



Regulating Plastic Pollution



Pollution Statistics

- **300 MILLION** tons of plastic produced every year
- **8 MILLION** tons of plastic are dumped into our oceans every year
- **50 PERCENT** of all plastic is “single-use”
- **40 PERCENT** of all plastic produced is used as packaging
- **550 MILLION** straws thrown away every day in US / UK alone
- **500 BILLION** plastic bottles used every year worldwide
- **27.4 BILLION** disposable diapers thrown away every year in the U.S.
- **1+ TRILLION** plastic bags discarded every year worldwide



Polyethylene terephthalate (PET)
Water bottles, dispensing containers, biscuit trays



High-density polyethylene (HDPE)
Shampoo bottles, milk bottles, freezer bags, ice cream containers



Low-density polyethylene (LDPE)
Bags, trays, containers, food packaging film



Polypropylene (PP)
Potato chip bags, microwave dishes, ice cream tubs, bottle caps

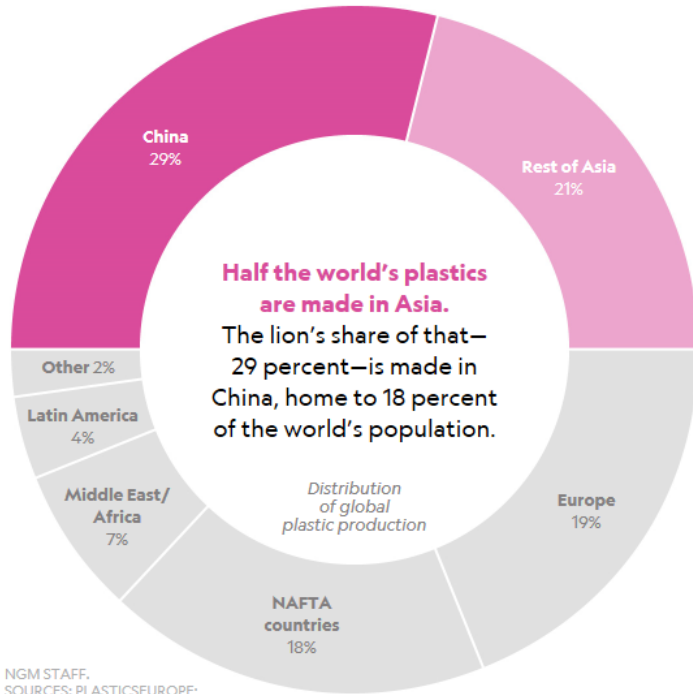


Polystyrene (PS)
Cutlery, plates, cups



Expanded polystyrene (EPS)
Protective packaging, hot drink cups

Production vs. Recycling



NGM STAFF.
SOURCES: PLASTICSEUROPE;
POPULATION REFERENCE BUREAU



Plastic recycling rates are highest in Europe at 30 percent.
China's rate is 25 percent.
The United States recycles just 9 percent of its plastic trash.

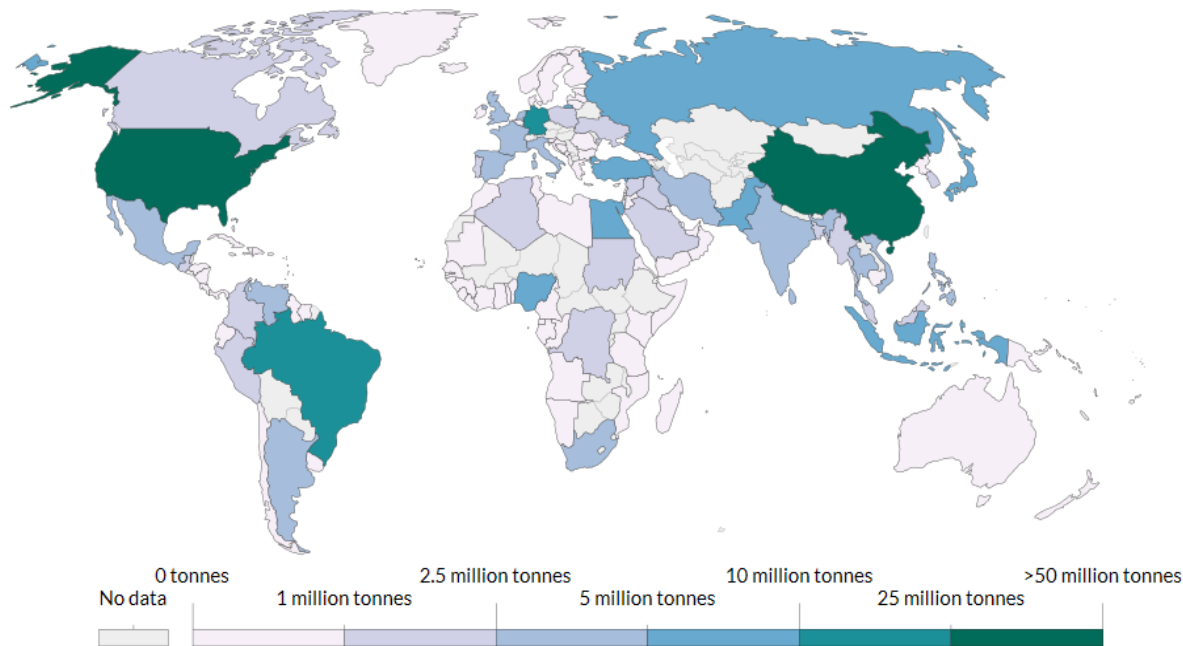
NGM STAFF. SOURCE: ROLAND GEYER, UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Total Plastic Waste – Per Ton

