



WWF

REPORT

2019

STOP THE PLASTIC FLOOD

A guide for policy-makers in Italy



ITALY

EXECUTIVE SUMMARY

ITALY'S PLASTIC VALUE CHAIN LEADS TO 0.45 MT OF PLASTIC WASTE LEAKED INTO NATURE EACH YEAR.

Italy is the largest producer of plastic goods and the second largest waste generator in the region. Italians generate almost 4 MT of waste each year, over 80% of which comes from the packaging industry. Tourism is a key factor in this waste generation, increasing waste by over 30% in summer months. Due to challenges in waste management capacity in certain regions and hotspots, 13% of the waste stream goes uncollected, which leads to 0.45MT of plastic littered and leaked into nature. Of the waste collected, 26% is recycled and re used as secondary material, while 60% of all waste undergoes landfilling and incineration.

ITALY HAS ONE OF THE LONGEST COASTLINES IN THE MEDITERRANEAN, AND SUFFERS EXPERIENCES SOME OF THE WORST IMPACTS OF PLASTIC POLLUTION.

53kT leaked into the Mediterranean in 2016, and thus some of the highest concentrations of plastic waste in the sea are near Italian coasts. Italy's 'Blue Economy', 3rd largest in Europe, loses an estimated €67M to plastic pollution each year.

ITALY'S PRIORITIES TO REDUCE PLASTIC POLLUTION ARE FURTHER REDUCING CONSUMPTION, TACKLING KEY WASTE MANAGEMENT GAPS AND CONTINUING TO GROW RECYCLING.

Italy has already implemented some pioneering policies to reduce plastic use and collect sorted waste, including bans on micro plastics, an effective four stream waste collection system and eco modulated producer contributions to encourage upstream innovation. Italy is also the regional leader in recycling, with 1MT of plastic packaging waste recycled each year. Italy can expand these initiatives to truly become a leader in reduction, innovation and recycling. Italy's priorities are around implementing additional single use plastic bans, within and beyond the EU single use plastics directive and supporting municipalities to urgently eliminate uncollected waste and mismanagement. Finally, Italy can grow its recycling industry even further, by setting more ambitious targets and improving the economics of secondary markets.

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Front cover

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1. MAPPING THE LIFECYCLE OF PLASTIC IN ITALY

- Value chain analysis of plastics’ lifecycle from production to waste management
- Evaluation of the main sources of plastic leakage into Nature

2. UNDERSTANDING THE IMPACT OF PLASTIC IN ITALY

- Overview of the impact of plastic on the country’s environment and economy
- Spotlight on the top Mediterranean hotspots

3. EVALUATING THE POLICY LANDSCAPE REGARDING PLASTIC IN ITALY

- Review of the existing policy landscape and initiatives to curb plastic pollution
- Roadmap to recommended future interventions

ANNEX

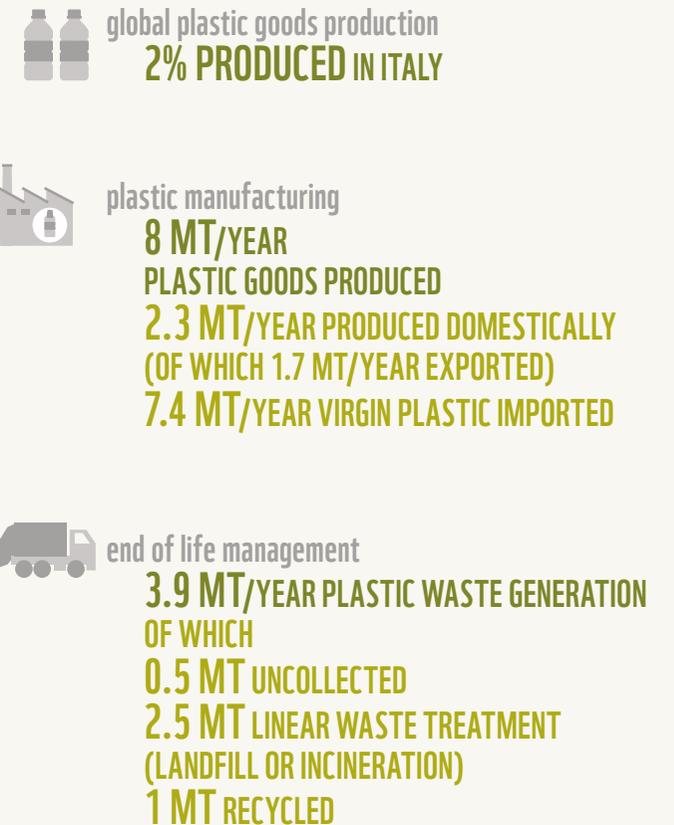
- The plastics value chain and stakeholders
- Glossary
- Methodology Overview
- Plastic waste system activities causing controlled and mismanaged waste

ITALY
OVERVIEW

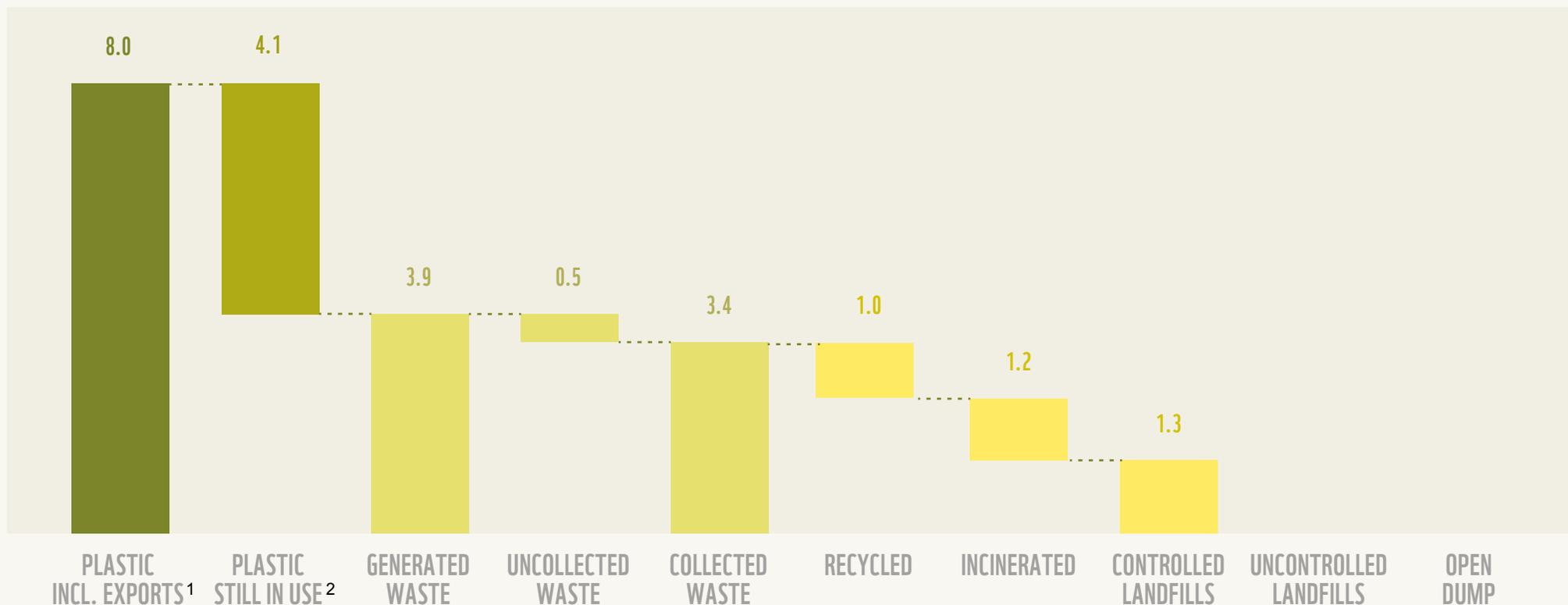
ITALY IS THE LARGEST PRODUCER OF PLASTIC GOODS AND THE 2nd LARGEST WASTE GENERATOR IN THE REGION



