

A GUIDE TO MINIMIZING SINGLE-USE PLASTIC PRODUCTS

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EDUCATIONAL FILMS AND VIDEOS

BALI PLASTICS BAN (11 MINUTES)

https://www.ted.com/talks/melati and isabel wijsen our campaign to ban plastic bags in bali

LIVING PLASTIC FREE (12 MINUTES)

https://www.youtube.com/watch?v=3JXWRVrFiKs&feature=youtu.be

PREVIEW ON HOW THE FASHION INDUSTRY IS RESPONSIBLE FOR SO MUCH LAND- FILLED CLOTHING) 2.5 MINUTES

https://www.youtube.com/watch?

v=QPMU1VHgmEo&utm_campaign=website&utm_source=realityhub.climaterealityproject.org&utm_medium= email&app=desktop

TED TALK BY VAN JONES ON TEDXGREATPACIFICGARBAGE "THE ECONOMIC INJUSTICE OF PLASTICS" (12.32 MINS) https://www.ted.com/talks/van jones the economic injustice of plastic#t-648511

THE STORY OF PLASTIC (GREENPEACE) 4 MINUTES

videohttps://www.facebook.com/storyofstuff/videos/277990459744577/

ON E-WASTE (20 MINUTES)

https://www.fastcompany.com/90313043/how-design-led-to-overconsumption-and-how-it-can-help-stopit?

WHY I LIVE A ZERO WASTE LIFE (13.5 MINUTES)

https://www.youtube.com/watch?v=pF72px2R3Hg

ZERO WASTE IS NOT RECYCLING MORE, BUT LESS VIDEO (12.5 MINUTES)

https://www.youtube.com/watch?v=kWnsmzSSgdl

WRITTEN ARTICLES

AMERICAN CHEMICAL COUNCIL TERMINOLOGY AND IMAGES (WITH RECYCLING GUIDELINES) https://www.recycleandrecoverplastics.org/recycling-professionals/education/terms-tools/#pmtt_getTermsToolsPage

ARE YOU READY FOR ROUND 3 OF THE PLASTIC WASTE TRADE WAR?

https://www.greenbiz.com/article/are-you-ready-round-3-plastic-waste-trade-war?utm_source=newsletter&utm_medium=email&utm_content=2019-04-01&utm_campaign=greenbuzz&mkt_tok=eyJpljoiT0RJMFpHTmtZemRsWVdaailsInQiOiJsQUJ3RDEyNIV3SlpnRU9h

AVOIDING PLASTICS IN THE BATHROOM

https://treadingmyownpath.com/2019/06/27/waste-free-bathroom/

BPA IN CASH REGISTER RECEIPTS

https://www.consumerreports.org/cro/news/2014/03/the-health-risk-of-bpa-in-receipts/index.htm

CAN MUSHROOMS SAVE THE WORLD?

https://www.greenbatch.com/blog/2017/10/10/mushrooms-an-ecological-alternative-to-plastics

GUIDE TO ELIMINATING PLASTICS FROM THE KITCHEN, BATHROOM, NURSERY AND CLOTHES CLOSETS https://www.fastcompany.com/90312169/a-totally-achievable-relatively-painless-guide-to-cutting-plastic-out- of-your-life

GUIDE TO REUSABLE PRODUCE BAGS

https://treadingmyownpath.com/2018/07/05/reusable-produce-bag-guide/

GUIDE TO REUSABLE COFFEE CUPS

https://treadingmyownpath.com/2017/11/16/reusable-coffee-cups/

HOW MANY TIMES DO YOU HAVE TO REUSE AN ALTERNATIVE SHOPPING BAG?

https://www.nytimes.com/2019/03/29/climate/plastic-paper-shopping-bags.html? em_pos=small&emc=edit_clim_20190403&nl=climate-fwd&nl_art=3&nlid=77987432c% 3Dedit_clim_20190403&ref=headline&te=1

