Water and Environment Support
in the ENI Southern Neighbourhood region

Activity: WES N-E-DZ-1

Workshop on marine litter monitoring & mitigation

Busting the myths and misconceptions related to marine litter solutions

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LDK CONSULTANTS S.A.

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MYTHS & MISCONCEPTIONS ALONG THE MANAGEMENT CYCLE OF MARINE LITTER

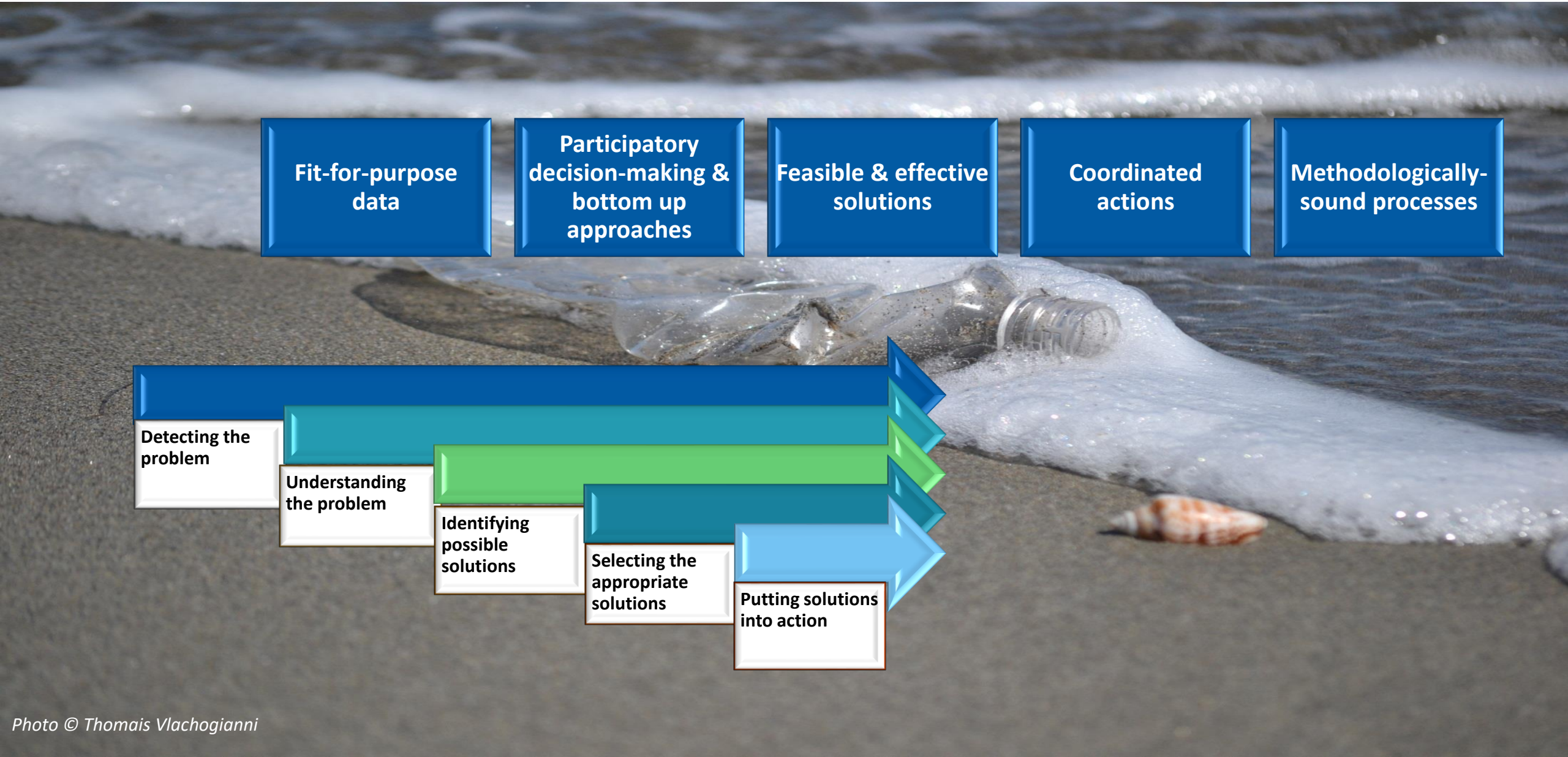


Photo © Thomais Vlachogianni

WISE USE OF PLASTICS WITHIN A CIRCULAR ECONOMY

Source → Manufacture → Distribute → Consume → Waste

THE RECYCLING OF PLASTICS | LIMITATIONS & COMPLICATIONS

- The complexity of plastic recycling brings high costs associated with infrastructure and processing. In addition, the quality of plastic degrades during recycling and may contain contaminants that can compromise the integrity and safety of recycled products.
- Extended Producer Responsibility schemes can result in design changes that enable the effective and efficient recycling of product waste.
- Mandatory use of recycled content in plastic products increases the demand for recycled.