Plastic footprint overview:



PLASTIC LIFECYCLE

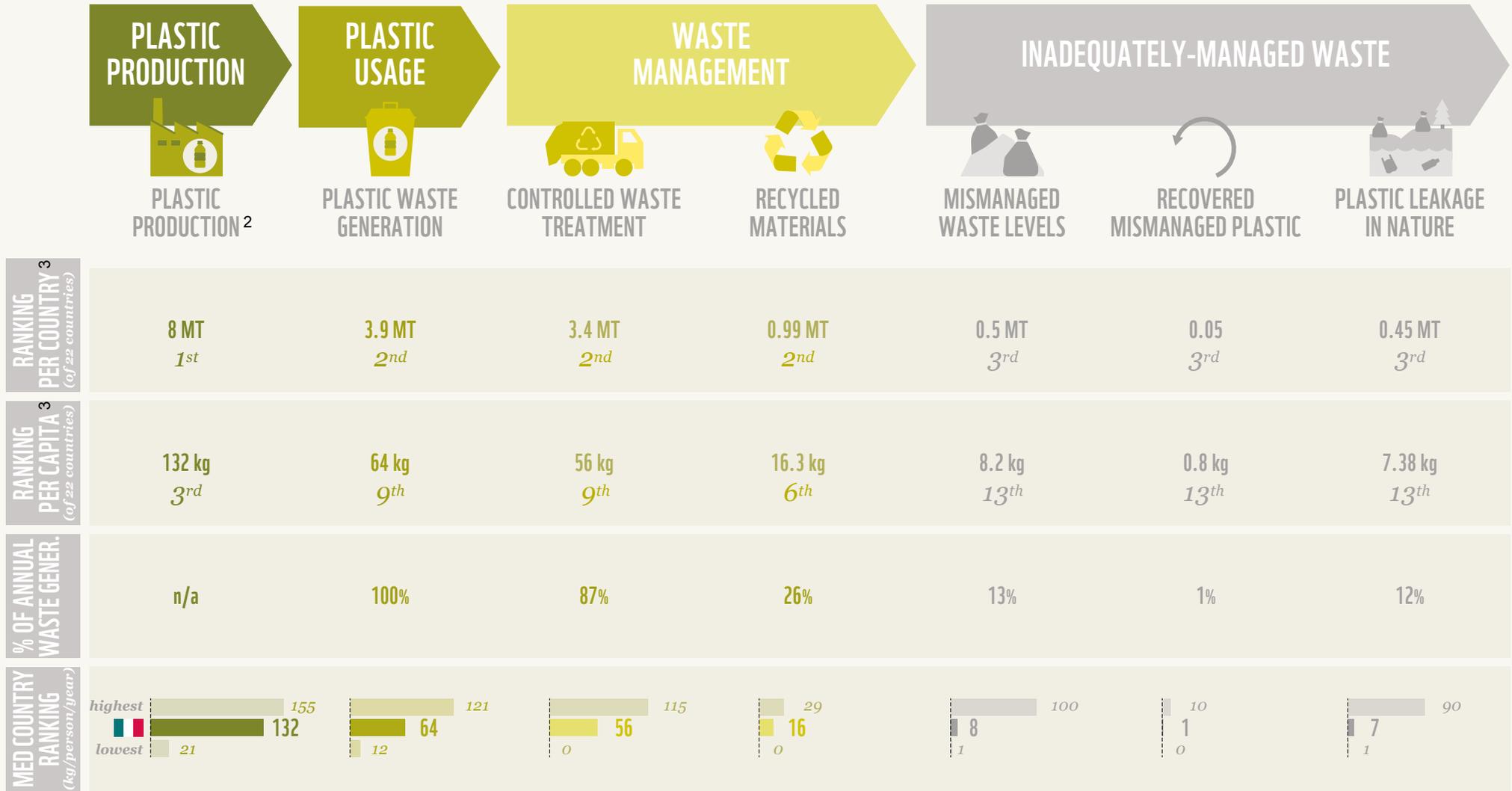


¹ Includes virgin plastics and all plastic goods produced, as reported by ISTAT under category 22: 'Articoli in gomma e materie plastiche', which cover packaging, construction, transport, textiles, electronics, industrial equipment, and others.

² A proportion of plastic generated in previous years becomes waste over time. This is already accounted in the waste generated figure.

Source: ISTAT 2017, PlasticsEurope 2018, UN COMTRADE database on imports/exports, Jambeck & al (2014), World Bank (2018), Dalberg analysis.

PLASTIC LIFECYCLE FOOTPRINT ¹



¹ See Glossary for relevant definition of all the plastic lifecycle categories.

² Includes virgin plastics and all plastic goods produced, as reported by ISTAT under category 22: 'Articoli in gomma e materie plastiche',

³ Ranking calculated from highest to lowest amount, out of the 22 countries with coastlines on the Mediterranean
Source: ISTAT 2017, PlasticsEurope 2018, Dalberg analysis, Jambeck & al (2014), World Bank (2018).

PLASTIC WASTE MANAGEMENT

- Waste is primarily managed through a 4-stream collection system (*raccolta differenziata*) whereby consumers are responsible for sorting waste between paper, plastic, glass and metal and 'humid' compostable waste, to facilitate recycling. All other waste (*indifferenziato*) is collected and primarily issued to landfill.
- However, plastic collection through the *raccolta differenziata* is lower than for other materials. In 2017, **only 38% of all collected plastic waste was collected in its separate stream**. There is high regional disparity between North-Eastern regions collecting almost 57% sorted waste, Southern Italy collects only 27%.
- Further, 13% of waste remains uncollected due to a **lack of infrastructure** in certain regions and municipalities.

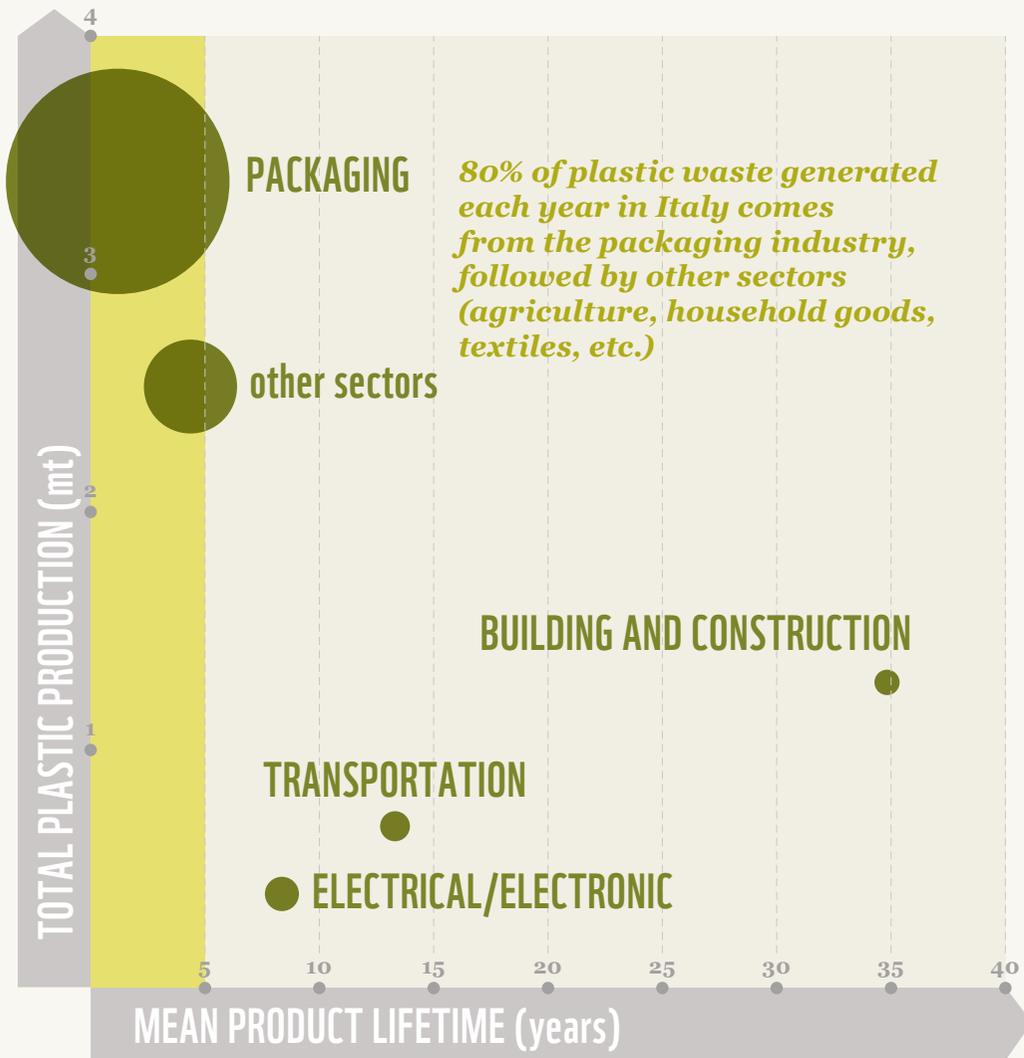
- Italy has **the largest packaging recycling industry in the Mediterranean region**. Only packaging waste is recycled. 2.2MTs of plastic waste were collected in 2017, of which 44% (1 MT) was recycled.
- **Over 60% of all waste has a linear fate in incineration or landfills**. There is a large regional disparity in the reliance on landfills. In the North, only 12% of all MSW is sent to landfill, in the Central Regions 24% is landfilled, and in Southern regions over 40% is landfilled. Incineration sees the opposite trend, with 26 of the 37 waste-to-energy facilities located in Northern regions.

