



**United Nations  
Environment  
Programme**



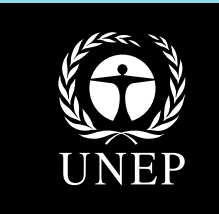
UNEP (DEPI)/RS.16 /WP.4.RS

Original: ENGLISH

16<sup>th</sup> Global Meeting of the Regional Seas  
Conventions and Action Plans  
Athens, Greece 29<sup>th</sup> September – 1<sup>st</sup> October 2014

***Valuing Plastic Publication***

For environmental and economic reasons, this document is printed in a limited number. Delegates are kindly requested to bring their copies to meetings and not to request additional copies



# VALUING PLASTIC

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



Citation: UNEP (2014) Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry.

Copyright © United Nations Environment Programme (UNEP), 2014

This publication may be reproduced in whole or part and in any form for educational or non-profit purposes whatsoever without special permission from the copyright holder, provided that acknowledgement of the source is made.

This publication is a contribution to the Global Partnership on Marine Litter (GPML). UNEP acknowledges the financial contribution of the Ministry of Foreign Affairs, Norway toward the GPML and this publication.



KLIMA- OG MILJØDEPARTEMENTET

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), as Secretariat for the GPML, the Plastic Disclosure Project, its parent organisation Ocean Recovery Alliance, and Trucost have collaborated and co-funded this publication.

**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)

Cover photo © Sablin - iStockphoto

ISBN: 978-92-807-3400-3

Job Number: DEP/1819/NA

Division of Environmental Policy Implementation

## Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations Environment Programme concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the United Nations Environment Programme, nor does citing of trade names or commercial processes constitute endorsement.

Whilst every care has been taken by Trucost in compiling this report, Trucost accepts no liability whatsoever for any loss (including without limitation direct or indirect loss and any loss of profit, data, or economic loss) occasioned to any person nor for any damage, cost, claim or expense arising from any reliance on this report or any of its content (save only to the extent that the same may not be in law excluded). The information in this report does not constitute or form part of any offer, invitation to sell, offer to subscribe for or to purchase any shares or other securities and must not be relied upon in connection with any contract relating to any such matter.



# VALUING PLASTIC

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

## 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.

# CONTENTS |

<b>Message from UNEP</b>	<b>p.7</b>
<b>Message from the Plastic Disclosure Project</b>	<b>p.8</b>
<b>Message from Trucost</b>	<b>p.9</b>
<b>Executive summary</b>	<b>p.10</b>
• Objectives	p.10
• Methodology	p.10
• Findings	p.10
• Recommendations	p.14
<b>Introduction</b>	<b>p.15</b>
• Objectives of the report	p.16
• The environmental and social impacts	p.16
• The business case for managing plastic	p.18
Cutting costs and improving efficiency	p.19
Innovation in products and processes	p.19
Regulation	p.20
Reputation	p.21
Investor interest	p.21
• The concept of natural capital as a tool to assess risks and opportunities	p.22
<b>High-level methodology</b>	<b>p.23</b>
<b>Results</b>	<b>p.26</b>
• Which sectors are the most plastic intensive?	p.26
• What is the magnitude of the natural capital cost?	p.28
• What are the most significant impacts?	p.30
• Where do impacts occur?	p.33
• What is the state of disclosure?	p.35
• What are the natural capital benefits of good plastic management?	p.38
• Summary	p.39
<b>Case study - Raising awareness through innovation: Fishing for litter and the latest uses of ocean plastic</b>	<b>p.41</b>
<b>Roadmap for plastic footprint management</b>	<b>p.43</b>
• Measuring, reporting and monitoring	p.43
• Product and packaging design	p.45
• End-of-life management	p.47
<b>Recommendations</b>	<b>p.48</b>
<b>Glossary</b>	<b>p.51</b>
<b>Acronyms</b>	<b>p.53</b>
<b>Appendix 1: Sector-specific results</b>	<b>p.54</b>
<b>Appendix 2: Types of plastic</b>	<b>p.77</b>
<b>Appendix 3: Methodology</b>	<b>p.78</b>
<b>Appendix 4: Focus on natural capital valuation</b>	<b>p.91</b>
<b>Appendix 5: Company analysis</b>	<b>p.101</b>
<b>References</b>	<b>p.108</b>
<b>Contact information</b>	<b>p.114</b>

