

# Medellin Declaration on Marine Litter in Life Cycle Assessment and Management

Facilitated by the Forum for Sustainability through Life Cycle Innovation (FSLCI) in close cooperation with La Red Iberoamericana de Ciclo de Vida (RICV) on Wednesday 14 of June 2017

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**Abstract** The Medellin Declaration on Marine Litter in Life Cycle Assessment and Management was developed during the Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, which took place from 12–15 June in Medellin, Colombia. The Declaration calls for an improved handling of plastic resources and is meant to encourage researchers and relevant stakeholders to develop new methodologies to address marine litter better within Life Cycle Assessments.

The declaration has been co-authored by various stakeholders present at the conference and has been revised in an online-consultation process until the 18th of July. The global life cycle community is invited to join the Medellin Declaration, which is available for signature on the FSLCI website at: <https://fslci.org/medellindeclaration>.

**Keywords** Declaration · Marine litter · Plastics · Ocean · Marine pollution · LCA · LCIA · Extended producer responsibility

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## 1 Preamble

*The Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica (CILCA) is a bi-annual conference series taking place in different countries in Latin America. CILCA 2017 took place in Medellin, Colombia, from 12–15th of June and focused on the contribution of the life cycle community to the Sustainable Development Goals (SDGs). This has given us the opportunity to focus on analysing relevant aspects of the SDGs for the Latin American and Caribbean Region under the life cycle approach and deepening our understanding, and thus promoting, the generation of new ideas and insights to substantially and effectively contribute to National and Regional Agendas on Sustainable Development.*

## 2 The declaration

The Call for Action ‘Our Ocean, Our Future’ of the Ocean Conference, organised by the United Nations in New York on 5–9 June 2017, calls on all stakeholders to conserve and sustainably use the oceans, seas and marine resources for sustainable development by taking, inter alia, the following actions on an urgent basis, including by building on existing institutions and partnerships: accelerate actions to prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities (including marine debris, plastics and microplastics) and promote waste prevention and minimisation, including through incentivising market-based solutions to reduce waste and its generation, improving mechanisms for environmentally-sound waste management, disposal and recycling and developing alternatives such as reusable or recyclable products, or products biodegradable under natural conditions.

This is especially important, given that our oceans are not only a big source of food, but also provide rainwater, facilitate the transport of goods, and serve for touristic purposes and therefore support the ecosystem services and contribute to the socio-economic environment. In this context, we acknowledge that plastics in the oceans negatively affect not only the marine life and ecosystems overall, they also cause negative impacts on human health for example through the consumption of plastic fragments in seafood. Minimising these impacts is crucial and we believe that in addition to efforts that promote a circular economy approach and are aimed towards more sustainable consumption patterns and lifestyle choices to decrease the dissipation of plastics, life cycle management has the potential to accelerate changes associated with design manufacture, use and end of life management of plastics that will prevent and significantly reduce marine pollution of all kinds, and contribute to socio-economic development.

At the same time, we also acknowledge that currently life cycle assessment (LCA), as one of the most widely used environmental sustainability assessment tools, is not adequately addressing the impacts generated due to marine debris, plastics and microplastics. In addition, we are also not aware of any life cycle assessments on products that include plastics and adequately address the challenge of marine litter. Indeed, there is still an overall need to assess marine ecological impacts in life cycle assessment in a meaningful way (Woods et al. 2016).

Given the magnitude of the impacts caused by marine debris, plastics and microplastics in our oceans and as response to the public concern on these impacts echoed at the recent Ocean Conference, we are calling for:

- a) The generation of science-based data and information to support policy making and implementation of voluntary or mandatory regulations that support the principle of extended producer responsibility and thereby ensure the proper handling of plastics waste at the end of its life.
- b) The support for capacity building on the value of life cycle management for products that contain plastics to accelerate the necessary changes that prevent these plastics to become marine litter.
- c) Technical assistance to target the most vulnerable developing countries with coastal areas, especially the small island developing states such as in the Caribbean, taking into account the regional differences in terms of exposure to waste that is washed ashore, its impact and their capacity to address them.
- d) The development of a typology and nomenclature to define the various particles sizes types, including nanoparticles and other characteristics of plastic pollution, on a number of important categories, such as purposely designed microplastics, waste from textile washing, emissions associated with transoceanic transport and sailing. We also call for a definition of a number of key production processes, as well as the development of an inventory of the risk that plastic ends up into the sea due to inadequately functioning waste and wastewater management systems. This typology should be regionalised by regions or countries, considering the regional differences in waste and wastewater management systems.
- e) The provision of guidance to life cycle assessment practitioners on how to estimate and calculate the fraction of the plastic that may end up in freshwater or marine environments, and in which size distribution.
- f) Losses caused by dissipative uses of materials to be considered in life cycle inventories.
- g) The development of adequate impact assessment models that may support a separate life cycle impact assessment midpoint category for marine litter or be integrated into existing impact categories. A new impact category would then have to contribute to ecosystem damages and loss of human health in endpoint methods. Development efforts could for example build on existing work on fishing nets loss as an additional impact in fisheries' life cycle assessments.
- h) The development of regional characterisation factors in life cycle impact assessment, subdividing the 'ocean' in sub-compartments such as estuarine versus marine environments and considering the over 400 dead zones (Diaz and Rosenberg 2008) in the world, in order to model more adequately the consequences on the respective marine ecosystems.
- i) Life Cycle Assessment case studies of products containing plastics that partially become marine litter to validate the developments foreseen. They could be conducted in cooperation with communities who are actively cleaning the beaches and thus have a good understanding of waste that has been washed ashore.
- j) The consideration of the impacts of marine litter in the development of emerging methods in social life cycle assessment.

Most importantly, we call upon the international donor community to continue to and strengthen their support for the implementation of Goal 12 (<https://sustainabledevelopment.un.org/sdg12>) (responsible consumption and production) and Goal 14 (<https://sustainabledevelopment.un.org/sdg14>) (life below water), in the context of the implementation of the 2030 Agenda for Sustainable Development, in particular by supporting applied research, capacity building and technical assistance on the measures mentioned above. These actions will allow changing our current consumption and production patterns in a way that results in significantly less environmental impacts on the ocean.

With this support, we are committed to creating the science-based tools that will guide and accelerate actions on an urgent basis, including by strengthening existing institutions and partnerships, to develop approaches of assessing marine debris, plastics and microplastics with better inventory data and improved impact assessment methods as an environmental impact category in life cycle assessment. Such a process might also lead to the improvement of existing impact categories through regionalisation of characterisation factors and adding more precise emissions to the ocean sub-compartments. With this insight, we have a basis to further strengthen our efforts to promote extended producer responsibility in order to reduce marine debris, plastics and microplastics in the oceans. We are ready to include the topic in our work to foster sustainable life cycle innovations and to strengthen capacity building and technical assistance on how to promote waste prevention and minimisation by taking a life cycle approach.

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Please note that the declaration has been co-authored by the individuals listed here in personal capacity. Their endorsement does not constitute endorsement by their respective institutions.

**Become a signatory** We invite the global life cycle community and any interested stakeholders to join the Medellin Declaration now. The Declaration is available for co-signature here: <https://fslci.org/medellindeclaration>

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