26 % OF PLASTIC WASTE IS RECYCLED, WHILE >60% HAS A LINEAR FATE BY LANDFILL OR INCINERATION



¹ See definition of recycling in Annex II. This figure is the gross amount of plastic sent to recycling plants for recycling, not adjusted for actual material losses during reprocessing of plastic waste into a secondary material. Source: ISPRA, 2018: Rapporto Rifiuti Urbani, PlasticsEurope 2018, ISTAT, COREPLA, Dalberg analysis, Jambeck & al (2014), World Bank (2018).

LIFESPAN AND INDUSTRY



80% of plastic waste generated each year in Italy comes from the packaging industry, followed by other sectors (agriculture, household goods, textiles, etc.)

3/4 OF PLASTIC PRODUCED HAS A LIFE-SPAN OF <5 YEARS, AND 80% OF YEARLY WASTE IS FROM PACKAGING

- **Italy is largest producer of plastic goods in the Mediterranean**, and production of plastic goods reached 8MT in 2017, **growing at 7% over the previous five years (2012-2017)**.
- **Packaging** is the largest plastics industry in Italy producing **42% of all plastic goods**.
 - Packaging is the source of **80% of all plastic waste** given the typical product lifetime of less than one year (6 months).
 - In 2017, **2.2MTs of plastic packaging** waste was collected by municipalities.
- **Other major plastic uses** in Italy include industrial uses, textiles households and recreational productions, and agricultural equipment, amounting to **30%** of all plastic produced.
- **Building and construction and transportation** amount to **21% of all plastic produced** in Italy.
 - However, it only generates **~2%** of waste generated, given the long lifespan of plastic in these sectors.
- The **electrical sector is responsible for 6% of all plastic production**, and **~2%** of plastic waste.

Source: PlasticsEurope 2018, "Plastics, the facts" and additional national-level data provided by PlasticsEurope

ITALY RECYCLING

Overview

- In 2017, **987k tons of plastic packaging was recycled** in Italy, 562k tons from sorted MSW, and around 400k tons collected through private platforms.
- Recycling averted the production of **400k tons of virgin plastic** and the emission of **750k tons of CO₂**.
- The recycling industry employs almost **6000 people**, and the total net value of the industry in 2017 was **78M Euro**.
- Following the EU Circular Economy Action Plan, Italy is aiming to achieve its **new targets of 50% and 55% of plastic packaging recycled by 2025 and 2030**.

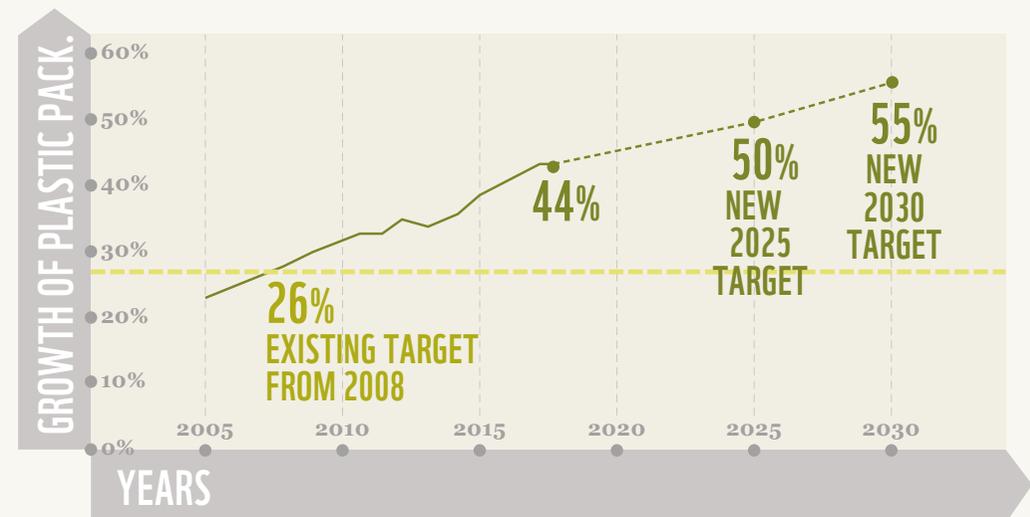
Success factors

- The **availability of quality plastic waste** has grown substantially through increased *raccolta differenziata*. Financial rewards are provided to municipalities for the quantity and quality (low contamination levels) of plastic collected.
- A **strong EPR scheme** which places shared legal responsibility for 'environmental management of waste' on both packaging producers and utilisers.
 - Most plastic producers and utilisers fulfil this ERP by participating to **CONAi** (national packaging consortium). 900,000 members make '**environmental contributions**' to fund recycling, which reached over **500 M Euro** in 2017. The set contribution for plastic is **188 €/ton**.
- Plastic packaging is then managed by **COREPLA**, the plastic material consortium, which operates material sorting into 14 streams and supports recycling facilities.

Remaining challenges

- Some gaps remain in the EPR 'producer pays' system, e.g. the environmental contribution is **not applied to packaging for export**.
- More innovation is needed to expand the types of plastic packaging that can be sent for recycling, or to streamline the process of separating 14 different plastic waste streams for treatment.
- EPR is only applied to actors within the packaging industry. Therefore, 58% of the plastic produced each year is **not covered by environmental contributions**.
- Finally, the new recycling targets are not ambitious compared to historical growth. Between 2005 and 2015, recycling grew over 4% year on year, while the 2025 target only requires 2% annual growth.

ITALY HAS THE LARGEST PACKAGING RECYCLING INDUSTRY IN THE REGION, STRIVING FOR 55% RECYCLED BY 2030



CONAi, 2018: "Insight Materia Rinnovabile: gli imballaggi nell'economia circolare", COREPLA, 2018: "Il futuro del riciclo della plastica nella circular economy", CONAi: "Packaging recovery in Italy: the CONAi system".

ITALY PLASTIC DEBRIS

53 kT/year OF PLASTIC ENTERS THE MEDITERRANEAN SEA

RIVERS

Rivers carry 4% of Italy's marine plastic. The Po accounts for 3% (1.35 kT) of annual leakage, and is the 10th single largest source of plastic pollution in the Mediterranean. The Tevere, which flows through Rome, carries 1% waste (0.6kT).

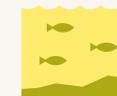


SEA-BASED

Fisheries, aquaculture and shipping result in 18% (9.5 kt) of this plastic debris. Items include crab pots, mussel nets, fishing boxes, shipping containers, jerry cans, gloves, and oil drums.

