



City of Berkeley ZERO WASTE COMMISSION Regular Meeting

Thursday, June 19, 2025 at 5:30 p.m.
City of Berkeley Corporation Yard (Ratcliff Building, Willow Room)
1326 Allston Way, Berkeley, CA, 94702

MEETING AGENDA

PRELIMINARY MATTERS:

- 5:30 pm 1. Call to Order by Chair and Roll Call by Secretary
- **Steven Sherman**, appointed by CM Rashi Kesarwani, District 1
 - **Christienne de Tournay (Chair)**, appointed by CM Shoshana O'Keefe, District 5
 - **VACANT**, appointed by Mayor Adena Ishii
 - **Layla Dargahi (Vice Chair)**, appointed by CM Terry Taplin, District 2
 - **Dennis Uyat**, appointed by CM Ben Bartlett, District 3
 - **Philip Monrad**, appointed by CM Igor Tregub, District 4
 - **Sandra Curtis**, appointed by CM Brent Blackaby, District 6
 - **Swasti Johri**, appointed by CM Cecilia Lunaparra, District 7
 - **Barun Singh**, appointed by CM Mark Humbert, District 8
- 5:35 pm 2. Approve Meeting Agenda and Order of Agenda Items
- 5:40 pm 3. Approve Draft Action Minutes:
- May 15, 2025 Regular Meeting*
- 5:45 pm 4. Public Comment on Items Not on the Agenda
Speakers are allotted up to two minutes. Speakers may be allotted less time at the discretion of the Chair.
- 5:55 pm 5. Commissioner Announcements
Commissioners may make general announcements; no action will be taken.
- 6:00 pm 6. Staff Updates

DISCUSSION AND ACTION ITEMS:

Members of the public may provide comments at the end of each discussion item and prior to the vote of the Commission on any action items. Speakers are allotted up to 2 minutes.

- 6:15 pm 1. Informational Zero Waste Insert in City of Berkeley Residential Leases
- 6:45 pm 2. Video: Petaluma Reusable Cup Program Review
- 7:00 pm 3. Review Green Building Ordinance

- 7:15 4. Report outs from the Special Events Subcommittee and Green Building Subcommittee
- 7:25 pm 5. Discuss Future Agenda Items
- 7:30 pm 6. Adjournment

INFORMATION ITEMS:

Information items may be moved to discussion but no action will be taken

COMMUNICATIONS:

Communications from the public are included as links or attachments in the agenda packet.

PowerPoint from Susan Collins, Container Recycling Institute presentation at the April 2025 meeting

***Indicates material included in the agenda packet**

**** Indicates material to be available at the meeting**



ADA Disclaimer: This meeting is being held in a wheelchair-accessible location. To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services Specialist at 981-6418 (V) or 981-6347 (TDD) at least three business days before the meeting date. Please refrain from wearing scented products to this meeting.

SB 343 Disclaimer:

Any writings or documents provided to a majority of the Commission regarding any item on this agenda will be made available for public inspection at the Public Works Department located at the address below.

Communications Disclaimer:

Communications to Berkeley boards, commissions or committees are public record and will become part of the City's electronic records, which are accessible through the City's website. Please note: e-mail addresses, names, addresses, and other contact information are not required, but if included in any communication to a City board, commission or committee, will become part of the public record. If you do not want your e-mail address or any other contact information to be made public, you may deliver communications via U.S. Postal Service or in person to the secretary of the relevant board, commission or committee. If you do not want your contact information included in the public record, please do not include that information in your communication. Please contact the secretary to the relevant board, commission or committee for further information.

Commission Secretary:

Julia A. Heath, Recycling Program Manager,
Zero Waste Division, 1201 Second St. Berkeley, CA 94710
510-981-6357
jheath@berkeleyca.gov

MINUTES

The meeting was convened at 5:35p.m. with presiding Layla Dargahi as Vice Chair.

ROLL CALL

Present: Layla Dargahi, Steven Sherman, Dennis Uyat, Philip Monrad, Barun Singh, Sandra Curtis

LOA: Chrise de Tournay, Swasti Johri

Absent:

STAFF PRESENT: Julia Heath

MEMBERS OF THE PUBLIC PRESENT:

PUBLIC COMMENTS (on non-agenda items):

ACTION MINUTES:

- **Approval of the May 15, 2025 Regular Meeting Agenda**
Action Taken: M/S/C (Sherman/Monrad) to approve the May 15, 2025 meeting agenda.
Ayes: Unanimous; Abstain: Barun Singh, Sandra Curtis None; Absent: Chrise de Tournay, Swasti Johri
- **Approval of the April 17, 2025 Regular Meeting Minutes**
Action Taken: M/S/C (Uyar/Monrad) to approve the March 20, 2025 meeting minutes.
Ayes: Unanimous; Abstain: None; Absent: Chrise de Tournay, Swasti Johri
- **Public Comment**
0 public comment. No Action Taken.
- **Commissioner Announcements**
Discussion only. No Action Taken.
- **Staff Updates**
Discussion only. No Action Taken.
- **Presentation on Legislative Updates by Krystal Raynes, Californians Against Waste**
Discussion only. No Action Taken.
Public Comment: 0
- **Presentation by Commissioner Sandra Curtis on Plastics**
Discussion only. No Action Taken.
Public Comment: 0
- **Complete 2026 Work Plan**
Action Taken: M/S/C (Sherman/Curtis) to approve the 2026 Work Plan.

Ayes: Unanimous; Abstain: None; Absent: Chrise de Tournay, Swasti Johri

- **Report out from the Special Events Subcommittee and Green Building Subcommittee**

Discussion only. No Action Taken.

Public Comment: 0

- **Discuss Future Agenda Items**

Public Comment: 0

- Discuss including an informational Zero Waste insert in all City of Berkeley issued residential leases.
- Presentation about Copenhagen by Commissioner Sandra Curtis
- Presentation about Vision 2025 by Margo

- **Adjournment at 7:45 p.m.**

M/S/C (de Tournay/Uyat) to adjourn the meeting.

Ayes: Unanimous; Abstain: None; Absent: Barun Singh, Sandra Curtis

The next regular meeting of the Zero Waste Commission will be held on Thursday, June 19, 2025 at 5:30 p.m. in person at City of Berkeley Corporation Yard (Ratcliff Building, Willow Room) 1326 Allston Way, Berkeley.

Respectfully Submitted

Julia A. Heath, Secretary

A Zero Waste Vision for 2025: A California Legislative Update

Krystal Raynes
Legislative Associate





The mission of Californians Against Waste is to **protect communities** by eliminating the pollution inherent in the extraction and disposal of natural resources.

CAW believes in **preventing waste at its source** and **holding producers responsible** throughout a product's lifecycle to transition California to a thriving circular economy.



Recent Campaigns

Fighting Food Waste At The Source

AB 660 (Irwin, 2024) bans the use of consumer-facing "sell-by" dates and requires food manufacturers to use uniform terminology when labeling their products with "safety" or "quality" dates.

Stopping Greenwashing and Deceptive Environmental Claims

SB 343 (Allen, 2021) and AB 1201 (Ting, 2021) prohibited manufacturers from calling their products "recyclable" or "compostable" unless they are likely to actually get recycled or composted.