Plastic waste generation, 2010

Total plastic waste generation by country, measured in tonnes per year. This measures total plastic waste generation prior to management and therefore does not represent the quantity of plastic at risk of polluting waterways, rivers and the ocean environment. High-income countries typically have well-managed waste streams and therefore low levels of plastic pollution to external environments.

Our World
in Data



Source: OWID based on Jambeck et al. (2015) & World Bank

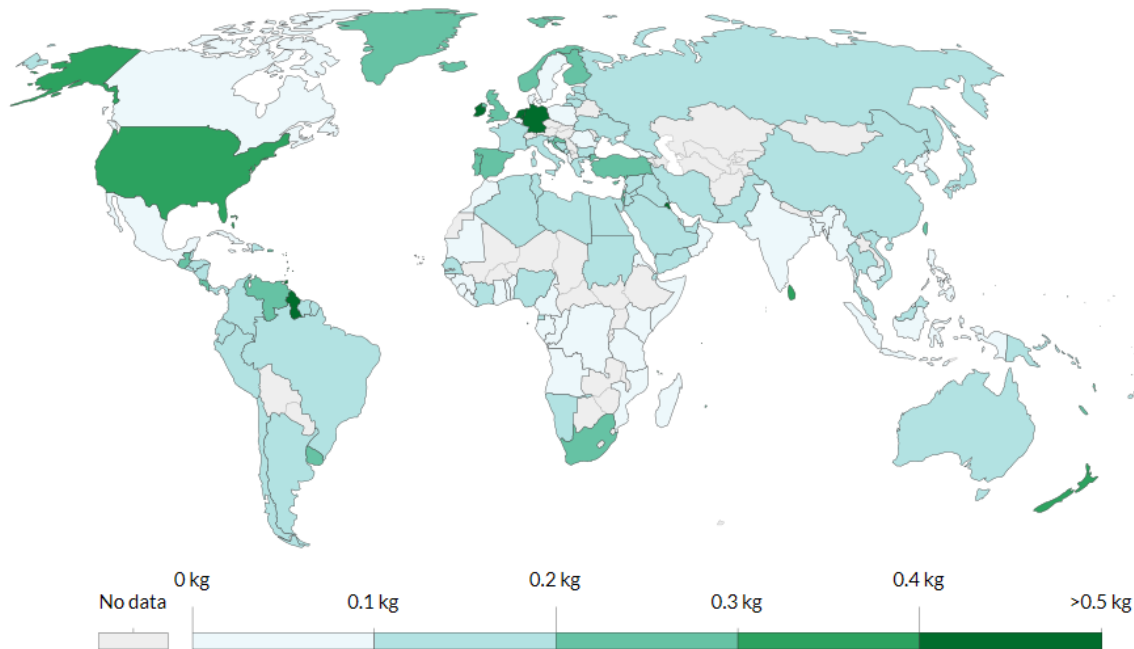
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Daily Plastic Waste – Per Person

Plastic waste generation per person, 2010

Daily plastic waste generation per person, measured in kilograms per person per day. This measures the overall per capita plastic waste generation rate prior to waste management, recycling or incineration. It does not therefore directly indicate the risk of pollution to waterways or marine environments.