COASTAL ACTIVITIES

Coastal activities cause 78% (41.4 kt) of plastic inputs into the sea resulting from poor city waste management practices, tourism and recreational activities. The coastal cities which produce the highest amount of waste include: Catania, Venezia, Bari, Rome, Palermo and Napoli.



**PLASTICS LIFECYCLE:
45kT LEAKED INTO THE
MEDITERRANEAN SEA
IN 2016, AND 30% ENDS
UP ON THE COASTLINES
WITHIN A YEAR**

SEABED

Sea bed plastic deposits are estimated to be nine times smaller than coastline plastic accumulation. Waste on sea beds becomes almost impossible to clean up, but becomes a lower threat to marine wildlife.

COASTLINE

A quarter (12.6 kT) of the plastic pollution leaked into the Mediterranean by Italy washes back onto its shores within a year, while an additional 2% comes from other countries.

SEA SURFACE

65% of the plastic pollution remains on the sea surface 1 year after leakage, takes up to a decade to reach its final destination due to wind patterns and sea currents. Ultimately, it is estimated that 80% will make its way onto coastlines.

Source: Dalberg analysis, ISPRA 'Rapporto dei Rifiuti Urbani 2018', Jambeck & al (2014), World Bank (2018), Liubartseva et al "Tracking plastics in the Mediterranean: 2D Lagrangian model"

PLASTIC IMPACT

The environmental impact of Italy's production and consumption of plastic is higher than average:

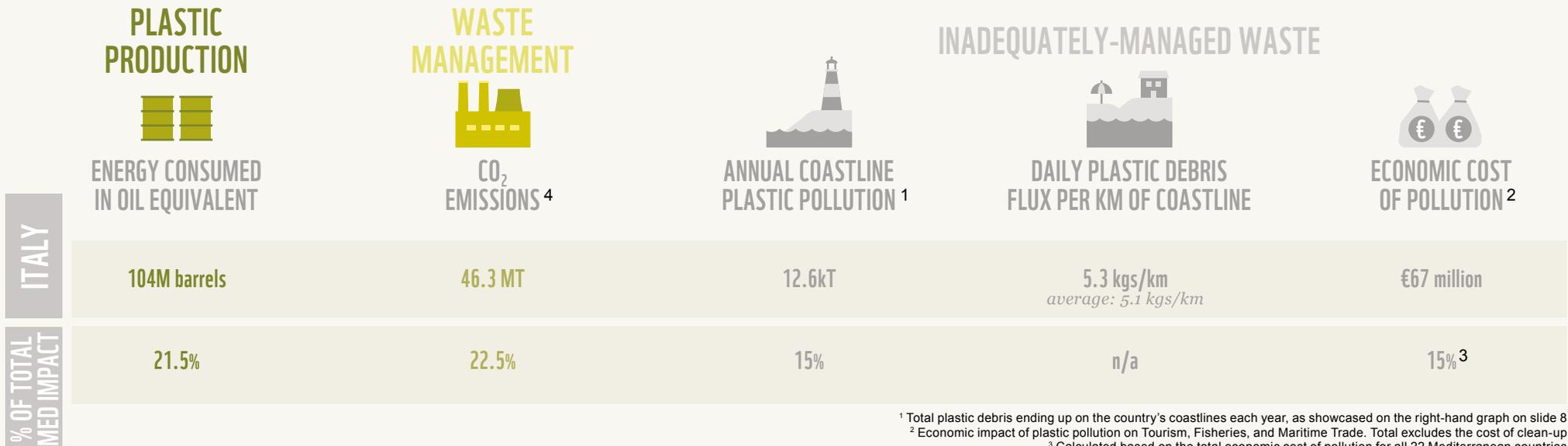
- Italy's consumption requires the equivalent of 104M barrels of oil in energy to produce, and emits 46.3 MT of CO₂, driven by the high level of incineration.
- Current plastic recycling levels help avert 750k tons of CO₂, and if increased, could help offset a larger proportion of these emissions.

Italy receives the highest total amount of coastal plastic pollution in the Mediterranean, given it has one of the longest, most exposed coastlines.

- Italy's coastlines receive, on average, 5.3 kg of plastic waste per km of coast each day.

- Liubartsevaa et al, (2018) found that Italian waters were recorded to have some of the highest concentration of floating plastic on sea surface in the Mediterranean, with up to 20g/m³ of fragmented plastic detected in the northern Adriatic, around the Po Delta and Venice Lagoon.
- The most common plastic items found on beaches are small plastic fragments (17%), plastic lids (8%), cotton buds (8%), polystyrene pieces (8%), plastic bottles and food containers (6%), plastic cups, straws and cutlery (4%), according to a small-scale survey by *Legambiente*.

ITALY'S COASTLINE EXPERIENCES SOME OF THE WORST IMPACTS OF PLASTIC POLLUTION IN THE MEDITERRANEAN



¹ Total plastic debris ending up on the country's coastlines each year, as showcased on the right-hand graph on slide 8

² Economic impact of plastic pollution on Tourism, Fisheries, and Maritime Trade. Total excludes the cost of clean-up

³ Calculated based on the total economic cost of pollution for all 22 Mediterranean countries

⁴ Total CO₂ lifecycle emissions from production, recycling and incineration (See Annex III for further details)

Source: S. Liubartsevaa et al, 2018: "Tracking plastics in the Mediterranean: 2D Lagrangian model", Dalberg analysis. Legambiente, 2018: Beach litter Report

ITALY
RECYCLING

WASTE COLLECTION IS MOST EFFECTIVE IN THE NORTHERN ITALY, AND THE SOUTH & ADRIATIC COASTS SEE THE MOST POLLUTION

Regional overview



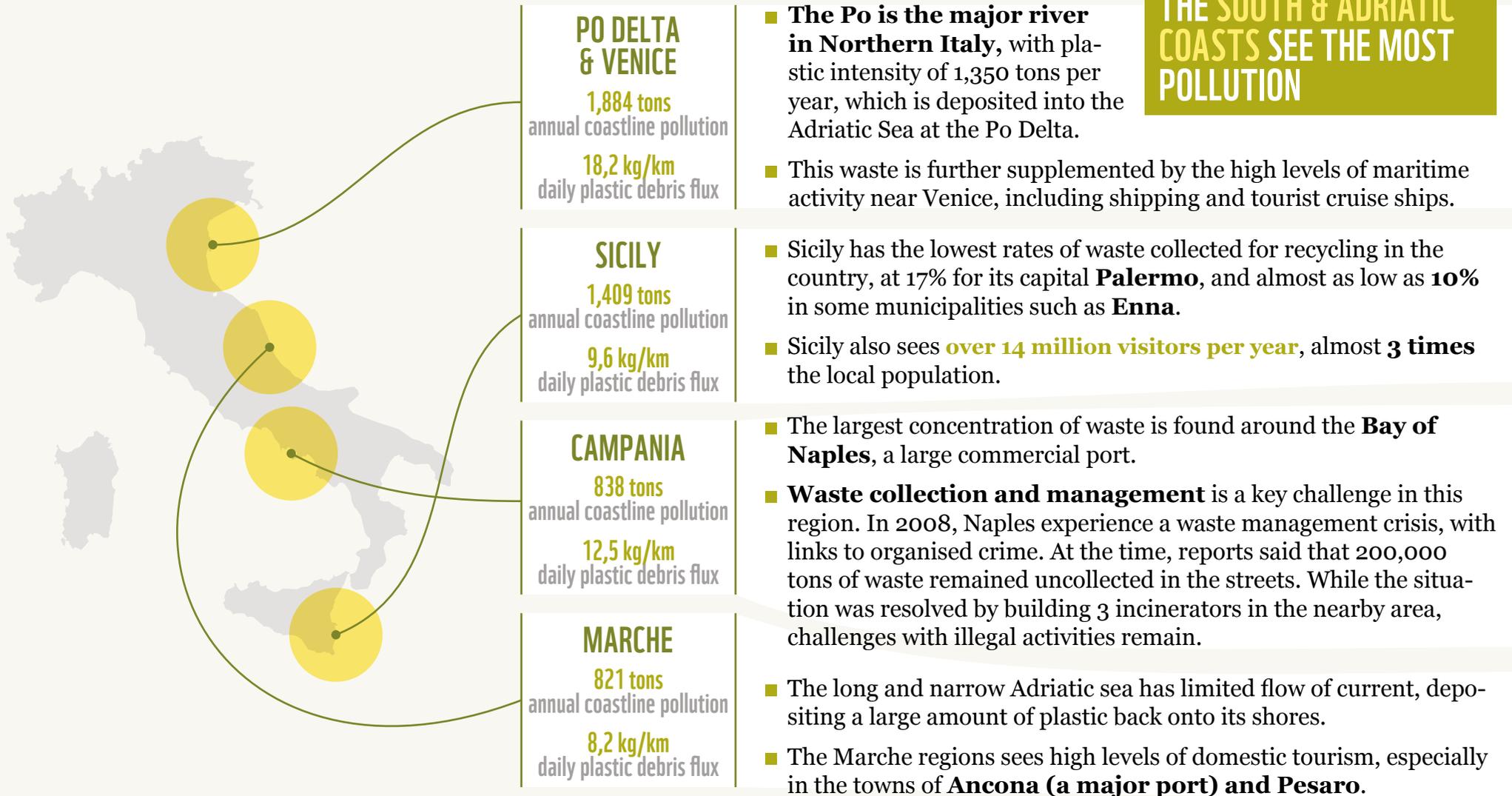
- Waste that is not collected through the raccolta differenziata system is at **far higher risk of being mismanaged, not collected or placed in open dumps, given its lower economic value.**
- In **Sicily and some of the Southern Regions (Molise, Calabria and Puglia), less than 1/3 of all MSW is sorted by consumers** (private or industry) and disposed of correctly. This might be due to lower consumer education or limited municipal capacity to collect and manage 4 different waste streams.
- Large cities face particular challenges with waste management.
 - **Naples, Rome and Genova all below the national average of 53% for waste collected for recycling.**
- High tourist influx particularly in coastal regions of **Liguria, Sicily, Lazio and Campania** can overwhelm the waste management system in these areas, which all see lower rates of collection.