AB 1857 (C. Garcia, 2022) and AB 881 (Gonzalez, 2021) reclassified burning trash and exporting mixed plastic overseas as disposal instead of recycling, eliminating incentives for these harmful practices.

Building a Bigger, Better Bottle Bill

SB 1013 (Atkins, 2022) and SB 353 (Dodd, 2023) expanded California's "Bottle Bill" deposit law to include wine and juice, respectively.

AB 962 (Kamlager, 2021) added support for refillable beverage containers to the CRV program.

Preventing Plastic Pollution

SB 1046 (Eggman & Gonzalez, 2022) and SB 1053 (Blakespear, 2024) banned the distribution of plastic produce bags and check out bags, respectively.

Establishing A Right to Repair

SB 244 (Eggman, 2023) requires manufacturers of consumer electronics and appliances to provide replacement parts, diagnostic information, and service literature to consumers and third-party repair businesses.

Recovering Batteries and Battery-Embedded Products

SB 1215 (Newman, 2022) created an end-of-life solution for products with batteries by adding them to the state's landmark e-waste recycling program.

AB 2440 (Irwin, 2022) created a manufacturer-funded takeback and recycling program for loose batteries.

January- February

- 1 -

**AUTHOR
INTRODUCES
BILL**

*Can be an Assembly or
Senate Bill (AB/SB)*



February- May

- 2 -

**BILL PASSES
FIRST HOUSE**

*1. Policy Committee
2. Appropriations
Committee
3. Floor Vote*



May- September

- 3 -

**BILL PASSES
SECOND HOUSE**

*1. Policy Committee
2. Appropriations
Committee
3. Floor Vote*



September- October

- 4 -

**BILL IS SIGNED
BY GOVERNOR
AND
CHAPTERED**

The finish line!



California Legislative Process

**there are a ton of rules, exceptions, and waivers not mentioned. See me after class if you are curious.*

CURRENT PRIORITY LEGISLATION



Scaling Up California Composting

SB 279 (McNerney) expands composting capacity to cut methane emissions, reduce landfill waste, and provide farmers with sustainable alternatives to open burning. By removing regulatory barriers, it strengthens local composting, improves soil health, and boosts climate resilience.



Requiring Tethered Caps

SB 45 (Padilla & Blakespear) will require plastic beverage container manufacturers to tether caps to bottles, eliminating a leading source of litter.



Banning Disposable Vapes

AB 762 (Irwin & Wilson) will ban the sale of non-refillable or non-rechargeable vapes.



Expanding California's Ban on Plastic Microbeads

AB 823 (Boerner) expands California's existing ban on intentionally-added plastic microbeads to include cosmetics, cleaning products and coatings.

AB 762

(Irwin & Wilson)



AB 762 would prohibit the sale of nonrefillable or nonrechargeable vapes.



SB 279

(McNerney)

“

SB 279 will provide California farms and vineyards with an eco-friendly alternative [to open burning] – the ability to compost large amounts of green waste onsite rather than having to ship it to another composting facility hundreds of miles away.

**SENATOR
JERRY MCNERNEY**

**SCALING UP CA
COMPOSTING**



SB 279 would support small, medium, & on -farm composting by:

- Expanding **on -farm composting options**
- Reducing **community compost permitting requirements**
- Increase **food waste processing capacity**



AB 823

(Boerner)

MICROPLASTICS
ARE IN OUR

**CLEANING
PRODUCTS**

AB 823 would ban intentionally added microplastics in cleaning products and personal care products.

MICROPLASTICS
ARE IN OUR

COSMETICS



SB 45

(Padilla & Blakespear)

SB 45 will require plastic beverage bottles under 2 liters to use tethered caps —caps that remain attached to their bottles throughout their lifecycle —by 2027.



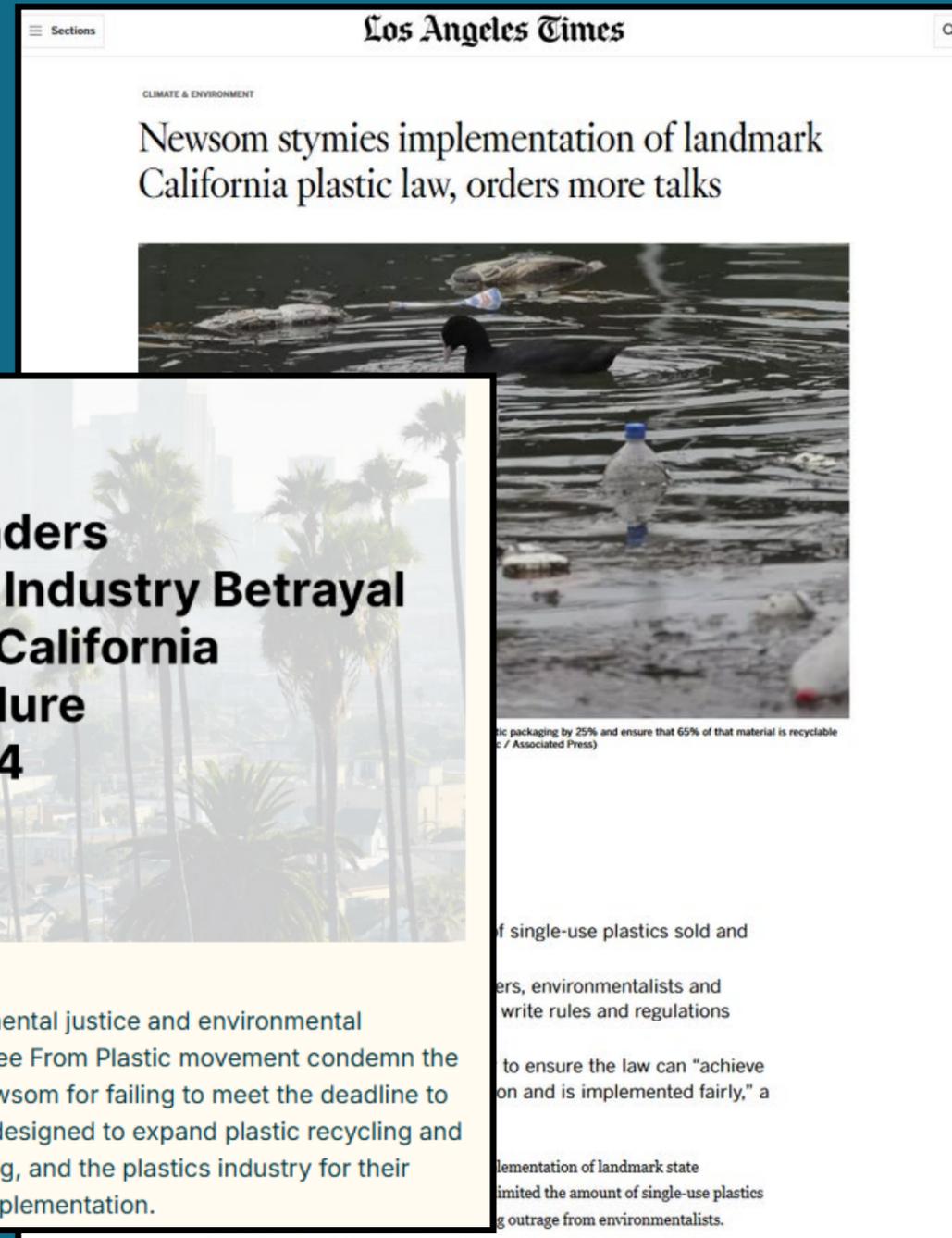
SENATOR
PADILLA

SENATOR
BLAKESPEAR

SB 45
REQUIRING
TETHERED CAPS



Implementing & Protecting SB 54, SB 343, AB 1201, & SB 1383



“I think now that the shiz is hitting the proverbial fan, everyone has very strong opinions about how to proceed and what’s reasonable and what is not,” said Allen, the state senator who designed and sponsored the law.