HOW THE U.S, RECYCLING SYSTEM IS BROKEN AND HOW TO FIX IT

https://www.fastcompany.com/90321566/all-the-ways-recycling-is-broken-and-how-to-fix-them

IMPACT OF CHINA BAN ON US RECYCLING PROGRAMS

https://www.vox.com/the-goods/2019/3/18/18271470/us-cities-stop-recycling-china-ban-on-recycles

LIFE WITHOUT PLASTIC

https://lifewithoutplastic.com/info/

NATGEO BLOG RELATED TO RANDY OLSON'S PHOTOS AND THE EFFORT

https://www.nationalgeographic.com/magazine/2018/06/editor-letter-plastic-planet-waste-pollution-crisis/

NATGEO PHOTOGRAPHER RANDY OLSON PRESENTATION TITLED "THE PLASTIC APOCALYPSE

http://www.frackcheckwv.net/2019/02/18/%E2%80%9Cthe-plastic-apocalypse%E2%80%9D-presentation-at-swickeley-pa-22019/

NATIONAL GEO ON OCEAN PLASTIC https://oceanconservancy.org/wp-content/uploads/2019/09/Final-2019-ICC-Report.pdf

NATIONAL GEO ON PLASTIC BOTTLES

https://www.nationalgeographic.com/environment/2019/08/plastic-bottles/

NATIONAL GEOGRAPHIC PLASTIC OR PLANET" MULTI-YEAR EFFORT https://www.nationalgeographic.com/environment/planetorplastic/

PLASTIC FREE ECO CHALLENGE

https://plasticfree.ecochallenge.org/about/resources

PSU E-COIN FOR REFUSING PLASTIC BAGS

https://news.psu.edu/story/564311/2019/03/19/impact/ecocoin-program-expanding-commonwealth-campuses

USING LESS PLASTIC

https://www.facebook.com/UsingLessPlastic/?_tn_=KH-R&eid=ARCGd3YuX-aetHgmz3lphfxliLx2QNmCHFAQZUwrrFWjj2K0JlOFRQkqNX6-PiUAA-H0NfmfpcRMs3Tc&fref=mentions&_xts_[0] =68.ARBqJUmV2pNL2wdZPji6LMkO4SgLYIX7NHCI6dZaB1gA-

tlO4ODtmDzEo9Cr5SzEl1dk- gD5rBYdNr3Au5sowtVlw9kXed92beZ2zRcxSDaRVm5DDfzGZKNob-VqRfHk92ZpfwyYwPQkfdizvZKR3mqqlfAGvkMl8bApq_AG2O2EtLleeYEPZcQosYae_RjnyUrXzRZEomZN4jJ2R

VqRfHk92ZpfwyYwPQkfdizvZKR3mqqlfAGvkMl8bApq_AG2O2EtLleeYEPZcQosYae_RjnyUrXzRZEomZN4jJ2RRGJ4l

H6hoZeb7nsKqp1lH4jQxrJC1mARnwPCj5m0hi08l0T45tKEoBF3ge6njjgyyMLOU8K6tNiVbF9iObGDZt7U5aOQbOjkXnrlQntCQywhVnflAdfETLMjaOyMrSzGog

WHAT CAN UNIVERSITIES DO?

https://universitybusiness.com/recycling-on-campus-affected-by-chinas-plastics-ban