Annual coastline pollution is calculated from the the daily plastic debris per km (S. Liubartsevaa et al.) multiplied by the km of coast, 365 days. Sources: S. Liubartsevaa et al, 2018: "Tracking plastics in the Mediterranean: 2D Lagrangian model", ISPRA, 2018: Rapporto Rifiuti Urbani.

MEDITERRANEAN HOTSPOTS

THE SOUTH & ADRIATIC COASTS SEE THE MOST POLLUTION



Annual coastline pollution is calculated from the the daily plastic debris per km (S. Liubartsevaa et al.) multiplied by the km of coast, 365 days. Sources: S. Liubartsevaa et al, 2018: "Tracking plastics in the Mediterranean: 2D Lagrangian model", ISPRA, 2018: Rapporto Rifiuti Urbani.

ITALY TOURISTS IMPACT



TOURISTS INCREASE WASTE BY UP TO 31% IN COASTAL REGIONS, COSTING OVER 8.8 MILLION IN WASTE MANAGEMENT

- Italy is visited by over 50 Million international tourists each year, with almost 60% of tourism occurring between June and August. Domestic tourists further increase these figures.
- In peak tourist months, tourists increase local population by over **one-third** across the regions, and in certain coastal resorts, tourists can be up to **4 or 5 times the local population** in these summer periods.
- In August and September influx in population increases the total amount of waste produced per month by almost **31%, up to 17,000 tons of additional waste**.
 - Local municipalities, can be overwhelmed by the additional waste influx, leading to uncollected waste or unsafe practices.
- Over 12 months, tourism generated more than **200,000 tons of additional MSW** across coastal regions. The management of all this additional MSW **costs the regions at least € 8.8 M in waste management** over the year.

On the other hand, tourism can be a source of initiatives or pressure to resolve plastic pollution. Examples include:

- **MSC Cruises is working with COREPLA on a trial to separately collect plastic packaging on board**, and work with port authorities to ensure collected waste is transported to the nearest recycling facilities when cruise ships dock at these ports.
- **Legambiente developed a summer Riciclaestate (Summerycycling) tour**, a travelling tour targeting 90 coastal spots in Campania and Liguria with educational games and materials, to increase the amount of waste properly disposed of by tourists.
- **A number of islands and beaches have introduced plastic bans**, including Ischia, Lampedusa, the Tremiti islands, Castellamare and several beaches in Sardinia, all implementing fines of €50 --€500. The tourism industry was an active part of the campaigns to implement these bans.
- A number of **beach establishments** (stabilimenti balneari) adhered to an eco certification scheme called **eco-spiagge per tutti**, which ensures proper raccolta differenziata and the sale of 'sustainable products' with limited packaging, amongst other measures.
- **La plastica in vacanza** is a yearly summer institutional campaign launched by COREPLA to promote proper waste management and reduce plastic litter while on holiday.

Additional waste is calculated through the influx of tourists in the region, assuming that local citizens and tourists generate the same amount of waste. The additional cost of waste management using the World Bank, 2018 estimate of \$50-100/ton of waste in an advanced system. Source: World Bank (2018), ISTAT Tourism database, Dalberg Analysis.

PLASTIC ECONOMIC IMPACT



TOURISM

ESTIMATED IMPACT:
€ 30.3 MILLION



FISHERIES

ESTIMATED IMPACT:
€ 8.7 MILLION



MARITIME TRADE

ESTIMATED IMPACT:
€ 28.44 MILLION



COST OF CLEAN-UP

ESTIMATED IMPACT:
€ 16.6 MILLION

- Plastic pollution might compromise tourist flow to particular marine areas, and threaten new private sector investment in hotel developments, etc. in these areas.
- The tourism industry often bear **the cost of clean up** to ensure locations remain attractive for tourists.
- Coastal tourism makes up **12%** of Italy's annual GDP from tourism, and provides almost 200,000 jobs in accommodation, transport, etc. An estimated **28 million tourists** visited Italy's coastal locations in 2017, around 60% of total visitors to the country.
- Marine pollution can **clog boat engines and fishing nets** leading to disruption of the fishing industry. The largest cost to the industry is related to **vehicle damage and additional maintenance caused by collision with plastic debris, and delays caused by fishing nets filling up with plastic** rather than fish.
- Marine plastic pollution reduces both the **supply of, and demand for, seafood** due to animal deaths and concerns that animals have ingested plastic.
- Italy's maritime industry is made up of transport, port facilities and shipbuilding activities.
- Transport is particularly vulnerable to collisions with plastic pollution, entanglement of floating objects with propeller blades and clogging of water intakes for engine cooling systems. Costs are incurred by **vessel downtime, delays and additional maintenance costs**.
- **Port facilities** are also at risk of damage from plastic pollution, including **clogging port waterways, creating delays incurring clean up costs**.
- Shoreline cleaning range costing under €100 per ton collected by volunteer-led initiatives, to in excess of €18,000 per ton for dense waste and heavy fishing gears.
- McIlgormet al. found that the **average shoreline clean-up cost estimate across studies has an average of US\$1500/ton (~€1300/ton)**.

ITALY'S "BLUE ECONOMY", 3rd LARGEST IN EUROPE, LOSES AN ESTIMATED €67M TO PLASTIC POLLUTION EACH YEAR

IN 2014 THE EUROPEAN COURT OF JUSTICE ORDERED ITALY TO PAY A LUMP SUM FINE OF €40 MILLION, DUE TO ITS FAILURE TO RESTORE 44 DUMP SITES FAILING TO STANDARDS OF THE LANDFILL DIRECTIVE 99/31/EC

Cost to industry is calculated based on the methodology used in McIlgormet al, 2011., taking the proxy of cost to the fishing and shipping industries from Takehama, 1990. Sources: European Commission 2018: 'Blue Economy Report', WEF, 2017: 'Travel and Tourism Competitiveness Report', EU Infringement Decisions Database, 2014. World Bank.

