TOWARDS A SOLUTION

It is not the plastic itself the environmental problem, but the use it makes of it!

It is essential to prevent waste, focusing on systems of circular economy, capable of combating climate change, reducing dependence on fossil fuels and respecting the balance of the environment.

In all countries, plastic pollution is the result of failures in its overall life cycle: from production to consumption, from waste management to secondary markets for recycling. Change requires strong **public and private investment**, and even if some solutions and practices are already available, they will need to be shared and expanded to maximise their impact. **The participation and mobilization of all is crucial:** governments, industry and citizens must assume their responsibilities and work together to build an efficient circular economy model in which plastic is not necessarily avoided, but stop becoming a waste.

The good news is that all over the world things are already starting to change!

RESEARCH AND DEVELOPMENT | INFRASTRUCTURES | CHANGE OF VALUES | INFORMATION AND EDUCATION | INVESTMENT

OBJECTIVES

- LOWER PRODUCTION
- INCREASE THE SHARE OF RECYCLING
- MODIFY CONSUMER HABITS
- INNOVATING! (PRODUCTS AND SERVICES)

ALL ARE INVOLVED: SCIENTIFIC COMMUNITY, POLICY MAKERS, CIVIL SOCIETY, BUSINESS, CITIZENS, SCHOOLS, ETC.

POLICIES

In a few years, dozens of countries around the world have adopted **policies to reduce the use of disposable plastic**. The co**mmitment of the United Nations** has certainly contributed to this change of course, which has made the fight against disposable plastic one of its priorities from 2018.

PLASTIC BAG pictures 127 countries have adopted laws to regulate the use of plastic bags

PLASTIC BOTTLE pictures 27 countries have enacted laws that prohibit some products, materials or production processes

Notes and PEN pictures 27 countries have set taxes on the production of plastic bags

MONEY (coins) pictures 30 countries charge consumers fees for the use of plastic bags

PLASTIC BOTTLES pictures 63 countries have taken measures to greater responsibility on the part of producers

PLASTIC in the SEA pictures 8 countries have banned microplastics with national laws

Africa is the continent with the largest number of states (25 to 2019) that have adopted a total ban of production and use of plastic bags.

In Europe, an important directive came into force on 3 July 2019 to tackle the problem of disposable plastic, which states have two years to transpose. The arrangement is the result of the **"European Strategy for Plastic in a Circular Economy",** the first strategic document that provides guidelines on how to transform, in a circular economy perspective, the entire plastic supply chain.
The European directive is ambitious and introduces some important elements also from a conceptual point of view, such as **greater responsibility on the part of producers** for the costs of waste removal. Are also **banned some disposable plastic products** for which there are alternatives on the market: cotton swabs, cutlery, plates, straws, mixers for drinks, rods for balloons, but also cups, food and beverage containers made of expanded polystyrene and all products made of oxodegradabile plastic. Specific targets for plastic bottles are set: the separate collection of plastic bottles by 90% by 2029 (77% by 2025), the introduction of design requirements to ensure that caps remain attached to bottles, the obligation to integrate increasing percentages of recycled plastic into new bottles. There are also communication campaigns, measures to reduce the consumption of plastic food containers and beverage cups and **mandatory labelling** for products such as cigarette filters, plastic cups, sanitary towels and wet wipes, to inform consumers about the negative impacts in case of abandonment in the environment and to give an indication on the correct disposal.

FOCUS: DO YOU KNOW WHAT THE TARGETS OF SDG 14 ARE?

In the Sustainable Development Goals plastic is not explicitly mentioned, but the first of the goals of the SDG 14 aims at the prevention and reduction of all forms of marine pollution, with particular reference to the one related to terrestrial activities: Among these, plastic, as we have seen, has a leading role. Of course, plastic is not the only problem for underwater life. In order to *"Preserve and make sustainable use of the oceans, seas and marine resources for sustainable development"*, the 2030 Agenda under Objective 14 aims to achieve the following targets:

- **14.1** - By 2025, **to prevent and significantly reduce all forms of marine pollution**, especially from activities on land, including pollution of marine debris and nutrients.
- **14.2** - By 2020, **sustainably manage and protect the marine and coastal ecosystem** to avoid particularly negative impacts, including strengthening their resilience, and take action to restore them so as to achieve healthy and productive oceans.
- **14.3** - Minimize and addr**ess the effects of ocean acidification**, including through increased scientific collaboration at all levels.
- **14.4** - By 2020, **effectively regulate fishing** and end overfishing, illegal, unreported and unregulated and destructive fishing methods. Implement management plans on a scientific basis, so as to restore fish stocks in the shortest possible time, bringing them at least to levels that produce the maximum sustainable yield, as determined by their biological characteristics.
- **14.5** - By 2020, **preserve at least 10% of coastal and marine areas**, in accordance with national and international law and based on the most accurate available scientific information.
- **14.6** - By 2020, **ban those forms of fishing subsidies that contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing** and refrain from reintroducing such subsidies, recognising that special and differential treatment for developing and least developed countries, which is appropriate and effective, should be an integral part of the World Trade Organisation's fisheries subsidies negotiations.
- **14.7** - By 2030, **increase the economic benefits of small island developing states** and less developed countries, using more sustainable use of marine resources, including **sustainable management of fisheries**, aquaculture and tourism.
- **14.a** - **Increase scientific knowledge, develop research and transmission capacity of marine technology**, taking into account the criteria and guidelines of the Intergovernmental Oceanographic Commission on the Transfer of Marine Technology, with the aim of improving ocean health and increasing the contribution of marine biodiversity to the development of emerging countries, especially small island developing countries and less developed countries.
- **14.b** - Providing **access to marine resources and markets for small-scale artisanal fishermen**.
- **14.c** - **Enhancing the conservation and sustainable use of the oceans and their resources by applying international law**, as laid down in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of the oceans and their resources, as reported in paragraph 158 of *"The future we want"*.

AND ITALY?

Italy has already implemented some policies for the reduction of the use of plastic:

- Plastic bags were banned in 2013 and in 2018 plastic bags were also eliminated for the purchase of fruit and vegetables in supermarkets.
- In 2019, anticipating the European directive, plastic cotton-buds were banned and, in October, the Chamber passed the law *"save the sea"*, to allow fishermen to bring the plastic accidentally finished in nets or in any case found offshore.
- From 2020 cosmetic products containing micro-plastics were also banned.

Italy, in the Mediterranean, is also a leader in plastic recycling, with 1 million tons of waste sent for recycling every year. Interesting Italian feature is also the great commitment that many municipalities dedicate independently to the fight against disposable plastic. At the beginning of 2019, for example, there were over 60 "virtuous municipalities" that, in one way or another, committed themselves to reducing the consumption of plastic on their territory.
Of course there is a lot to do in Italy and in the world. Among the priorities are the following:

- The introduction of new prohibitions for plastic articles, at least fulfilling all the requirements of the European directive.
- Support to municipalities for the elimination of deficiencies in waste management.
- The increase in recycling rates, particularly in some regions.
- The expansion of the market of secondary materials.

AND LEBANON?

In Lebanon, unfortunately due to the current socio-economic situation in place since 2019, there are still no legislative initiatives to reduce the consumption and use of plastic.
Only a few virtuous municipalities proposed in 2018 (Jbeil, Batloun el-Shouf, etc.) a ban on the use of plastic bags but little else was done about it.
Even some supermarket chains had promised a ban or payment by the consumer for every single plastic bag used but in reality it never entered into practice.
We rely only on the common sense of every citizen trying to shop with tote-bags and reduce as much as possible straws, plastic bottles, etc.

MARINE PROTECTED AREAS (MPA)

One of the most effective means of conservation of marine habitats is undoubtedly protected areas: the creation of effective and equally managed protection systems should be systematically pursued by the governments of each coastal State.

With over 7,500 kilometres of coastline, **Italy and its sea are a precious element not only from the strictly environmental point of view, but also for important economic activities such as tourism and fishing** (Lebanon, 255 Km of coastline). The Marine Protected Areas are the instrument that the *Ministry of the Environment and the protection of the Territory and the Sea* has to protect and conserve the seabed and the coasts. Protected areas encourage and promote research, sustainable tourism and enhance places of national interest by helping **to maintain and preserve essential ecological processes, protect biodiversity and ensure sustainable use of**

resources. The presence of MPA ensures the monitoring of species and habitats, helps to minimize the environmental impact of recreational boating and promotes an increase in the availability of fish resources, with benefits that go far beyond their borders.

To date, **27 marine protected areas** have been established in Italy: 24 marine areas, 2 submerged parks and an international Sanctuary for the protection of cetaceans, to which are added 2 national parks with sea perimeter. **The extent of the seabed and protected waters is almost 3,000,000 hectares.**
The first to be established, in 1986, was the **Marine Park of Miramare**, in the Gulf of Trieste, followed, in 1999, by the marine protected area of the Portofino Promontory in Liguria.

In Lebanon, there are two legally declared marine protected areas: **The Palm Islands Nature Reserve** in North **Lebanon** and the **Tyre Coast Nature** Reserve in South Lebanon.