CAN MARINE PLASTICS BE RECYCLED?

WHAT ARE PLASTIC ITEMS MADE OF?

Thermoplastics

capable of being repeatedly moulded, or deformed plastically, when heated

Polyethylene Terephthalate (PET); Polypropylene (PE); Low Density Polyethylene (LDPE); High Density Polyethylene (HDPE); Polystyrene (PS); Expanded Polystyrene (EPS); Polyvinyl-chloride (PVC); Polycarbonate; Polypropylene (PP); Polylactic acid (PLA); Polyhydroxyalkanoates (PHA)

Thermosets

once formed, cannot be remoulded by melting

Polyurethane (PUR), Phenolic resins, Epoxy resins, Silicone, Vinyl ester, Acrylic resins, Urea-formaldehyde (UF) resins

Polymer	Plastic product
HDPE	Milk bottles, freezer bags, shampoo bottles, ice cream containers
PET	Bottles for water and other drinks, dispensing containers for cleaning fluids, biscuit trays
LDPE	Bags, trays, containers, food packaging film
PP	Microwave dishes, potato chip bags, bottle caps
PS	Cutlery, plates and cups
EPS	Hot drink cups, insulated food packaging, protective packaging for fragile items

BIO-BASED VS PETRO-BASED PLASTICS

Bio-based plastics

made from renewable resources

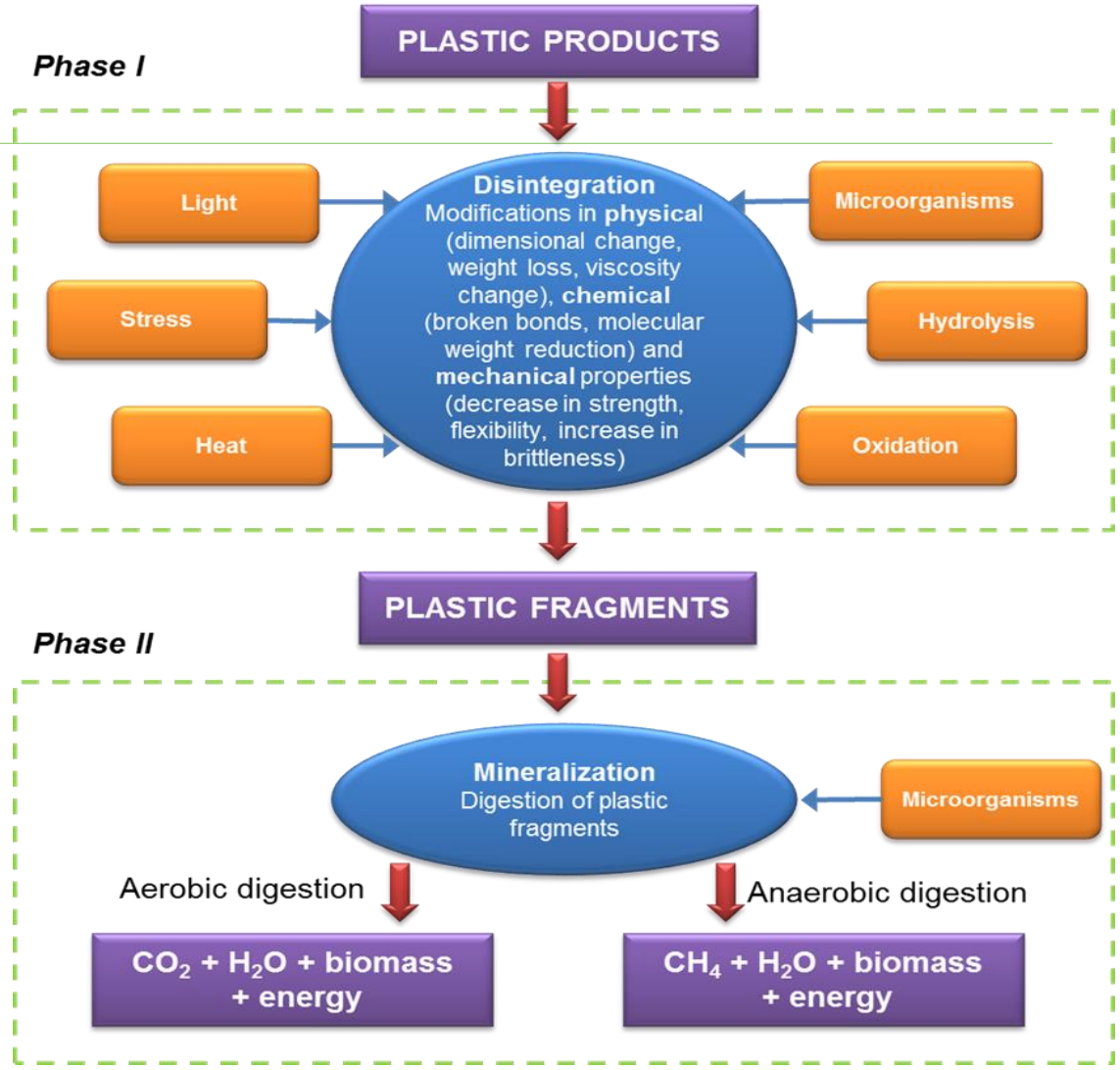
Petro-based plastics

made from non-renewable petroleum based resources

- Renewable resources can include corn, potatoes, rice, soy, sugarcane, wheat, and vegetable oil.
- Two very common examples of bio-based plastics are bio-polyethylene and poly(lactide). While most of the conventional polyethylenes are produced from fossil fuel, bio-polyethylene a leading bio-based plastic is produced entirely from biomass feedstock.

DEGRADATION OF PLASTICS

- The degradation of plastics is defined as the process that induces changes in the polymer properties (deterioration of functionality) due to chemical, physical or biological reactions.
- Depending upon the nature of the causing agents, polymer degradations have been classified as thermal- (heat), photo- (sunlight), oxidative- (oxygen), hydrolytic- (water), mechanical- (stress), and bio- (microorganisms) degradation.



DEBUNKING THE MYTHS & MISCONCEPTIONS ABOUT MARINE LITTER PREVENTION & MITIGATION ACTIONS

Substituting 'conventional' plastics with biobased plastics is merely a distraction to the marine litter issue.

End-of-pipe solutions such as cleanup operations cannot address the issue.