# FIGURES AND TABLES |

Figure 1: Total natural capital cost (\$) and percentage of revenue at risk for each sector	p.11
Figure 2: Total natural capital cost of plastic in the ocean (\$) and percentage contribution to total natural capital cost per sector	p.12
Figure 3: Percentage on companies that disclose on at least one data point	p.13
Figure 4: Plastic production per region, 2012	p.15
Figure 5: Business risks and opportunities related to plastic management	p.19
Figure 6: High-level methodology steps	p.23
Figure 7: Plastic intensity per sector (tonnes per \$1m revenue)	p.27
Figure 8: Total natural capital cost (\$) and revenue at risk (natural capital intensity) per sector	p.28
Figure 9: Total natural capital cost (\$) and revenue at risk (natural capital intensity) per sector, normalised by service year	p.29
Figure 10: Upstream and downstream impact distribution	p.30
Figure 11: Plastic-in-packaging natural capital costs compared	p.32
Figure 12: Plastic-in-product natural capital costs compared	p.32
Figure 13: Total natural capital cost of plastic in marine ecosystems (\$)	p.33
Figure 14: Natural capital intensity distribution (\$ per tonne of plastic)	p.34
Figure 15: Distribution Natural capital impacts, by business sector	p.34
Figure 16: Percentage of companies disclosing on at least one data point	p.37
Figure 17: Percentage of companies disclosing on plastic use quantity	p.37
Figure 18: Percentage of companies disclosing on recycled and bio-based content	p.37
Figure 19: Natural capital cost savings due to current recycling and incineration with energy recovery rate	p.38
Figure 20: Natural capital savings due to the use of recycled content	p.39
Figure 21: Natural capital savings from selected Lush's initiatives	p.68
Figure 22: Scope and boundary	p.81
Figure 23: Focus on the environmental impact of different plastic types	p.84
Figure 24: Air pollution valuation	p.93
Figure 25: Impact pathway approach	p.93
Figure 26: Components of the total economic value of water	p.94
Figure 27: Disamenity costs (PPP adjusted) versus percentage of waste collected	p.97
Figure 28: Plastic chemical impacts framework	p.97
Figure 29: Impacts of macro and micro plastic	p.99
Table 1: Sector selection	p.23
Table 2: Plastic intensity per sector (tonnes per \$1m revenue)	p.27
Table 3: Total natural capital cost (\$) and natural capital intensity	p.29
Table 4: Total natural cost per sector split between product and packaging, upstream and downstream	p.31
Table 5: Companies assessed	p.35
Table 6: Disclosure analysis	p.36
Table 7: Types of plastic	p.77
Table 8: Selected sectors for Analysis	p.78
Table 9: Impact inclusion and exclusion	p.82
Table 10: Treatment routes sources and assumptions	p.85
Table 11: Impacts for each end-of-life route	p.86
Table 12: Credits and burdens allocation for each end-of-life route	p.87
Table 13: Valuation methodology summary	p.88
Table 14: Environmental Impacts considered	p.93
Table 15: Percentage of littered product and packaging reaching the ocean	p.96
Table 16: Companies' sector, countries of sales, disclosure and source	p.101

# MESSAGE FROM UNEP |

It is estimated that 10 to 20 million tonnes of plastic is finding its way into the world's oceans each year, costing approximately US\$13 billion per year in environmental damage to marine ecosystems. This includes financial losses incurred by fisheries and tourism as well as time spent cleaning up beaches.

The total natural capital cost of plastic used in the consumer goods industry is estimated to be more than US\$75 billion per year. The cost comes from a range of environmental impacts including those on oceans and the loss of valuable resources when plastic waste is sent to landfill rather than being recycled. The most significant upstream impact is greenhouse gas emissions released from producing plastic feedstock, which is responsible for almost a third of the total natural capital costs.

Oceans are critical to sustaining life's natural support systems. They contribute to the livelihoods, culture and well-being of communities around the world. They also play a vital role in the global economy by providing food and a source of income for millions of people. Yet, with a fast-growing world population, the production of waste continues to increase faster than the efforts to curtail it and prevent it from degrading the environment. More waste means more marine litter; and one of the main types of marine litter is plastic debris.

About 280 million tonnes of plastic is produced globally each year and only a very small percentage is recycled. As society has developed new uses for plastic, the variety and quantity of plastic items found in the environment, and this includes the marine environment, has increased dramatically. Once in the ocean, plastic does not go away: it fragments, eventually breaking down into smaller pieces known as microplastics, and acts as a vector for chemicals such as persistent organic pollutants that may be transferred into the food chain upon ingestion by marine organisms. Transported by ocean currents, few places around the globe have not been infested by this material.

Proper measurement, management and disclosure of information on the use and disposal of plastic will help companies to optimize its use and reduce its end-of-life impacts by fully incorporating environmental management within their business frameworks.

Forward-looking companies can improve their management of plastic by, for example, cutting costs through their more efficient use, developing "closed loop" business models that recover the resources locked up in plastic, and winning customers by creating sustainable products. Good management of plastic could save consumer goods companies up to US\$4 billion per year.

Valuing Plastic: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry is a highly informative publication on the valuation of plastic that allows us, for the first time, to put a figure on the costs companies would incur if the damage caused by waste plastic was included in their accounting. The report highlights the urgent need for businesses to measure, manage and disclose information on their annual use and disposal of plastic, as many companies already do with carbon emissions. It also provides a series of recommendations for companies that are designed to help ensure a sustainable future for plastic.

The report additionally provides companies with guidance on how to achieve the same economic output with fewer inputs and less waste, leading to greater cost savings; all of which can further expand the global economy in years to come.

预览已结束，完整报告链接和二维码如下：

[https://www.yunbaogao.cn/report/index/report?reportId=5\\_12567](https://www.yunbaogao.cn/report/index/report?reportId=5_12567)