CURRENT POLICIES REGARDING PLASTICS

POLICY LANDSCAPE: ITALY HAS IMPLEMENTED SOME PIONEERING POLICIES TO REDUCE PLASTIC USE AND COLLECT SORTED WASTE

PLASTIC PRODUCTION



PLASTIC USAGE



WASTE MANAGEMENT



INADEQUATELY-MANAGED WASTE



EXISTING INITIATIVES

national level

municipal level

Ban on plastic bags: in 2011, Italy was one of the first to ban the manufacturing, distribution, import of non biodegradable bags (<50 microns)
Results: reduced use and growth of the bio based sector for bags.

Ban on other plastic items: in 2019, Italy was the first to ban the production and sale non biodegradable plastic cotton buds (8% of beach litter).

Results: implemented effectively, more countries to follow.

Ban on micro plastic in cosmetics:
 As of 2020, Italy will be the first country in Europe to ban micro plastics in cosmetics.

Results: Positive opinion of this law in other EU countries. However, the law is limited to cosmetics and does not include soaps or detergents, a large category at risk of leakage.

Ban on ultra light plastic bags: From 2018, only bio degradable bags can be used for food produce in shops and supermarkets.

Results: Large scale shift to bio degradable bags in supermarkets. Yet, the lack of a cost free alternative for consumers has led to some resistance.

Local ban on plastic items: E.g. the Cinque Terre have banned plastic bottles, and Capri has banned plastic bags, plates or cutlery, imposing large fines.

Education initiatives and local awareness raising: Several campaigns launched at local level by schools and municipalities.

EPR: 'Producer Pays' enforced on packaging producers and utilisers.

Results: The majority of businesses conform to CONAIv, making 'environmental contributions' per material

Landfill tax: Set min. and max. tax paid to operators. Variable: €5.2 in Campania to €28.5 in Piedmont.

Result: Overall landfill level decreased from 19MT to 6.9MT over 15 years.

Supporting recycling: New recycling targets of 50% by 2025, with financial support for COREPLA and others. **Results:** The outlook is positive: 44% of packaging was recycled in 2016.

Raccolta differenziata: Municipalities are responsible for the collection of waste in 5 streams. They are financially rewarded based on quality and quantity of material collected, sent for recycling.

Result: 38% of plastic waste collected is separated by consumers

EU Sanctions against illegal dumps: EU Directive 99/31/EC ordered the restoration of landfills opened before 2001. In 2014, Italy was fined for failing ensure safe disposal in 44 sites

Results: Italy was due to pay €40 Million to the EC, and has closed most sites, but illegal dumping connected to organised crime persists in places

Salva Mare Law: Fishermen enabled to bring ashore the plastic caught in their nets to leave in port disposal facilities without paying for disposal
Results: Piloted in Tuscany with over 16 tons collected in 5 months.

Voluntary clean up operations: Several organised beach clean up events through WWF, Legambiente, other NGOs, or municipalities.

■ industry

■ policy-makers

■ consumers

□ to be implemented

ITALY POLICY ROADMAP

POLICY LANDSCAPE: ITALY CAN EXPAND THESE INITIATIVES TO TRULY BECOME A LEADER IN REDUCTION, INNOVATION AND RECYCLING

GOALS Reducing demand: less single use plastic is produced and consumed

Closing the loop: all waste is circular

No leakage: zero plastic in nature



Continue to foster innovation on i) reusing products ii) creating alternative products iii) designing products to support recycling.

As a leader on plastic bans, Italy can expand on existing plastic bans to reduce consumption

Expand EPR to cover additional plastic uses, and use funds to expand and innovate recycling

Support municipalities who struggle with waste collection capacity and increase accountability against illegal waste dumping

EXAMPLE BEST PRACTICE INITIATIVES

national level

Work with industries to **minimize unnecessary plastic use** and encourage product **re-usability**

Support the plastic industry's transition towards new **sustainable materials and feedstocks** (consider a lifecycle)

Implement **product requirements** that standardise plastic materials to **improve sorting and recycling**

Implement new **single-use item bans**, at minimum as in the EU single-use directive (e.g. straws, plates, cutlery, stirrers), but even beyond, to include e.g., plastic cups and items beyond non-oxidable plastic or polysterine.

Ensure **monitoring** beyond formal venues (e.g. supermarkets) and apply **penalties** for non-adherence

Extend 'producer pays' obligations beyond packaging producers and users, to cover **all plastic Italian industries and exported goods**

Set a more ambitious recycling target, based on past growth, at **65% by 2025, 80% by 2030**

Invest in innovative recycling methods that **conserve the value of a recycled good** (e.g. PET)

Create **accountability mechanisms for mis-managed waste** including higher enforcement and fines on worse performing municipalities

Continue using technology to identify **illegal dumping sites** and end waste flow into these facilities

Support the EU waste proposal to **reduce landfilling to <10% of MSW**, aiming at 0% landfilling.

municipal level

Work with local businesses, including the tourism industry on e.g. local plastic bans, deposit schemes, collection systems, etc.

Develop **awareness programmes** for the public in municipalities with low levels of *raccolta differenziata*

Develop **seasonal waste management plans and finance additional capacity** for municipalities of high tourist influx.

Target municipalities with **low levels of *raccolta differenziata*** to ensure they have the logistical capacity for 5 waste streams

Create **accountability** metrics and incentives for **local waste collectors**, to prevent waste from entering a plastics black market or leaking into nature