Our World
in Data



Source: Jambeck et al. (2015)

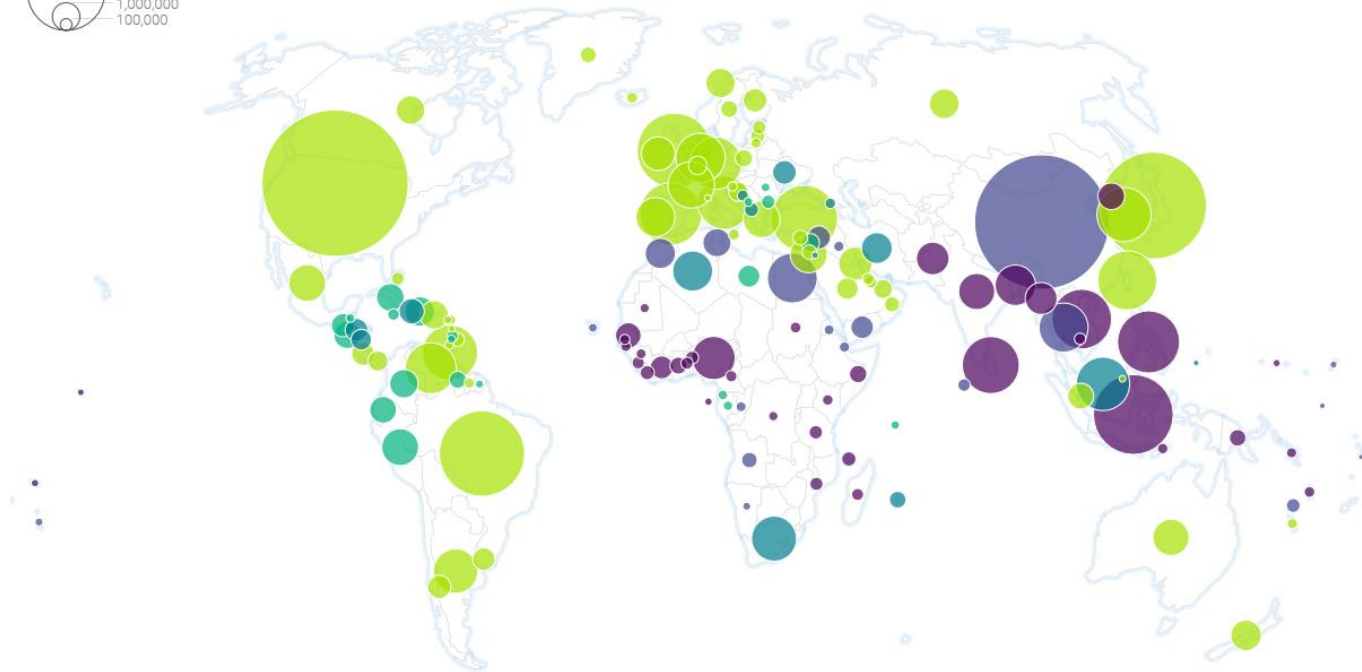
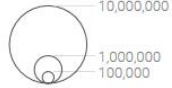
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Plastic Waste Generation by Nation