Biodegradable and compostable plastics pollute our coasts and seas just like conventional plastics, as they behave quite differently in the marine environment than in a terrestrial setting (landfill, composter) where the conditions required for rapid biodegradation are unlikely to occur. In addition, mixing of such plastics with normal plastics in the recycling stream may compromise the properties of the newly synthesised polymer.

PHOTOGRAPH BY JUSTIN HOFMAN

EC GUIDELINES ON SINGLE-USE PLASTIC PRODUCTS

‘Plastics manufactured with modified natural polymers, or plastics manufactured from bio-based, fossil or synthetic starting substances are not naturally occurring and should therefore be addressed by the SUPs Directive. The adapted definition of plastics should therefore cover polymer-based rubber items and bio-based and biodegradable plastics regardless of whether they are derived from biomass or are intended to biodegrade over time’

Commission guidelines on single-use plastic products in accordance with Directive (EU) 2019/904 of the European Parliament and of the Council on the reduction of the impact of certain plastic products on the environment *(2021/C 216/01)*

CAN CHEMICAL ‘RECYCLING’ SOLVE THE PLASTIC POLLUTION CRISIS?

energy-intensive

produces greenhouse gas emissions

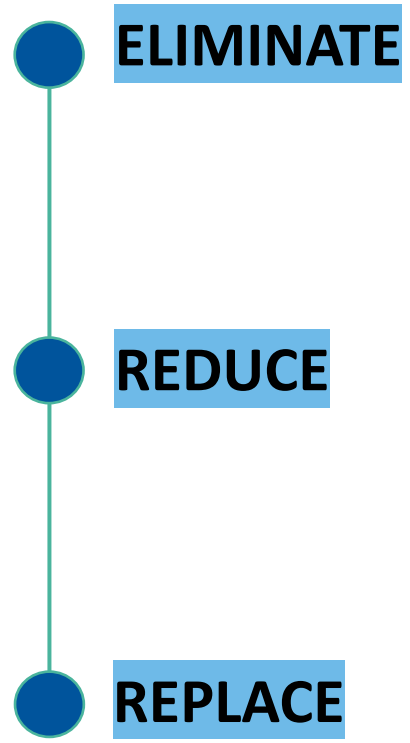
requires/emits chemicals

logistical & economic issues related to collection and sorting

The related technology is still largely in the research and development phase.

THE EUROPEAN WASTE HIERARCHY AT THE HEART OF MARINE LITTER PREVENTION & MITIGATION INTERVENTIONS

Phase out or eliminate	This option refers to the absolute removal of a plastic item from a business, i.e. no bottled water is given to customers.
Reuse	This option refers to deploying a reusable alternative, i.e. by joining a reusable coffee-to-go cup scheme.
Reduce	This option refers to the reduction of the use of plastic items, i.e. by providing it to a customer only when requested (handing out a carrier bag only upon request).
Replace with a sustainable or more sustainable alternative	This option refers to replacing a plastic item in use with a less harmful alternative i.e. replacing a plastic straw with a 'straw' straw or replacing a plastic cup with a FSC non-plastic-coated paper cup.
Improve recycling	This option refers to ensuring that a plastic item that is necessary due to a regulation or due to the unavailability of alternatives, is fully recyclable, is appropriately collected and recycled.



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Thank you for your attention!

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