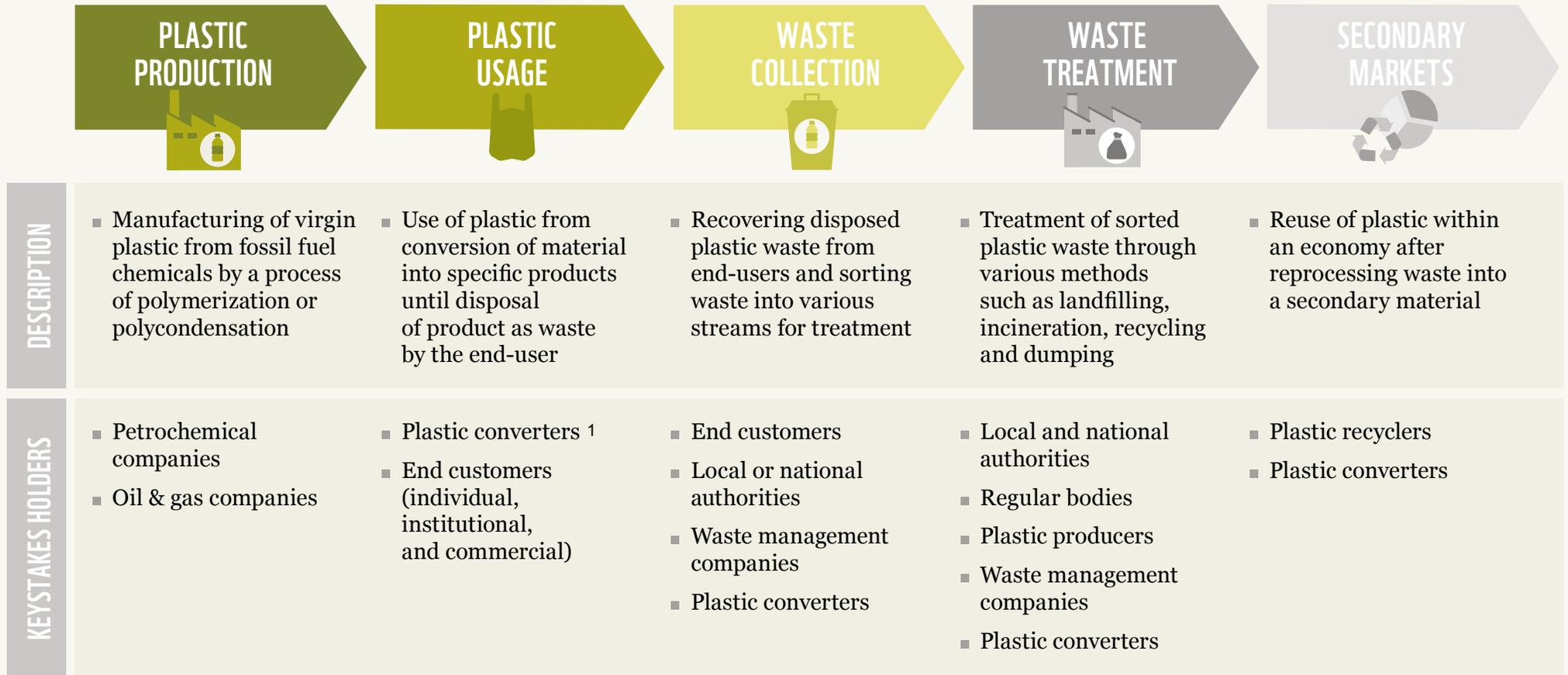
■ industry ■ policy-makers ■ consumers

PRIORITY ACTIONS – POLICY LANDSCAPING ANALYSIS

ITALY'S PRIORITIES ARE FURTHER
REDUCING CONSUMPTION,
EXPANDING EPR,
TACKLING WASTE MANAGEMENT GAPS

FOCUS AREA	POTENTIAL IMPACT	FEASIBILITY AND TIMEFRAME	PRIORITY ACTIONS
<p>1. FURTHER REDUCE CONSUMPTION OF UNNECESSARY PLASTIC</p> <ul style="list-style-type: none"> ■ Implement new plastic bans. ■ Expand the micro-plastics ban. ■ Involve industry and citizens. <p><i>Value chain segment targeted:</i></p> <p>production → usage → waste manag. → mis-manag. waste</p>	<ul style="list-style-type: none"> ■ Italy could become a front-runner in implementing the EU directive bans, and even move beyond this list. ■ Reduce levels of waste generation. ■ Improve citizen involvement in more sustainable purchasing choices. <p><i>High impact on plastic in nature</i></p>	<ul style="list-style-type: none"> ■ Feasibility: achievable Italy has a strong track record of political will to implement bans on plastic items. ■ Timeframe: short Since the approval of the EU directive, countries have been moving swiftly to approve new plastic bans. <p><i>Low difficulty to implement</i></p>	<ul style="list-style-type: none"> ■ Campaign for a binding agreement on the 10 EU directive items to ban. ■ Go beyond the key gaps in the EU directive, e.g. food and beverage containers not in polystyrene. ■ Establish industry partners willing to set standards before legal bans (e.g. soap and detergent companies eliminating microplastics in products).
<p>2. EXPAND ERP AND RECYCLING:</p> <ul style="list-style-type: none"> ■ Ensure all producers pay contributions for waste mgmt. ■ Expand recycling to other types of plastic waste. ■ Develop more ambitious targets. <p><i>Value chain segment targeted:</i></p> <p>production → usage → waste manag. → mis-manag. waste</p>	<ul style="list-style-type: none"> ■ Italy could not only meet its current 2025 and 2030 targets, but also become a European leader in recycling. ■ Raise increased financing for waste management from industry. ■ Offset additional carbon emissions. <p><i>Medium impact on plastic in nature</i></p>	<ul style="list-style-type: none"> ■ Feasibility: medium Media pressure is growing on industries to claim responsibility for plastic waste. ■ Timeframe: medium Additional recycling capacity, will require long-term investment, but Italy's historical recycling growth is promising. <p><i>Medium difficulty to implement</i></p>	<ul style="list-style-type: none"> ■ Highlight best practices of ERP from countries or industry 'top performers' ■ Communicate the economic case for increased plastic recycling, including new plastic streams. ■ Campaign for new recycling targets, in line with 2005-2015 annual growth, of 65% packaging waste recycled by 2025, 80% by 2030.
<p>3. ADDRESS CHALLENGES IN THE WASTE MANAGEMENT:</p> <ul style="list-style-type: none"> ■ Identify and address logistical and capacity challenges in worstperforming geographies. ■ Develop seasonal plans for locations with high tourism. <p><i>Value chain segment targeted:</i></p> <p>production → usage → waste manag. → mis-manag. waste</p>	<ul style="list-style-type: none"> ■ Increase the capacity of all municipalities to collect separate waste streams Improve rates of raccolta differenziata through better citizen education. <p><i>Medium impact on plastic in nature</i></p>	<ul style="list-style-type: none"> ■ Feasibility: medium-achievable Rates of collection and effective disposal have already been improving nationally. ■ Timeframe: medium-long Successful waste mgmt. requires lengthy coordination amongst several actors, and effective monitoring and enforcement. <p><i>Medium difficulty to implement</i></p>	<ul style="list-style-type: none"> ■ Focus on 'red zones', municipalities with high need, but also with strong local contacts and support. ■ Leverage the tourism industry to lobby for better waste mgmt. ■ Use public campaigns to build awareness of dangers and impact of mis-management of waste. ■ Create citizen-reporting mechanisms for mis-management.

ANNEX I – THE PLASTICS VALUE CHAIN AND STAKEHOLDERS



¹ Manufacturers of plastic products in all plastic markets (e.g. packaging, building and construction, transport) that convert virgin plastic into a specific products for use within the economy. These plastic products can be combined with other non-plastic materials during the conversion process

