



# Sustainable Plastic Guide

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# SUMÁRIO

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# 1 | INTRODUCTION

The Rio 2016 Organising Committee for the Olympic and Paralympic Games undertook the commitment of transforming the Olympic and Paralympic Games, with the integration of sustainability criteria throughout the management cycle of the Games, from design and planning to implementation, review and post-event activities.

Sustainability will be achieved through the implementation of three sustainable development principles ratified by the United Nations Conference on Environment and Development (UNCED) - Earth Summit, which are being utilized as a basis for Rio 2016:

- Planet: reduction of the environmental impact caused by the projects related to the Rio 2016 Games, thereby enabling a reduced environmental footprint.
- People: planning and staging of the Rio 2016 Games in an inclusive manner, delivering Games for everyone.
- Prosperity: contribution to the economic development of the state and city of Rio de Janeiro, planning, managing and reporting the projects involved in the Rio 2016 Games, with accountability and transparency.

In this context, the Committee developed the Sustainable Supply Chain Guide that includes environmental, social, ethical and economic aspects present throughout the life of products and services that will be object of procurement processes and licensing cycle, to be integrated in our business practices.

Faced with this principle, the Plastics Guide addresses the materials to be used in tables, chairs and other fixtures in all facilities of the Olympic and Paralympic Games, and informs the suppliers about the good practices related to the material that can be used.

The Guide is divided into three main parts, where the following items will be addressed: the conventional composition of furniture and fixtures; Rio 2016



requirements of more sustainable materials to replace conventional plastics well as recommendations for use of the material in general.

## 2 | BACKGROUND

In recent decades, technology has gradually developed and the manufacture and use of plastics started gradually to occupy a prominent place for various features.

As it is a versatile material, plastic changes many consumption habits. It spread mainly due to economic factors, as it is possible to produce a variety of objects at a relatively low cost and therefore more accessible to the consumer.

Therefore, the plastic has been used increasingly to replace other materials in the manufacture of various objects and today it is widely used, among other applications, in the composition of functional and light furniture and fixtures.

### 3 | COMPOSITION OF PLASTIC FURNITURE AND FIXTURES

Traditionally we can find in the market plastic furniture and fixtures made of:

Polyethylene (PE): thermoplastic or polymer derived from ethylene or ethylene and recyclable. It can be identified in materials through the triangular recycling symbol with a number "4" on the inside and the letters "PE" followed by "LD" (low density) and "HD" (high density).



Polypropylene (PP): thermoplastic or polymer derived from propylene or propylene and recyclable. It can be identified in materials by the triangular recycling symbol with a number "5" inside and the letters "PP".



Polypropylene and polyethylene are examples of thermoplastic polymers, namely, they are composed of resins that become rigid or flexible according to temperature variation. They are high molecular weight substances and are part of the polyolefin group. These are materials with high mechanical resistance, nontoxic and easy to modify to create specific alloys.

However, despite being a material with wide applicability, plastic consumption generates environmental impacts, and some of the reasons are indicated below:

- Plastic is from a non-renewable source of energy, oil;
- Plastic is non-biodegradable material, i.e., it does not degrade easily in the environment and its residue is harmful to the environment. Plastic's degradation time in the environment goes up to 450 years.

#### Requirements on materials that replace conventional plastics

Given the negative impacts of plastic to the environment, Rio 2016 encourages the adoption of alternative materials to replace traditional plastic. Some products from technological innovations are already in place on the market, among them:

- Reused product;
- Recycled plastic;
- Green plastic;
- Timber plastic.

### 3.1 REUSED PRODUCT

Rio 2016 also considers as an alternative to using plastic utensils, the reuse of tables and chairs used in previous Olympic and Paralympic Games events. Products already used and in good condition can be used by Rio 2016. This option helps to minimize the

fact that the demand for new products, result in environmental impacts already mentioned.

### 3.2 RECYCLED PLASTIC

Tables and recycled plastic chairs are also an option to minimize the effect of producing new common plastic articles since the recycled plastic has the same characteristics as conventional plastics.

Its use encourages the promotion of the dynamics and movement of business focused on recycling plastics, which also reduces the demand for more raw materials. It also results in decreasing the volume of post-used waste material that is sent to landfills or most often arranged irregularly in nature.

### 3.3 GREEN PLASTIC

Green plastic is a thermoplastic resin produced from ethanol cane sugar. The material has the same technical properties of conventional polyethylene such as appearance and variability of applications in use. Because it is a product derived from renewable sources, it helps reducing the greenhouse gas emission from the lifecycle of the product. It is thus characterized as being a more sustainable plastic.

Currently, the green plastic on the market may have different renewable content in accordance with its formulation and implementation. Rio 2016 values the plastic with the highest percentage of renewable content, because it will be less dependent on their production source of non-renewable resources such as oil.

### 3.4 WOOD PLASTIC

The plastic timber has the same functionality as the conventional wood, and can be used in the construction of furniture, doors and windows among other products. It also has an impermeable surface, and ease of cleaning.

The plastic timber can be composed of wood waste and / or sawdust with plastic waste, which gives the timber alloy. The plastic used can be from PET bottles, plastic bags



and packaging in general. The material therefore does not require forest clearing to provide raw material.

The plastic timber does not require pesticides in its lifetime, which favors greater durability.

