic, although there is much uncertainty about its benefits and impacts. Users of plastic could engage with suppliers on issues such as phasing out hazardous substances.

The research includes several case studies of companies striving to implement good practice on plastic management, including Lush cosmetics, electronics companies Apple, Dell and Hewlett Packard, and soft drink company Coca Cola, as well as awareness-raising initiatives working through innovation to collect and reuse oceans plastic (e.g. Interface and Method).

### KEY RECOMMENDATIONS FOR COMPANIES:

Raise awareness of the risks and opportunities of plastic at executive board level.

Measure plastic use in products, packaging, operations and supply chains and publish the results in annual reports and, for example, through the PDP.

Commit to reducing the environmental impact of plastic and set targets with deadlines to ensure this goal is achieved.

Innovate products and processes to increase resource efficiency and recycling of plastic.

Collaborate with governments to develop legislation to facilitate sustainable management of plastic, such as through extended producer responsibility and waste management infrastructure, especially in developing countries.

Support data collection and further research into the impacts of plastic, especially in the marine environment, in partnership with academic institutions and conservation groups.

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# CONTACT |

## PLASTIC DISCLOSURE PROJECT

T: +852 8197 7378

E: [info@plasticdisclosure.org](mailto:info@plasticdisclosure.org)

[www.plasticdisclosure.org](http://www.plasticdisclosure.org)

## TRUCOST

T: +44 (0) 20 7160 9800

T: +1 800 402 8774

E: [info@trucost.com](mailto:info@trucost.com)

[www.trucost.com](http://www.trucost.com)

## UNEP

Secretariat of the  
Global Programme of Action for the  
Protection of the Marine Environment  
from Land-based Activities (GPA)

E: [gpa@unep.org](mailto:gpa@unep.org)

[www.gpa.unep.org](http://www.gpa.unep.org)

[www.unep.org](http://www.unep.org)

United Nations Environment Programme  
P.O. Box 30552 - 00100 Nairobi, Kenya  
Tel.: +254 20 762 1234  
Fax: +254 20 762 3927  
e-mail: [publications@unep.org](mailto:publications@unep.org)  
[www.unep.org](http://www.unep.org)