FACTS ABOUT PLASTIC

GLOBAL FACTS

- Humans buy a million plastic bottles per minute.
- 91% of all plastic is not recycled.
- Over half a trillion plastic bottles will be sold in 2020.
- An estimated 50 percent of plastic consumed globally is single-use.
- Most plastic water bottles are made of PET plastic, or polyethylene terephthalate, which is made from crude oil and can take over 400 years to degrade.
- Approximately 8 million tons of plastic end up in the ocean each year.
- The Great Pacific Garbage Patch is an island of floating trash, more than twice the size of Texas, which lies between Hawaii and California. It contains more than 1.8 trillion pieces of plastic and weighs over 88,000 tons.
- By 2050, there will be more pounds of plastic in the ocean than pounds of fish.
- A recent study by Ghent University in Belgium found that people who regularly eat seafood ingest up to 11,000 tiny pieces of plastic each year.
- A study by Plymouth University found that one-third of all fish caught in the UK contained tiny pieces of plastic.
- A single plastic bag can take up to 1,000 years to degrade.
- Roughly 95% of the value of plastic packaging is lost after its first use, or \$120 billion globally.
- "Bioplastic" products are often made of PLA (polylactic acid), which comes from agricultural
 waste (sugar cane bagasse, corn starch, etc.) better than plastic because it's not derived from
 petroleum, but is not really biodegradable unless placed in an industrial composting system.
 "INGEO" and "Plantware" are two common brands.

USA FACTS

- 380 BILLION plastic bags and wraps are used by Americans use each year (EPA estimate).
- 7.6 BILLION pounds of disposable diapers are discarded each year in the U.S., according to the EPA.
- 2.8 BILLION pounds of plastic bottles were created in the U.S. in 2017; only 29.3% were recycled.
- Americans buy more than half a billion bottles of water every week. That's enough to circle the globe more than 5 times.
- Bottled water costs consumers 240 to 10,000 times more per gallon than tap water that is as good, or better.
- Each year, making the plastic water bottles used in the U.S. takes enough oil and energy to fuel a million cars.
- Plastic scrap exports to China plummeted from around 250,000 tons in the spring of 2017 to near zero in the spring of 2019.
- Overall, U.S. exports of plastic waste to all countries fell from 750,000 tons to 375,000 tons over the same period. Many plastic products in groups 3-7, the least recyclable types, are being sent to landfills.
- New York City residents use more than 10 billion single-use carryout bags every year and it costs

the City more than \$12 million annually to dispose of these bags. Consumers forget to bring their reusable bags to the store 40% of the time and opt for a single-use plastic or Paper bag instead.

PETRO-CHEMICAL INDUSTRY FACTS

- The petrochemical/plastics industry already accounts for nearly 7 percent of global greenhouse gas emissions; carbon emissions from the petrochemicals and plastics industry are expected to grow 20 percent by 2030. [IEA]
- Out of all of the plastic waste disposed up to 2015, only 9 percent of plastics were actually recycled. Seventy-nine percent is sent to landfills where it can be carried by wind and rain to pollute our broader environment, and the remaining 12 percent is incinerated. Burning plastic releases highly toxic dioxins into the air we breathe.
- Petrochemical sales are estimated to account for more than a third of all oil industry growth by 2030, and over half by 2050, with projections of sales for this purpose adding up to 7 million barrels of oil per day. Approximately 50% of all plastic is single-use, leading cities and countries to ban single use plastics entirely. These bans are estimated to reduce that demand for oil by 3 million barrels/day, making ethane cracker plants a much more questionable investment.
- Seven ethane cracker facilities located in close proximity to existing natural gas wells in the Ohio River Valley have been proposed since 2014. Construction has already begun on the Shell plant in Beaver County, Pennsylvania, with other potential facilities slated to be built in Parkersburg and Charleston, West Virginia; Calvert City, Kentucky; and Salem, Monroe County, and Belmont County, Ohio.
- In its full life-cycle, ethane cracking emits 840 kg of CO2 per ton of ethylene. The Shell plant in Beaver County is expected to produce 1.6 million tons of ethylene, resulting in 1.34 MMTCO2 emissions. This is equivalent to introducing over 290,000 cars on the road.

HOW SUSTAINABLE IS YOUR BAG?