LA TIMES 2/15/25

#BreakFreeFromPlastic

Environmental Leaders Condemn Plastics Industry Betrayal of Compromise in California and the State’s Failure to Implement SB 54

Sacramento, California – Today, environmental justice and environmental sustainability organizations in the Break Free From Plastic movement condemn the State of California and Governor Gavin Newsom for failing to meet the deadline to implement landmark California legislation designed to expand plastic recycling and limit the use of single-use plastic packaging, and the plastics industry for their continuous efforts to derail the statute’s implementation.

Other bills:

AB 28 (Shiavo)	Would enact the Landfill Safety Act which would require landfill operators to continuously monitor and publicly report flare gas temperatures and impose corrective actions and penalties if temperatures exceed specified thresholds for extended periods. It also establishes a fund to mitigate harm from high landfill gas temperatures and mandates permit suspensions or revocations for persistent violations.
AB 998 (Hadwick)	Would create pathways for schools to dispose of confiscated vape pens by reclassifying them as Household Hazardous Waste rather than commercially generated hazardous waste when in the school's property. Would also allow schools to temporarily transport vape waste to authorized collection facilities.
AB 1148 (Sharp Collins)	Would enact the Safer Food Packing Act of 2025 which would ban bisphenols and or phthalates in food packaging.
AB 1325 (M. Rodriguez)	Would end CalRecycle's Used Oil Recycling Program and instead establish a PRO + stewardship program for used oil from automobiles.
AB 473 (Wilson)	Would rescind AB 343 (truth in labeling) by allowing unrecyclable products to still be labeled as "recyclable" between 2027 and 2032.

Other bills:

SB 501 (Allen)	Would create a producer responsibility program for products classified as household hazardous waste, as well as establish a producer responsibility organization (PRO) to oversee collection of producer fees and to produce a stewardship plan that ensures the safe and convenient collection and management of covered products at no cost to consumers or local governments.
SB 561 (Blakespear)	Would establish a producer responsibility organization (PRO) to oversee the financing, collection, and disposal of unwanted or expired distress flares, shifting the financial burden of their waste management from local ratepayers to the industry manufacturing hazardous products.
SB 594 (Padilla)	Would require a local enforcement agency to hold a publicly noticed hearing and certify that any proposed landfill will not disproportionately impact an environmental justice community in order to obtain a waste discharge permit.
SB 353 (Alvarado Gil)	Would remove the sunset of the Farm to Table Tax Credit which allows a 15% tax credit for farms that donate food products to food banks.
SB 615 (Allen)	Would require EV battery suppliers to ensure the responsible end-of-life management, repurposing, and recycling of lithium-ion vehicle traction batteries. Would also establish reporting requirements, a state fund for oversight, and penalties for non-compliance to prevent environmental and safety hazards from abandoned batteries. Would require the battery supplier to pay reasonable regulatory costs of implementation. It would also require DTSC to reevaluate the prevalence of vehicle battery abandonment on an ongoing triennial basis.



Sign Onto Our 2025
Legislation Here!

Krystal Raynes

Legislative Associate

Californians Against Waste

krystal@cawrecycles.org

Questions?

frankie

teddy

"the roosevelts"





Photo by [Antoine GIRET](#)

Plastic in Environmental Pollution and Climate Change

Understanding the environmental and health impacts of plastic within the context of climate change and the lifecycle of the plastic

The Graduate - 1967



Mr. McGuire wants to enlighten the adrift graduate, played by Dustin Hoffman, about trends of the future:

*“Benjamin, I want to say one word to you. Just one word ... **Plastics.**”*

Expanding further to the vaguely confused young man ...

*“**There’s a great future in plastics.**”*

In a short time . . .

BRIEF HISTORY OF PLASTIC BAG USAGE



First plastic sandwich
bags introduced

1957



Department stores
start using plastic bags

1970's



Supermarket chains
introduce plastic bags

1980's

An Urgent Global Crisis



Gorakshap, Khumjung, Nepal



Cape Town



Nigeria



Sahara Desert



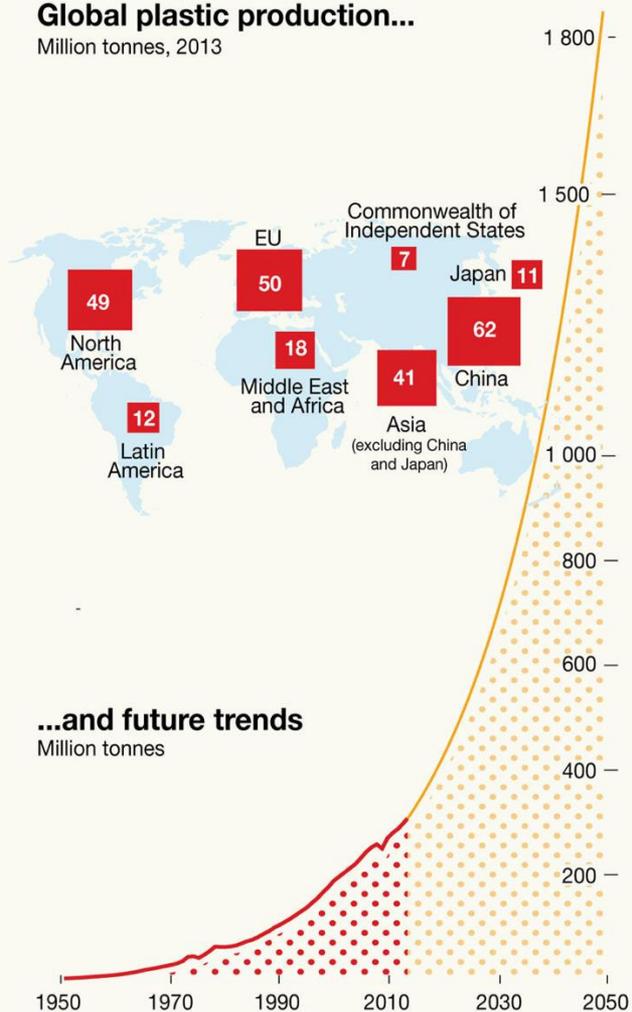
Maldives



Indonesia

Global plastic production...

Million tonnes, 2013



What's the magnitude of the problem?

- 8 million metric tons of plastic enter the ocean annually.
- 8.3 billion metric tons of plastics have been produced in the last 70 years and is increasing exponentially.
- Plastics' largest market is single-use packaging.
- Plastic throughout its lifecycle is a serious source of greenhouse gas emissions, contributing to climate change.