### 3.5 USE OF PLASTIC MATERIAL - APPROPRIATE DESTINATION

For proper disposal of the material after the Olympic and Paralympic Games, Rio 2016 expects its suppliers to promote and guarantee the following actions:

- The reuse of furniture and plastic utensils to new customers demands and / or;
- Donation to NGOs (Non-Governmental Organizations) and other institutions that may use the products in their operation;
- The recycling of plastic material. Besides the direct sale to recycling plants, there is a possibility to interact with companies in the Brazilian market that act as intermediaries between sellers of waste and those interested in buying them for recycling (plastics, rubber, ferrous and nonferrous metals, glass, etc.).

### 3.6 LIFE CYCLE OF PLASTIC FURNITURE AND FIXTURES

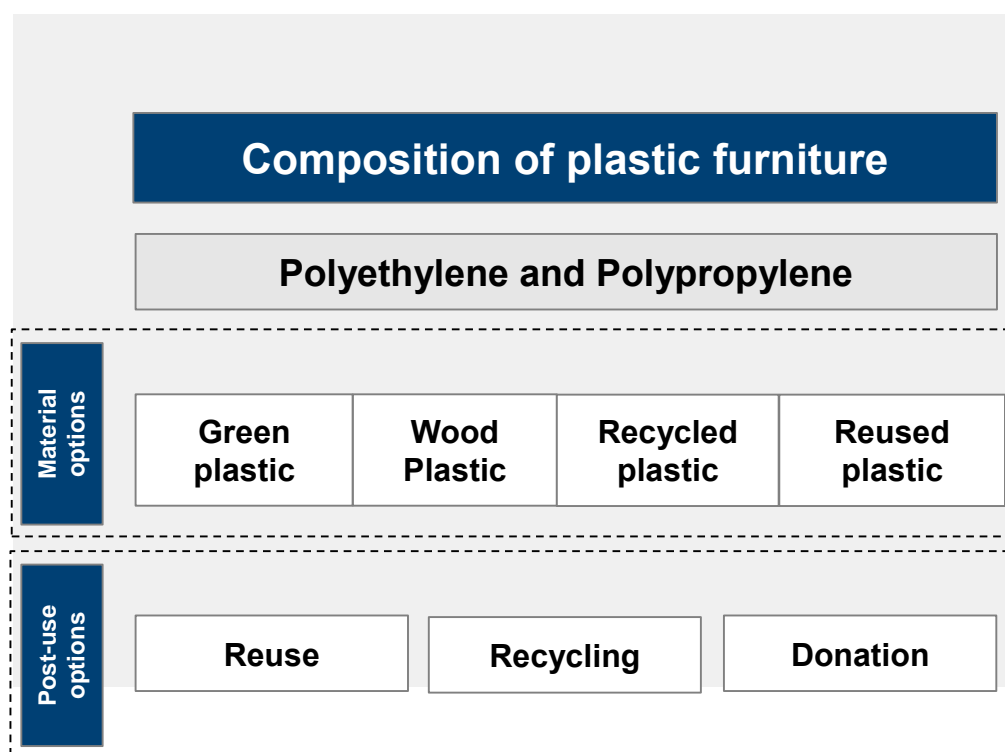
The life cycle consists of monitoring all stages of the production process and the use of a particular product, going from the extraction of raw materials to their final destination at the post consumption. This review identifies the main positive and negative impacts involved with the manufacture and use of the product, such as the natural resources consumed, pollutants waste generated, the influence on the life of the surrounding community of the production plant, etc.

Following the logic of the life cycle, further light is shed on the key impacts generated by plastic, as mentioned earlier in this manual. Below is a table with a general statement of the main features of this product.

PLASTIC TYPE	SOURCE	STAGE OF LIFE	OVERALL IMPACTS OF PLASTIC	POST USE
Polyethylene Polypropylene	Oil (nonrenewable)  Ethanol (renewable source)	Oil Extraction and refining	Consumption of non-renewable natural resource, Contamination of soil and water through leaks, Generation of contaminated waste and emission of gases causing the greenhouse effect.	Disposal options:  Incineration Landfill Recycling Reuse, Dump in nature or indirectly (in these cases, the material is highly contaminating)
		Petrochemical / plastic manufacturing	Generation of liquid effluents and gaseous pollutants and greenhouse gas Solid waste generation	
		Transport / Logistics for use	Indirect (vehicle manufacturing) and direct spending of natural resources for consumption (gasoline, diesel oil, grease etc) emission of Greenhouse gases due to the burning of fossil fuels	
		Consumption	Generation waste in large volume with a long decomposition time that, when poorly designed, contaminate water and soil.	

### 3.7 SUMMARY OF THE PRESENTED CONTEXT OF PLASTIC

Briefly, the recommendations on good sustainability practices to be considered by the supplier market in the category of plastics are shown in the diagram below:



## 4 | FINAL CONSIDERATIONS

Rio 2016 wants to the market to evolve in order to meet its procurement demands pursuant to its sustainability guidelines, which promote the reduction of impacts and environmental restoration, development and recognition of people, as well as conservation and prosperity of the business.

Rio 2016 believes that it is extremely important that the Brazilian supplier market be prepared to such challenges, enabling:

- development and leverage to the Brazilian economy,
- promotion of local labour capacity and qualification
- reduction of demands which include imports of products that are characterized by: complex logistics, higher emissions of greenhouse gases, difficult tracking of social and environmental practices of the place of origin

Finally, taking into account the sustainable practices of its suppliers, both in its operation and in the destination of products sold in the post-use of the Olympic and Paralympic Games, Rio 2016 aims to have a relationship with and monitor its supply chains so as to encourage and stimulate good market practices as part of its Olympic and Paralympic legacy.

## 5 | REFERENCE GUIDES

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