In the Italian and Lebanese marine protected areas are not allowed all activities that may compromise the protection of the environmental characteristics subject to protection. In particular, within each area are identified three areas with different degrees of protection, based on the conservation needs of the area itself.

- **Zone A**, an integral reserve, where all activities that may cause damage or disturbance to the marine environment are prohibited. It is the heart of the reserve, where protection is maximum, to ensure the
- protection of animal and plant species, and ensure their reproduction. It is bordered by buoys in the sea and light poles on the ground.

- **Zone B**, generally borders with zone A and is a buffer area, where the regulation of the managing body is less binding, you can for example dive, bathing, guided tours and transit, mooring and anchoring on special buoys. Small-scale and non-invasive fishing is permitted here.

- **Zone C**, which serves to ensure a gradual approach to the most protected areas, where the transit of motor boats at reduced speed and sport fishing are also allowed.

COMPANIES

2018 was a turning point in the world of large companies that produce and use plastic packaging. Public pressure, media attention and the campaigns of many associations on the problem of plastic pollution gave their first fruits.
This is the year of the *"New Global Plastics Economy Global Commitment"*, an initiative carried out by the Ellen MacArthur Foundation in collaboration with the United Nations Environment Programme (UNEP). It is a global commitment to a new plastic economy that unites businesses, governments, and organizations that share a vision and objectives to address the problem.

The signatories:

- **Almost 200 companies** that are part of the value chain of plastic packaging, which together account for **over 20% of all plastic packaging** used globally.
- 16 governments on five continents.
- 26 financial institutions with a combined asset of 4.2 trillion dollars of assets managed and 6 investors.
- Major institutions and associations such as the WWF, the World Economic Forum, the Consumer Goods Forum and the IUCN (International Union for Nature Conservation).
- More than 50 academics, universities and other educational organizations.

The signatory companies, in addition to having approved the common vision of a circular economy for plastics described in the document, commit themselves to a series of **ambitious targets for 2025**, which they must review upwards and report every 18 months. The objectives introduced are divided into three pillars:

1. **Eliminate** all problematic and non-essential plastic packaging by switching from disposable to reusable packaging models.
2. **Innovate** to ensure that all plastic packaging can be safely reused, recycled or composted by 2025.
3. **Circular plastics**, significantly increasing the amount of material reused or regenerated in new plastic products.

WILL IT BE GREEN WASHING?

There is, of course, a risk of vague and insufficient commitments, geared only to improving the image. It will only be with time that it will be possible to assess whether the declarations will turn into the **real paradigm shift in the design**, production and end-of-life management of packaging that is needed.
But **accelerating the transition to the circular economy is only possible if the consumer goods industry takes responsibility for providing new solutions** by investing in technology, innovation and materials. And the public commitment that many large companies have made by adhering to the *"New Global Plastics Economy Global Commitment"* is definitely an important step in this direction.

THE ROLE OF EACH OF US

Why are companies and governments suddenly so active in countering the plastic emergency? A very important role is played by the **increasing attention of people to environmental issues**. Also thanks to the global movement of young activists led by Greta Thumberg, who has found fertile ground to grow and take root all over the world, this attention continues to grow.

DID YOU KNOW THAT?

WHO IS GRETA THUNBERG

Greta Thunberg is a teenager, born in Stockholm in 2003, and is the most famous activist for sustainable development and against climate change in the world. At the age of 16, she spoke at numerous conferences, the United Nations and beyond; she was portrayed on the covers of newspapers around the world and met important leaders, politicians, turning the spotlight on the current global climate crisis. It all started on August 20, 2018, when Greta decided not to go to school until the elections, scheduled for the beginning of September, and instead sit in front of the parliament of her country with a sign written **"School strike for climate"**. She wanted the Swedish government to reduce carbon dioxide emissions as required by the Paris agreement on climate change. A few days before the elections Greta announced that the strikes would continue every Friday: thus was born **Friday For Future**, a movement that within a few months has become planetary in scope, with global demonstrations held periodically and which led to the mobilization of citizens of all ages in almost 1700 cities of 125 countries. In Italy alone, about 1 million people in 180 cities participated in the third global climate strike on Friday 27 September 2019.

More sensitive and demanding citizens mean **voters and consumers with the power to influence the decisions** of governments and businesses towards more sustainable choices.
Even at the local and individual levels, everyone can make choices respectful of the ocean: **small changes in daily life**, if carried out with constancy by the community, lead to effective transformations.
In changing one's habits with a view to reducing plastic consumption, it is important to remember that the approach to be adopted is that of **converting to a circular economy model**, which avoids as much as possible any formula of "disposable" whatever material it is.