Plastic waste continues to rise in 2024

11 APRIL 2024 15:18



waste plastic bottles and other types of plastic waste at the Thilafushi waste disposal site.

220 MILLION TONS of plastic generated in 2024

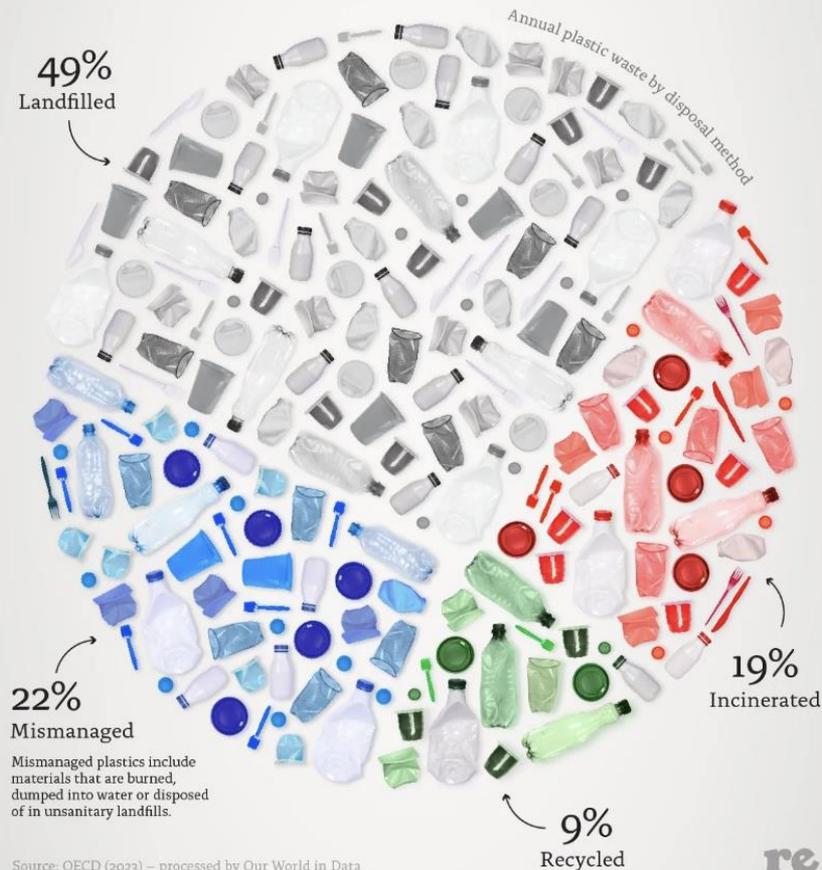
7.11% rise/year since 2021

Over 1/3 mismanaged at EOL equaling 68.6 million tons in nature

Global average of 28kg per person.

SORTING THE WORLD'S PLASTIC

How much plastic waste actually gets recycled globally?



Source: OECD (2023) – processed by Our World in Data
Numbers have been rounded. Latest figures from 2019.

re
DESIGNS

Actual Global Recycling Rate – 9%

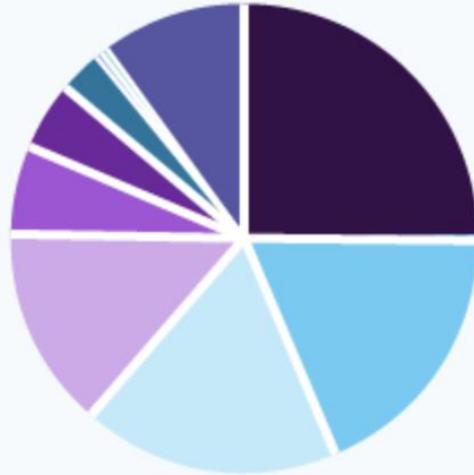
19% Incinerated

22% Mismanaged

49% Landfilled

Global Plastic Market

Share, by End-use, 2023 (%)



- Automotive
- Packaging
- Electrical & Electronics
- Building & Construction
- Consumer Goods
- Industrial Machinery
- Aerospace & Defense
- Optical Media
- Medical Devices
- Others

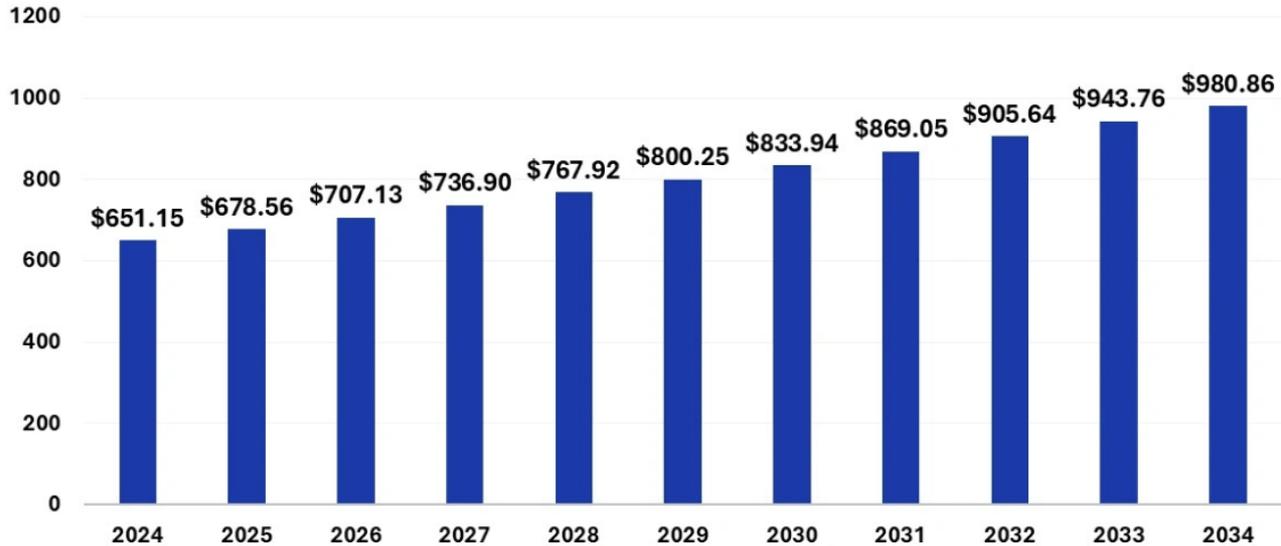


\$624.8B

Global Market Size,
2023

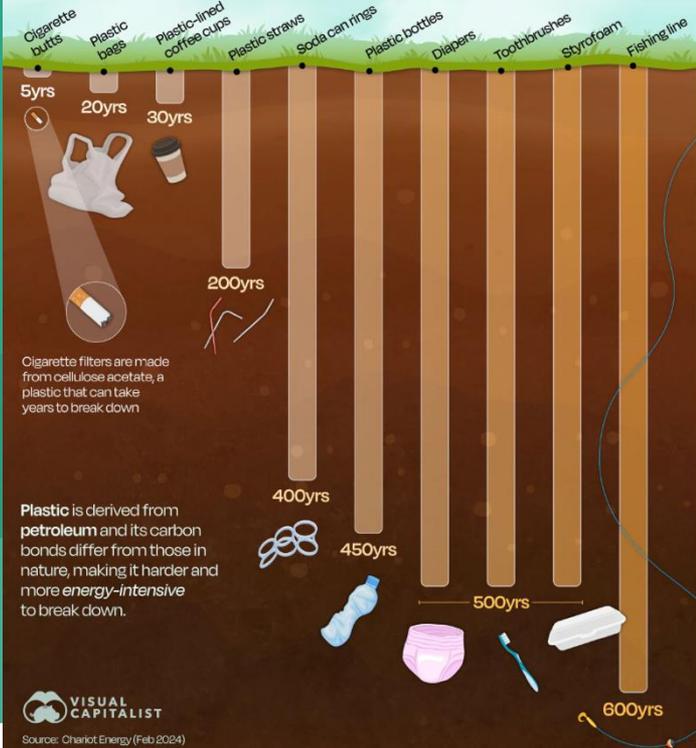
Source:
www.grandviewresearch.com

Plastics Market Size 2024 to 2034 (USD Billion)



Source: <https://www.precedenceresearch.com/plastics-market>

HOW LONG DOES *Plastic* Take to Decompose?