% of inadequately managed plastic waste

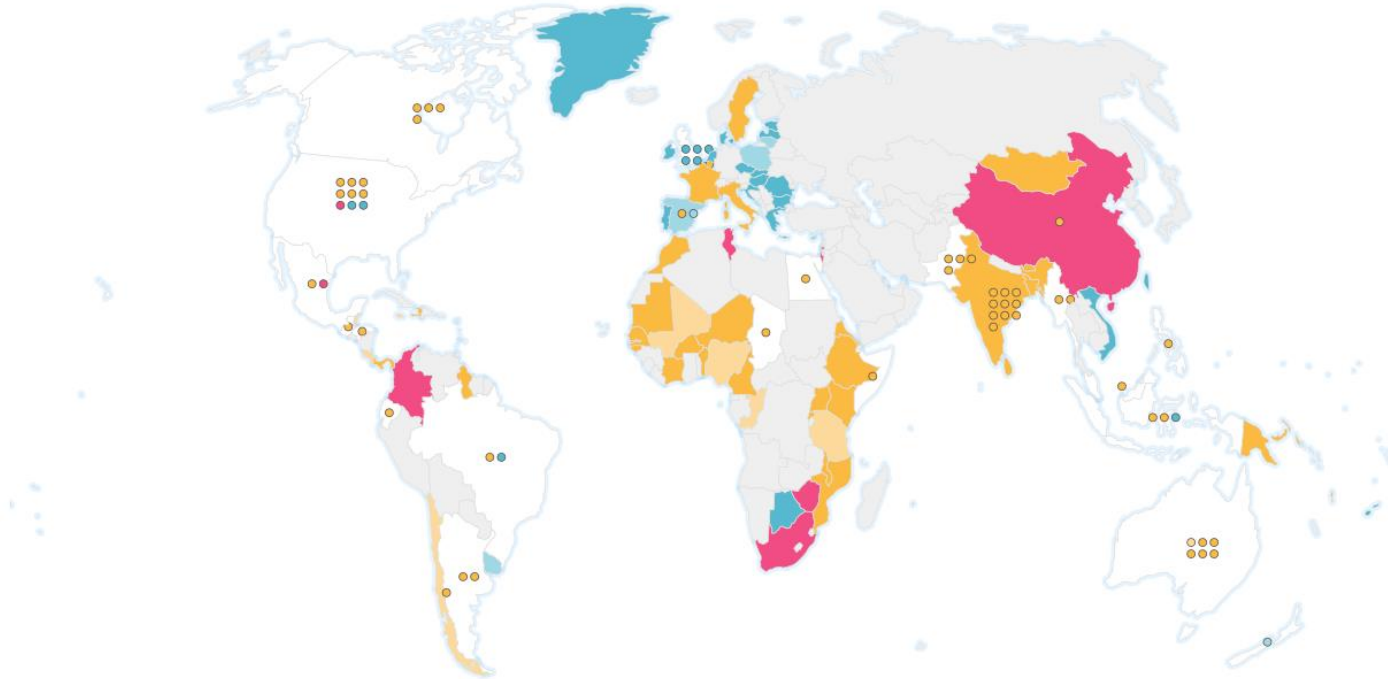


Tons of plastic waste generated annually



Government Regulations

- Ban approved (light), in force (dark)
- Levy approved (light), in force (dark)
- Ban and levy approved (light), in force (dark)



Rivers to Ocean



10 rivers alone carry more than **90% of the plastic waste** that ends up in the oceans:

1. Chang Jiang (Yangtze River) **1,469,481** tons
2. Indus **164,332** tons
3. Huang He (Yellow River) **124,249** tons
4. Hai He **91,858** tons
5. Nile **84,792** tons
6. Meghna, Brahmaputra, Ganges **72,845** tons
7. Zhujiang (Pearl River) **52,958** tons
8. Amur **38,267** tons
9. Niger **35,196** tons
10. Mekong **33,431** tons

Ocean Conservancy

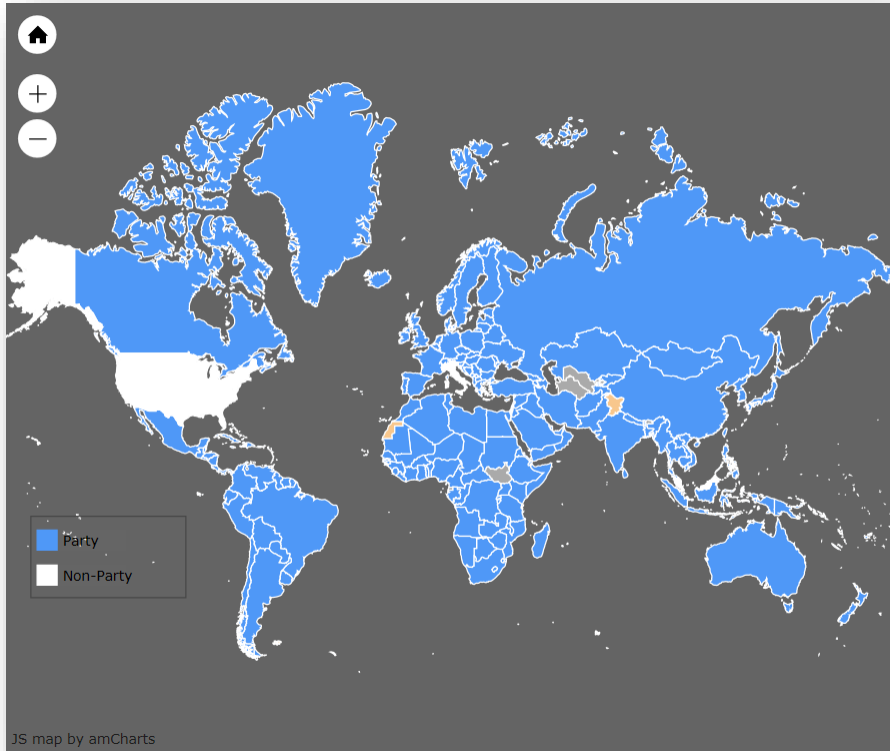
2017 Ocean Cleanup – U.S. Index (FLORIDA)