Finally, it is important to remember that the **awareness and collaboration of all the actors involved is a key element**: citizens, tourists, businesses, tourism operators, local and regional authorities must pursue the common objective of putting into practice virtuous behaviours, good community practices, territorial laboratories, regulations and synergistic actions and coordinate for the reduction of plastic waste and the zeroing of their dispersion in the environment.

FOCUS: IT'S EASY TO BECOME PLASTIC LESS!

Some concrete examples of sustainable behaviour to put into practice immediately:

- Committed to making **a proper and careful separate collection**, reducing waste sent to landfill we also reduce marine litter.
- **Nothing should be thrown in the toilet!** Cotton-buds, medicine blisters, tampons, applicators, contact lenses... What goes to the toilet ends in nature.
- **Get out of the disposable logic**. The water bottle and reusable shopping bags are the most classic examples, but you can choose sustainable alternatives in many areas of your life. For example, you may prefer a razor that can be used for life and leave the plastic ones, try reusable make-up pads or give up wet wipes.
- **Avoid any form of packaging where possible:** from soaps, which can be solid, to shopping, where you can prefer bulk products or with reduced packaging and recyclable material.
- Always look **at what the products you buy are made of**, from clothes to cosmetics.
- Stop smoking, it's good for you and the environment. But if you smoke, **always throw the butts in the trash**, otherwise sooner or later they will reach the sea.
- Avoid throwing waste in bins or baskets **that do not have a lid**: the wind could take them away and disperse them.
- **Activate!** Join your City Council to find out what's being done, join an environmental association and talk to your friends about the things you've learned.

FOCUS: SMALL ARMIES TO FIGHT THE BIG PLASTIC PROBLEM!

Bacteria, enzymes and even caterpillars eat plastic! These are the protagonists of the latest discoveries, sometimes made by chance as in the best traditions of science.
An example is that of a caterpillar commonly used as bait by fishermen, whose predilection for plastic was accidentally discovered by an **Italian biologist, Federica Bertocchini**. It is a wax moth *(Galleria mellonella)* that can eat and degrade polyethylene. The greater wax moth is a moth (a genus of butterfly) that parasites the hives feeding on beeswax. Dr Bertocchini, a researcher at the Spanish Institute of Biomedicine and Biotechnology of Cantabria (CSIC) and **a passionate beekeeper**, realizing that her hives were infested with this parasite, had started to clean them up, **temporarily depositing the caterpillars inside a plastic bag.**

To her surprise she noticed that the cate**rpillars had managed to get rid of it** by devouring the plastic of which the wrapper was composed. But perhaps the discovery would not have had the same fate if it had not been a curious person: the researcher immediately got in touch with the **Department of Biochemistry of the Cambridge University**, planning an experiment. A hundred larvae of *Galleria mellonella* were then placed near a plastic bag and, after 12 hours, the mass of the envelope was reduced by 92 milligrams: a rate of degradation that the researchers judged extremely rapid. Other micro-organisms capable of digesting plastic, such as some bacteria, can in fact devour a maximum of 0.13 milligrams in a day. Research has shown that the digestion of the plastic is not only due to the simple chewing action of the worm, but due to a chemical process catalysed by an (not yet known) enzyme.

Much smaller, but equally hungry for plastic, appear to be some naturally occurring microbial communities in the seas, which accumulate on plastic and contribute to its degradation, through a natural biological mechanism facilitated by a number of external factors, including solar radiation, temperature changes and abrasion caused by seawater. Under normal conditions these processes take place in very long times. **However, a group of scientists in the UK have improved the performance of a plastic-eating bacterium by modifying its digestive enzyme.**
The original version of the enzyme, called PET-asi and naturally produced by the bacterium *Ideonella sakaiensis*, has been altered in a controlled way thanks to a tool that produces X-rays 10 billion times more intense than those of the sun, achieving an improvement in degradation capacity of about 20%.

SOURCES AND INSIGHTS

Complete text of plastics-strategy-brochure.pdf (europa.eu) (English)

Guide and Blog for a Plastic-free life https://myplasticfreelife.com/plasticfreeguide/ (English)

Companies working with Ellen McArthur Foudation to reduce plastic New Plastics Economy (English)

Discover the Protected Areas of Lebanon https://www.protectedplanet.net/country/LBN (English)

Some environmental and/or Recycling NGOs or Companies in Lebanon:

https://recyclelebanon.org/

https://www.facebook.com/arcenciel.org/

https://www.facebook.com/TerreLiban/

https://www.facebook.com/zerowasteact/

https://liveloverecycle.tilda.ws/

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