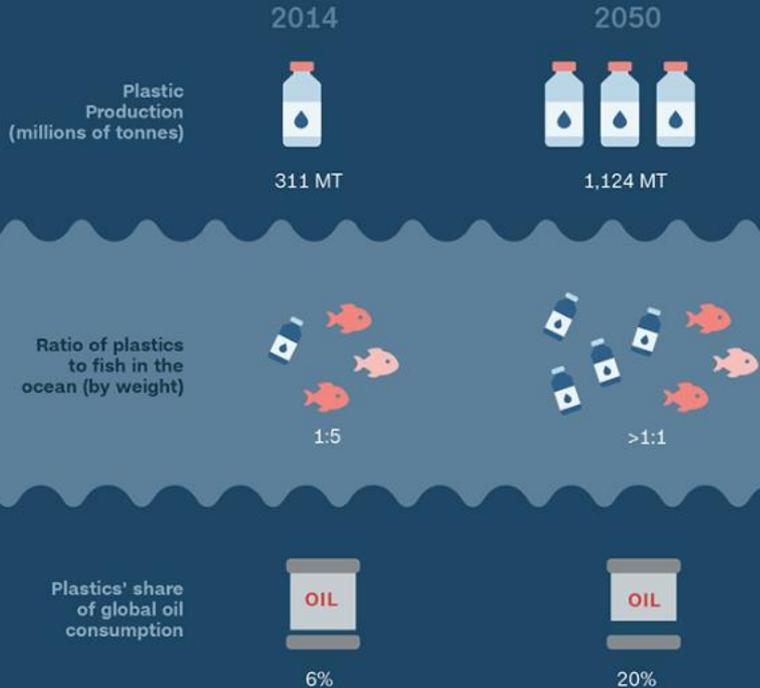
Time to Decompose Plastics

Estimated Minimum and Maximum Chart by Waste Type



How long will plastic be here?

Plastic Worlds



SOURCE: WORLD ECONOMIC FORUM

The Problem – There is NO “Away.”

“BY 2050, THERE COULD BE MORE PLASTIC
IN THE OCEAN BY WEIGHT THAN FISH. “

Ellen MacArthur Foundation,
New Plastics Economy

ENVIRONMENTAL HARM AND POLLUTION

- Huge volume of plastic
- Very slow decomposition rate
- Poor recycling rates
- Cheaper to produce fresh plastic
- Accumulation of unrecycled plastic in aquatic environments
- Huge leakage into oceans, rivers and lakes



Manila Bay,
Phillippines



Existential Threat to Life on Earth



Global plastic use and waste on track to triple by 2060



- "Plastic pollution is one of the great environmental challenges of the 21st century, damaging ecosystems and human health.
- Since the 1950s, Of the over 8 billion tons of plastic produced since the 1950s, over 60 percent was tossed into landfills, burned or dumped directly into rivers and oceans.
- Project the use of plastics nearly triple in 4 decades

This chart illustrates the growth of plastic use throughout the years

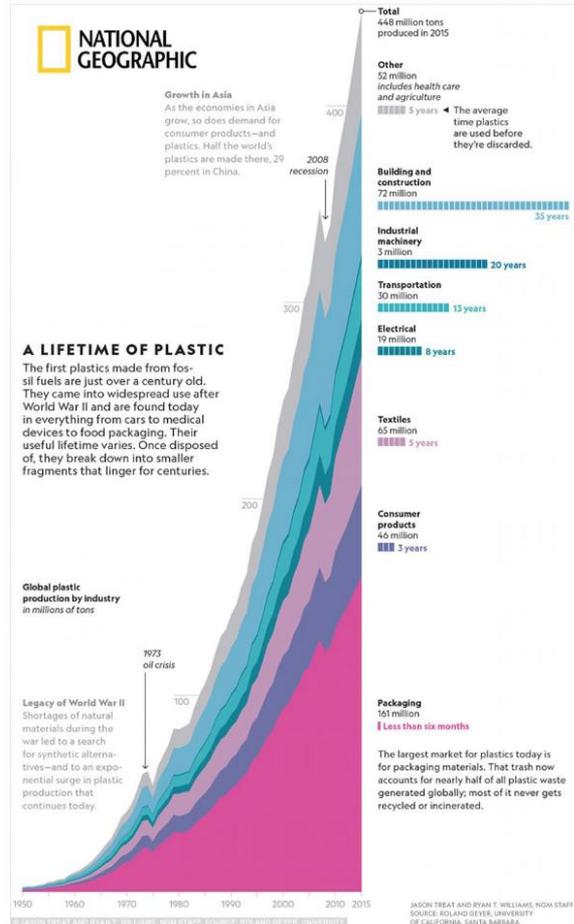


Image credits: JASON TREAT AND RYAN WILLIAMS

2015 tons by sector, time of use before discard

Production by sector in 2015:

- **Total tons** - 450 million
Discard > than 5 years
- **Consumer products** – 46 million tons
Discard >3 years
- **Packaging** – Half of all plastic made 161 million tons
Discard > 6 mos.

270
million metric tons
Global plastic production*

275
million metric tons
Total plastic waste

Plastic waste inputs from land into the ocean in 2010

The 192 countries with a coast bordering Atlantic, Pacific, and Indian oceans, Mediterranean and Black seas produced a total of 2.5 billion metric tons of solid waste. Of that, 275 million metric tons was plastic, and an estimated 8 million metric tons of mismanaged plastic waste entered the ocean in 2010.

99.5
million metric tons
Coastal plastic waste

31.9
million metric tons
Coastal mismanaged plastic waste

8
Million metric tons of plastic waste goes into the ocean

6,350-245,000 metric tons**

Estimated mass of plastic waste floating at the ocean surface

Generated by 2 billion people within 50 km (30 miles) of the coast

Mitigation options:

Reduce plastic in waste stream

Improve solid waste management infrastructure

Increase capture

*Plastics Europe, "Plastics—the Facts 2013" (2010 data)

**Cózar et al., 2014; Erksen et al., 2014

80% of Plastic Waste goes from Land to Sea

The Complete Lifecycle of Plastic



Fossil fuel extraction & transport



Production and manufacturing



Disposal of plastic waste



Ongoing environmental impact



Major CO2 Equivalents attributed to Plastic Production

In 2015 in the U. S., emissions from Fossil Fuel Extraction and Production attributed to Plastic Production were at least 9.5-10.5 Million Metric Tons of CO₂e (Carbon Dioxide equivalents).