1. Cigarette Butts	<u>95,679</u>
2. Plastic Bottle Caps	<u>74,420</u>
3. Food Wrappers	<u>37,683</u>
4. Plastic Beverage Bottles	<u>31,948</u>
5. Straws / Stirrers	<u>26,500</u>
6. Plastic Grocery Bags	<u>14,190</u>
7. Other Plastic / Foam Packages	<u>8,431</u>

Plastic Contamination

Polychlorinated Biphenyls (PCBs) and the Stockholm Convention



- ❖ Used in manufacturing in the U.S. from 1929 – 1979 until banned nationally
- ❖ One of 12 Persistent Organic Pollutants (POPs) covered by the Stockholm Convention (2001)
- ❖ Parties of convention committed to eliminating use by 2025
- ❖ U.S. chose not to sign due to restrictions on local, state, and federal government
- ❖ Concerns of POP bioaccumulation in fish / marine life – nearly 60 percent of human population rely on fish as food source

Policy Options

Education vs Regulation

What makes sense for “U.S.” ?



Voluntary Reduction

Education campaigns, special events, partnerships, and voluntary agreements between organizations



Levy / Fee

Levy on suppliers, retailers, consumers, producers, or a combination of the above



Mandate / Penalty

Prohibition of specific uses or activities, or comprehensive policy including requirement of municipal services



Voluntary Reduction

Public Education, Community Outreach, and Public-Private Partnerships



UN Single-Use Plastics Study

“Nationwide campaigns seem to be less effective than **locally targeted campaigns.**”



“Acceptance from the broadest range of stakeholders is of utmost importance, and can be ensured through calls for early inputs, policy discussion meetings, and wide-reaching awareness campaigns.” – UN Environment

Private – NGO Initiatives

(Ellen MacArthur Foundation) – New Plastics Economy Global Commitment

Targets include to:

- **Eliminate** problematic or unnecessary plastic packaging and move from single-use to reuse packaging models
- **Innovate** to ensure 100% of plastic packaging can be easily and safely reused, recycled, or composted by 2025
- **Circulate** the plastic produced, by significantly increasing the amounts of plastics reused or recycled and made into new packaging or products



Reusable vs Single-Use

- About 350 cities, counties, and states in the U.S. have banned or heavily taxed single-use plastic bags
- Where bans / levies were imposed, plastic bag use was reduced dramatically
- Many reusable bags will still end up in a landfill due to challenges with recycling
- Reusable bags will not eliminate need for conventional plastic bags for household waste
- A 2018 Danish Study found that polypropylene bags (green reusable at supermarkets) should be used 37 times
- Similar UK Study concluded various polyethylene bags should be used between 4 and 11 times
- US Study also concluded similar results and found that these reusable (grocery) bags are only more environmentally friendly if used enough times

Ireland Case Study

UN Analysis of levy on plastic bags in Ireland (2002)

- Introduced a tax on plastic bags at point of sale
- Set 6x higher than reported willingness to pay
- Levy revenue paid into an Environmental Fund
- Collected & enforced at the national level
- Proved that a high levy can be successfully introduced
- Requires a high degree of stakeholder buy-in
- Significant investment in education campaigns
- Sensible administration at practicable policy levels – eliminated 90% plastic bags

Regulation Challenges

- Outright prohibitions common in underdeveloped nations
- Varying degree of success due to lack of enforcement / infrastructure
- Lack of stakeholder involvement creates more burdens on gov't
- Local vs. State vs. Federal policy
- Lack of formal education in many communities about alternatives



FLORIDA MUNICIPALITIES THAT HAVE SINGLE-USE PLASTIC STRAW ORDINANCES

- Coral Gables
- Ft. Lauderdale
- Lauderdale by the Sea
- Hallandale Beach
- Hollywood
- Fort Myers
- Dania Beach
- Delray Beach
- Marco Island
- Sanibel
- Largo
- Miami Beach
- Surfside
- Pompano Beach
- St. Petersburg
- Key Biscayne
- Pinecrest
- Deerfield Beach

FLORIDA MUNICIPALITIES THAT ARE CURRENTLY CONSIDERING SINGLE-USE PLASTIC STRAW ORDINANCES

- Sarasota
- St. Augustine Beach
- West Palm Beach

New York City Case Study

Ban on Styrofoam (EPS foam) Containers in 2015

- Originally introduced in 2015 – ban led to lawsuit via recycling firm coalition
- Ban was overturned in the same year by the NY Supreme Court when manufacturers claimed Styrofoam is recyclable
- Reinstated in 2017 following a report that concluded it is not possible to recycle Styrofoam in a manner that is economically feasible or environmentally effective
- Lesson learned – stakeholder involvement early on is imperative

Questions?



References

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