ANNEX II – GLOSSARY

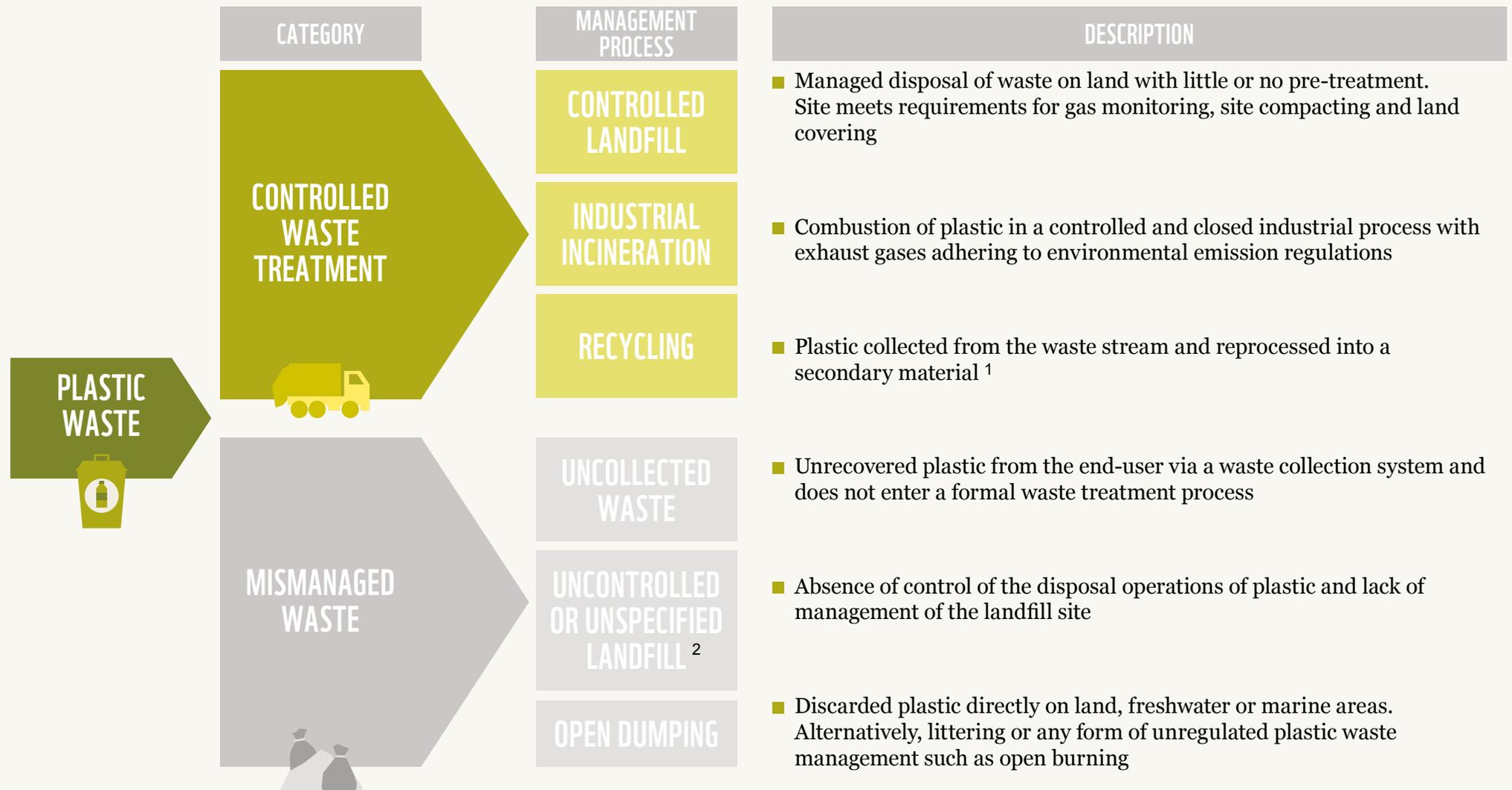
TERMS	
■ Controlled landfill	A landfilling process which is subject to a permit system and to technical control procedures in compliance with the national legislation in force.
■ Uncontrolled landfill	A landfilling process which fails to meet certain standards and technical control procedures, and therefore is at risk of leakage or contamination.
■ Open dump	Illegal land disposal sites at which solid wastes are disposed of in a manner that does not protect the environment, and are therefore susceptible to leakage, open burning, and are exposed to the elements, vectors, and scavengers.
■ Controlled waste treatment	All legally compliant waste treatment operations, including controlled landfilling, waste-to-energy (incineration) and recycling.
■ Secondary material production	The total amount of secondary plastic product extracted from the plastic recycling process, averaging at 55% of the material inputted for recycling.
■ Recycling	All plastic collected for recycling from the waste stream. This figure is not adjusted for actual material losses during reprocessing into a secondary material. These material losses result from collected plastic considered as not recyclable due to additives preventing recycling or food contamination, etc.
■ Mismanaged waste	All plastic left uncollected, openly dumped into nature, littered, or managed through uncontrolled landfills.
■ Recovered mismanaged waste	Mismanaged waste that re-enters the controlled waste management process through waste-pickers, clean up operations, or any other method.
■ Bio-degradable	A product that can be broken down by microorganisms (bacteria or fungi) into water, naturally occurring gases like carbon dioxide (CO ₂) and methane (CH ₄) and biomass.
■ Blue Economy	Represents all economic activities related to oceans, seas or coastal areas. It covers established sectors such as fisheries, shipbuilding and tourism as well as emerging industries, including ocean energy and biotechnology.

ANNEX III – METHODOLOGY FOR THE CALCULATION OF EACH DATA METRIC IN THIS GUIDEBOOK

SECTION	METRIC	METHODOLOGY
PLASTIC LIFECYCLE (MT)	<ul style="list-style-type: none"> Plastic produced 	Collected national-level data on total production of PP, PET, HDPE, LDPE, PCV and PS. Plastics are used in many products that are imported and exported and limited public data exists separating these goods into their raw materials used. This plastic goods production data by country is not adjusted for international trade (import and export) of these products. If national plastic goods data unavailable, calculated based on the ratio of global plastic production to plastic waste for 2016 in the WWF global plastics report (78%).
	<ul style="list-style-type: none"> Waste Generation and Management 	Collected national-level data on total plastic waste generation per annum, or total waste MSW waste generation and percent composition of plastic within MSW. Also collect national-level data on plastic management (percentages of plastic waste collected landfilled, incinerated, recycled or openly dumped). Data validated with relevant WWF national offices.
	<ul style="list-style-type: none"> Mismanaged waste 	Calculated by adding the total waste which goes uncollected, openly dumped and sent to uncontrolled landfills. Data on uncollected waste is taken from the World Bank ‘What a Waste 2.0’ Database.
	<ul style="list-style-type: none"> Waste recovered or leaked into nature 	Calculated using the proxy of 90% of mismanaged waste ending up in nature, based on the study completed by Jenna Jambeck Research Group, 2015. We assume the rest of the waste is recovered through clean-up operations, etc.
	<ul style="list-style-type: none"> Waste leaked into the Mediterranean 	<ul style="list-style-type: none"> - For countries whose coastline are only on the Mediterranean, this figure is calculated based on the proxy that 10% of plastic waste becomes marine litter, as found in the analysis completed by Jenna Jambeck Research Group, 2015. - For countries with multiple coastlines, this figure also takes into consideration the proportion of waste generated by regions with coastlines on the Mediterranean.
	<ul style="list-style-type: none"> Waste leaked by source (sea-based, rivers, coastal) 	Collected data on sea-based sources and major rivers from S. Liubartsevaa et al, 2018. Where data is missing for other major rivers, annual plastic flux is calculated as a ratio between the Po River’s drainage basin, and its annual plastic flux. Coastal sources represent the remainder of annual leakage.

SECTION	METRIC	METHODOLOGY
PLASTIC IMPACT	<ul style="list-style-type: none"> Energy consumed in oil equivalent (M, barrels) 	Calculated based on the weighted average of energy required to make a kilogram of global plastic (PP, PET, HDPE, PS, PCV), converted into barrel of oil equivalent.
	<ul style="list-style-type: none"> Average age of plastic life (years) 	Calculated based on national data collected on the production of plastic per industry, and the average lifetime of plastic goods in each industry, as found in peer-reviewed research completed by Roland Geyer et al, <i>“Production, Use, and Fate of All Plastics Ever Made”</i> , 2017
	<ul style="list-style-type: none"> CO₂ emissions (MT) 	Calculated based on the average CO ₂ emissions caused by plastic production, incineration and recycling, as reported by SITRA, 2018: <i>“The Circular Economy a Powerful Force for Climate Mitigation”</i> .
	<ul style="list-style-type: none"> Annual coastline plastic pollution (kT) 	Calculated based on the daily plastic debris flux (kg/km) multiplied by the total length of the coastline and 365 days. This differs from the total plastic leaked into nature as it doesn't include plastic on the sea -bed and sea-surface.
	<ul style="list-style-type: none"> Daily plastic flux (kg/km) 	Collected data from S. Liubartsevaa et al, 2018: <i>“Tracking plastics in the Mediterranean: 2D Lagrangian model”</i> .
	<ul style="list-style-type: none"> Economic cost of pollution (M, €) 	Calculated based on the methodology used in McIlgorm et al, 2011 to estimate the cost of plastic pollution to the APAC region, which takes the proxy of cost to the fishing and shipping industries from Takehama, 1990.
	<ul style="list-style-type: none"> Cost of waste generated by tourists (M, €) 	Calculated based on the proportion of waste generation caused by tourists, which was calculated based on national statistics on tourist arrivals and departures. The cost uses the World Bank estimated cost of \$50-100/T of waste in an advanced system.

ANNEX IV – PLASTIC WASTE SYSTEM ACTIVITIES CAUSING CONTROLLED AND MISMANAGED WASTE



¹ Not accounting for plastic losses during the recovery process
² Unless explicitly specified as “controlled” or “sanitary” landfills, we consider all other landfills as uncontrolled.
 Source: Dalberg analysis, Jambeck & al (2015), World Bank (2018), SITRA (2018), European Commission (2001)

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- Plastic Trade (Import/Exports): UN COMTRADE, Categories 3901-3915
- Tourism Arrivals: ISTAT 2017, ‘Presenza Turistiche’
- European Commission Infringement Decisions Database, 2014.
- Waste Management: World Bank, What a Waste 2.0



0.45

mt of plastic waste leaked into nature each year.

1st

Italy is the first producer of plastic goods in the region

80%

of plastic packaging should be recycled in Italy

€67

mill is lost by Italy's Blue Economy due to plastic pollution each year



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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