GHGs from Plastics

Even tiny pieces of plastic emit GHGs





PETROCHEMICAL
AND PLASTIC
INDUSTRIES ARE
PLANNING A
MASSIVE
EXPANSION IN
PRODUCTION; THE
PROBLEM IS ON
TRACK TO GET
MUCH WORSE.



Terri
Baumgartener

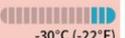
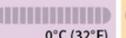
Two critical reports released in Feb. 2019 from the Center for International Environmental Law - CIEL



THE 7 TYPES OF PLASTICS

THEIR TOXICITY AND WHAT THEY ARE MOST COMMONLY USED FOR

TOXICITY CODE:  LOW  HIGH

Polymer Name	POLYETHYLENE TEREPHTHALATE	HIGH-DENSITY POLYETHYLENE	POLYVINYL CHLORIDE	LOW-DENSITY POLYETHYLENE	POLYPROPYLENE	POLYSTYRENE	All other plastics, including acrylic, fiberglass, nylon, polycarbonate, and polylactic acid (a bioplastic)
Resin Identification Code							
Abbreviation	PET or PETE	HDPE	PVC	LDPE	PP	PS	OTHER
Recyclable?	Commonly Recycled	Commonly Recycled	Sometimes Recycled	Sometimes Recycled	Occasionally Recycled	Commonly Recycled (but difficult to do)	Difficult to Recycle
Percentage Recycled Annually							
How Long to Decompose Under Perfect Conditions	5-10 Years	100 Years	Never	500-1,000 Years	20-30 Years	50 Years	Majority of these plastics: never Polylactic acid: 6 months
Maximum Temperature	 70°C (158°F)	 120°C (248°F)	 70°C (158°F)	 80°C (176°F)	 135°C (275°F)	 90°C (194°F)	Polycarbonate: 135°C (275°F) Polylactic acid: 150°C (302°F)
Brittleness Temperature	 -40°C (-40°F)	 -100°C (-148°F)	 -30°C (-22°F)	 -100°C (-148°F)	 0°C (32°F)	 -20°C (-4°F)	Polycarbonate: -135°C (-211°F) Polylactic acid: 60°C (140°F)
Toxicity Level							
Most Commonly Leached Toxin(s)	Antimony Oxide, Bromine, Diazomethane, Lead Oxide, Nickel Ethylene Oxide, and Benzene	Chromium Oxide, Benzoyl Peroxide, Hexane, and Cyclohexane	Benzene, Carbon Tetrachloride, 1,2-Dichloroethane, Phthalates, Ethylene Oxide, Lead Chromate, Methyl Acrylate, Methanol, Phthalic Anhydride, Tetrahydrofuran, and Tribasic Lead Sulfate, Mercury, Cadmium, Bisphenol A (BPA)	Benzene, Chromium Oxide, Cumene Hydroperoxide, and Tert-butyl Hydroperoxide	Methanol, 2,6-di-tert-Butyl-4-Methyl Phenol, and Nickel Dibutyl Dithiocarbamate	Styrene, Ethylbenzene, Benzene, Ethylene, Carbon Tetrachloride, Polyvinyl Alcohol, Antimony Oxide, and Tert-butyl Hydroperoxide, Benzoquinone	BPA, BPS, as well as all other toxins mentioned

Types of Plastic – Number, Uses, Toxicity



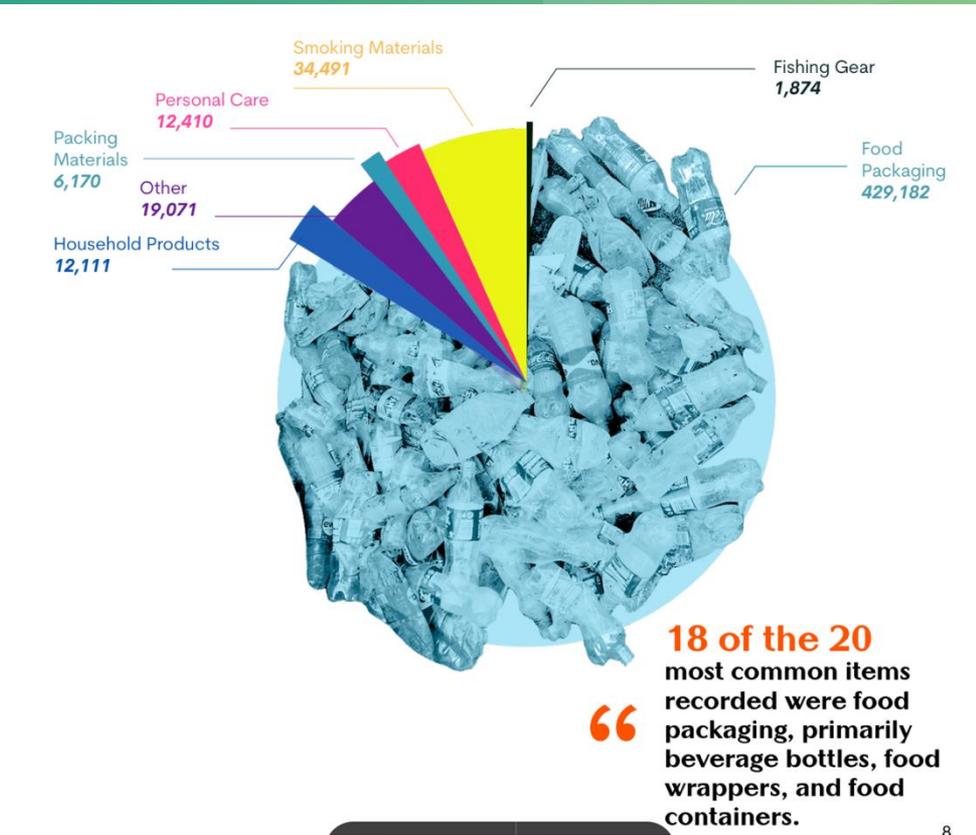
Beware - #1,3 6,7

Annual Break Free From Plastic Brand Audit 2024

The analysis reveals that this year's top global plastic polluters are



The Coca-Cola Company, Nestlé, Unilever, PepsiCo, Mondelēz International, Mars, Inc., Procter & Gamble, Danone, Altria, and British American Tobacco.



18 of the 20 most common items recorded were food packaging, primarily beverage bottles, food wrappers, and food containers.

Food packaging made up 90% of trash collected in 2024 BFFP Annual Brand Audit

Break Free From Plastic - BFFP Brand Audit 2024

Top 5 Most Common Types of **Food Packaging** Found in BFFP Global Brand Audit 2023



If the entire plastic lifecycle were a country, it would be the fifth largest emitter of greenhouse gases in the world.

Global Impacts in Water

PLASTIC FIBERS IN TAP WATER, 2017



orb. one world. one story.

PREVALENCE OF MICROSCOPIC PLASTIC FIBERS BY SAMPLE SOURCE LOCATION.



WORLDWIDE
83 PERCENT



USA
94 PERCENT



EUROPE
72 PERCENT



INDONESIA,
JAKARTA
76 PERCENT



INDIA,
NEW DELHI
82 PERCENT



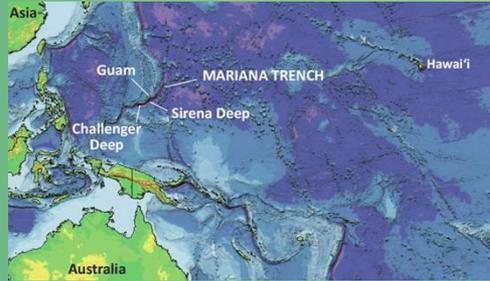
LEBANON,
BEIRUT
94 PERCENT



UGANDA,
KAMPALA
81 PERCENT



ECUADOR,
QUITO
75 PERCENT



Marianna Trench



Arctic Ice



From the Arctic to the deepest part of the ocean and the water we drink

Global Impacts on Wildlife



Entanglement, Ingestion, Entrapment,
Habitat Damage, Chemical Exposure

Global Impacts in the Air

Incineration causes air pollution with Dioxin emissions,



Intelligent Living

Burning Plastic Waste Is Adding To Air Pollution In India

Images may be subject to copyright. [Learn More](#)



Burning plastic waste at a dumpsite in Mejkerto, Indonesia. Photo: Fully Handoko/EPA

Burning Plastic - Toxins from Incineration cause pollution and health risks in soil and air

Global Impacts on Soil

- From processed sewage sludge used for fertilizer (solids filtered out of waste water - from laundry, personal care products , urban runoff)
- In waste water used for irrigation Discarded protective seed coatings
- Plastic mulch - Sheets of plastic suppress weeds, warm the soil, and retain moisture.

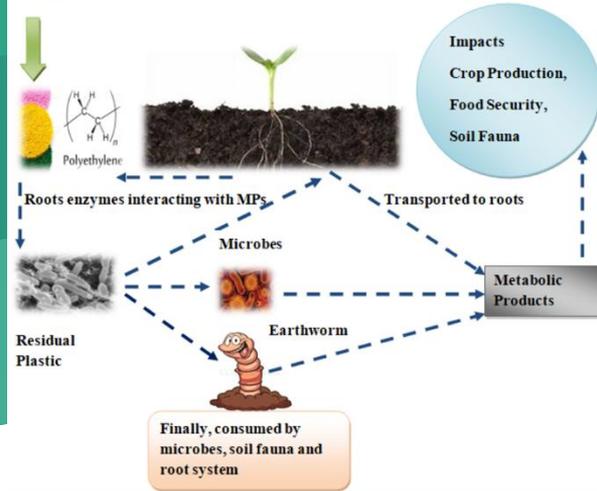
Other concerns:

- Reduced earthworms - they eat microplastics which abrade their digestive tracts making it more difficult to absorb nutrients.
 - Reduced effectiveness aerating soil.
 - Accumulate in plants through root systems, stems and leaves
 - Proliferate through trophic levels, i.e. bird eats an earthworm.or when a person eats an apple.
- Become a vector for environmental pollutants
- Ash from incineration



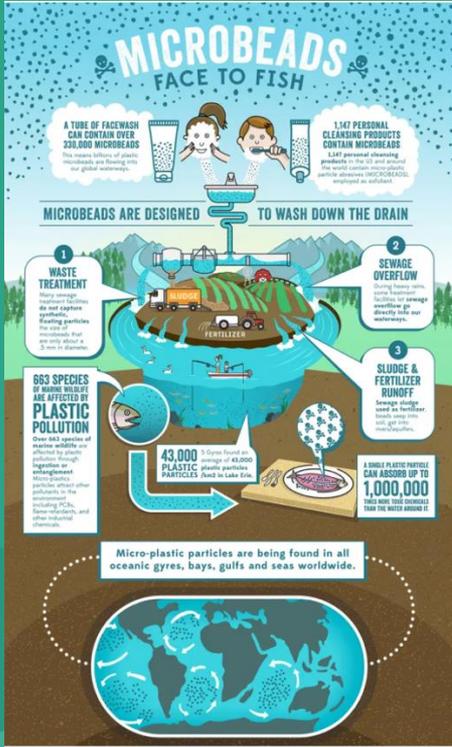
Microplastics can also enter agricultural soils through the degradation of plastic materials used by farmers, such as black plastic mulch. (Credit: Charles Dawley/flickr)

Microplastics

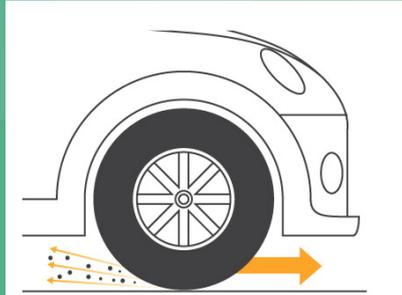


Microplastics

Global Impacts from Breaking Down



Microbeads in personal care products - Banned



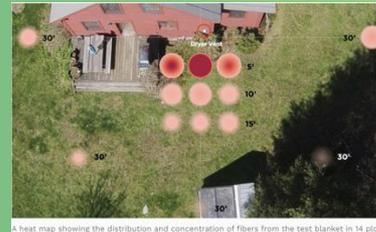
Did You Know?

As much as 28 percent of microplastics in the ocean comes from tires shedding synthetic rubber as they wear down.

Tire breakdown



Use of plastic in roads



Microfibers from clothes in dryers



Plastic pellets stick to the wall of a storm drain outside Chevron Phillips' plant outfall in Sweeny, Graham Smith

Nurdle spills

Plastic materials end up in our waterways

MICROPLASTICS IN THE HUMAN BODY

2023: TENS TO THOUSANDS OF NINE TYPES OF PLASTICS WERE FOUND IN TISSUE



HEART

2022: SIX PLASTIC PARTICLES WERE IDENTIFIED IN TISSUE FROM TWO PATIENTS WITH TUMORS



BRAIN

BREAST MILK



LUNGS



KIDNEY



SEMEN



LIVER



SCIENTISTS TESTED 62 WOMEN'S PLACENTAS, FINDING EVERY ONE CONTAINED SMALL PLASTIC PIECES



PLACENTA

2023: PLASTICS USED IN FOAM, PACKAGING AND PVC PIPES WERE FOUND



From ...



How much?



A credit card
a week
=
about 5 grams

Microplastics in our Diet

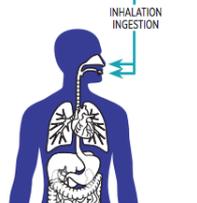
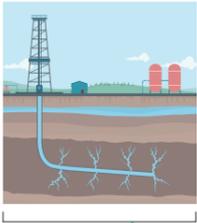


- Chemicals in plastics are known to mimic estrogen activity and linked to cancer, infertility, obesity, diabetes, and many other diseases
- Bisphenols, phthalates, and PVC act as endocrine disruptors
- Microplastics, microfibers and microbeads are tiny but huge problems
- American Academy of Pediatrics Policy and American College of Obstetricians and Gynecologists statement

Human Health Impacts

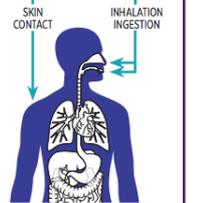
DIRECT EXPOSURE

Extraction & Transport



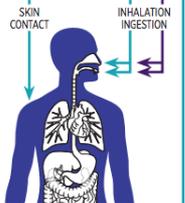
- **Emissions:** include Benzene, VOCs, and 170+ toxic chemicals in fracking fluid
- **Exposure:** inhalation and ingestion (air and water)
- **Health:** affects the immune system, sensory organs, liver, and kidney, impacts include cancers, neuro-, reproductive, and developmental toxicity

Refining & Manufacture



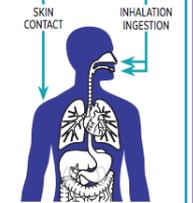
- **Emissions:** include Benzene, PAHs, and Styrene
- **Exposure:** inhalation, ingestion, skin contact (air, water, and soils)
- **Health:** impacts can include cancers, neuro-toxicity, reproductive toxicity, low birth weight, and eye and skin irritation

Consumer Use



- **Emissions:** include heavy metals, POPs, carcinogens, EDCs, and microplastics
- **Exposure:** inhalation, ingestion, and skin contact
- **Health:** affects renal, cardiovascular, gastrointestinal, neurological, reproductive, and respiratory systems; impacts include cancers, diabetes, and developmental toxicity

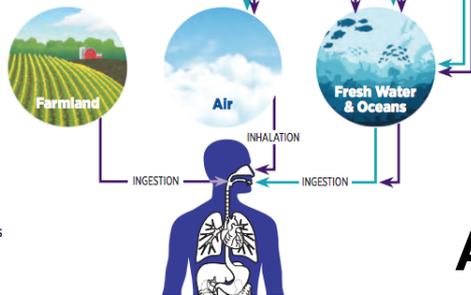
Waste Management



- **Emissions:** include heavy metals, dioxins and furans, PAHs, toxic recycling
- **Exposure:** ingestion and inhalation (air, ash, slag)
- **Health:** impacts include cancers, neurological damages, and damages to immune, reproductive, nervous, and endocrine system

ENVIRONMENTAL EXPOSURE

- **Microplastics** (e.g. tire dust and textile fibers) and **toxic additives:** including POPs, EDCs, carcinogens, and heavy metals
- **Exposure:** inhalation and ingestion (air, water, and food chain)
- **Health:** affects cardiovascular, renal, gastrointestinal, neurological, reproductive, and respiratory systems, impacts include cancers, diabetes, neuro-, reproductive, and developmental toxicity



KEY: → Microplastics → Chemicals

Source: © CIEL/NonprofitDesign.com

Summary of Health Concerns:

- **Extraction & Transport** – inhalation and ingestion from exposure to benzene, VOCs and 170+ toxic chemicals in fracking fluid – Affects – immune system, cancers, neural, reproductive and developmental toxicity.
- **Refining & Manufacture** – Benzene, PHAs and Styrene – cancers, neuro and reproductive toxicity, low birth weight, eye and skin irritation
- **Consumer Use** – heavy metals, POPs, carcinogens, EDCs and microplastics – affects renal, Cardiovascular, gastrointestinal, neurological, reproductive and respiratory systems resulting in cancers, diabetes, and developmental toxicity
- **Waste Management** – heavy metals, dioxins and furans, PAHs, toxic recycling – Results include cancers, damage to neurological immune, reproductive, nervous and endocrine systems
- **Environmental Exposure** from air, water and food chain – microplastics POPs, EDCs, heavy metals, carcinogens – Affect Cardiovascular, renal, GI, neurological, reproductive and respiratory systems – leading to cancer, diabetes, neurological, reproductive and developmental toxicity

Across the Plastic Lifecycle

Exposure to harmful chemicals used in plastic



Aug. 2018 **ACOG** - . . .” most pregnant women “are told little or nothing about reducing their exposure to chemicals despite evidence suggesting that ingredients in plastics, vehicle exhaust and cosmetics additives can have profound impacts on” the health of infants.



July 2018 **AAP** - Current requirements for a “generally recognized as safe” (GRAS) designation are insufficient to ensure the safety of food additives and do not contain sufficient protections against conflict of interest. . . .”



Dec. 2020 - **IPEN and Endocrine Society** - Plastics contain and leach hazardous chemicals, including endocrine-disrupting chemicals (EDCs) that threaten human health.



Health Expert Warnings



Known Health Challenges from EDCs

Co-morbidity with Covid-19 and Correlation with NCDs:

- Cardiovascular disease
- Diabetes – Type II
- Obesity
- Chronic respiratory disease
- Hypertension

IPEN and Endocrine Society Report – Dec. 2020

"Many of the plastics we use every day at home and work are exposing us to a harmful cocktail of endocrine-disrupting chemicals."

Proliferation of Plastic during Covid - NIH Study – Corona Virus Lives on Plastic for up to 3 days – industry exploitation – Plastic promoted as clean



The Climate Crisis

CIEL – “Nothing short of stopping the expansion of petrochemical and plastic production and keeping fossil fuels in the ground will create the surest and most effective reductions in the climate impacts from the plastic life cycle.”

Predictions from producing and incinerating plastic:

2019 - 850 million metric tons of plastic-related greenhouse gas (GHCs)
= 189 coal plant emissions.

2030 - 1.34 gigatons per year plastic-related GHG emissions
= 295 coal plants emissions.

2050 - 2.8 gigatons GHG emissions per year
= 615 coal plant emissions.



ReUse – Expansive efforts

National ReUse Network – sponsored by *UPSTREAM*



Ditching Disposables: Healthier Foodware in K-12 Schools and Dish Washing and Dish Machines in K-12 Schools
– developed by the *CENTER FOR ENVIRONMENTAL HEALTH*



Choose to ReUse - A Manual for Meals On Wheels Programs
- developed by *BEYOND PLASTICS* through their
Activist Network – local groups acting globally



Reusable Food Service Guide – **RETHINK DISPOSABLE**



Other Major Actions to Reduce Plastic

Legislative – U. S.

- Federal:

Break Free From Plastic Act – introduced to House and Senate – March 2021; 2023. Lowenthal and Merkley, Merkley and Huff

U. S. - Microbead-Free Waters

Act 2015 –

- **State** – Styrofoam, Bag bans but also **Bans on Bans (ALEC)**
- **Local** – Cities and school districts – regulations/ordinances for Plastic Bags, Nurdles, Microbeads, Microfibers, Styrofoam, plastic utensils, coffee cups and lids, stirrers, straws, food packaging

International:

Microbeads
Plastic bags
Micro-Fibers
Straws
EPR
Textiles

UN Global Plastics Treaty – next meeting Aug. 2025

Partial List

Businesses getting on board with no plastic

Eco Hotels through Orbitz –
no single-use plastic –
Evian
Norwegian Cruise lines
McDonalds
American Airlines
Guinness
Sodexo
Red Lobster
United Airlines
Carlsberg
Walt Disney Company

Nestle
Starbuck
Hyatt
Sea World
Method Cleaning Products
Clifbar
Kroger Super Markets
Marriott International
Delta Airlines
Whole Foods
IKEA
Ethique Beauty

Organizations working on Plastic Pollution



Partial list





Questions?

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