Bag Type	Typ. Material Used	# times re-used to equal env. footprint of PRB (APPROXIMATE)
"PRB" Single Use "Plastic	#2 HDPE, 30% Recycled material	1
Retail Bag"		
Paper	100% recycled paper	3
	40% recycled paper	6
#4 LDPE Heavy duty bags)	Low Density Polyethylene	6
Non-woven PP	#5 polypropylene	11
Non-woven PP/LDPE	#5 polypropylene with #4 LDPE insert	21
Cotton	cotton	131
Hemp		?
Upcycled T-Shirt	cotton	?

Source: 2014 Clemson U. Life Cycle Assessment of Grocery Bags in Common Use in the United States

ALL ABOUT BIOPLASTICS

All About Bioplastics

TYPE of BIOPLASTIC	MADE FROM	MADE INTO	COMPOSTABLE?	BIODEGRADABLE?	RECYCLABLE?	IMPACT ON CARBON EMISSIONS*
BIOPLASTICS & BIO-BASED PLASTICS	BIOMASS - Renewable feedstock like waste sugar cane pulp, starch, fiber	PE (polyethylene) or PET (polyethylene terephthalate) -plastic bottles	NO	NO	YES	Carbon Neutral or carbon negative*
BIO-DERIVED POLYMERS	Mix of plant and FOSSIL FUEL feed- stock	PE (polyethylene) - Coca Cola's "Plant Bottle" is 30% plant, 70% fossil fuel, 100%	NO	NO	YES	INCREASES GHG's due to fossil fuel use
BIOPOLYMERS ¹	Made from plants (chitin, cellulose) or produced by bacteria	PLA (from plants), PHA (from bacteria)	ONLY IN INDUSTRIAL COMPOSTER	NOT IN SOIL or OCEAN; only in INDUSTRIAL SYSTEM	YES	Carbon Neutral or carbon negative*

^{*} Even though bioplastics and biopolymers may not biodegrade or be composted, being placed in a landfill would sequester the carbon contained in the material and therefore considered "carbon-negative". In all cases, however, the extent of fossil fuel use in manufacturing and transporting all plastic materials should be considered in estimating its impact on greenhouse gas emissions - making <u>reusable</u> products always preferable to single-use disposable products!

¹ Biopolymers made into PHA are often used to make utensils and plates that are much healthier to use than products made from PS (polystyrene) that can leach styrene and contain hormone disrupters. Biopolymers made into PLA are often used to make drinking straws, transparent cups and lids (brand names "INGEO" and "PLANTWARE" use PLA) and are also safer than items made from PS.

LIST OF ALTERNATIVES TO SINGLE-USE, DISPOSABLE PLASTIC PRODUCTS

Plastics	Alternatives to Disposable	Materials Used	Website Links
Category	Products	Waterials Osca	Website Links
General	Pgh. Store w/ variety of		https://www.facebook.com/OurChildre
	products		nOurEarth/
	East End Co-op (Grocery		https://www.eastendfood.coop/
	Store)		
	SING	LE-USE DISPOSABLE B	AGS
	Baggu reusable bag	40% recycled nylon	https://baggu.com/collections/reusabl
		sourced from pre-	<u>e-</u>
		consumer waste.	bags?source=pepperjam&publisherId=
			21181&clickId=2672023727
	ChicoBag PET VITA, Sling	Recycled disposable	https://www.chicobag.com/
	shopping bags	plastic bottles (PET)	
	Giant Eagle reusable bags (5 types)	Various plastics	
	Handy grocery shopping bag	High-grade PP and non-	https://tinyurl.com/42547smr
	that fits in shopping cart (Set	woven cloth with	
	of 2)	handles	
	Plant-based fabric bag	Cellulose sustainable	https://ragbags.com/
		wood fiber, corn-based PLA	
	Stasher bag	100% recyclable	https://www.stasherbag.com/
		Silicone	
	TerraCycle bags	recycled drink pouches	https://www.dwellsmart.com/collectio
			ns/reusable-bags
	Mesh produce bags	Organic cotton	www.purifyou.com
	Mesh produce bags	Food grade, BPA-free	https://earthsider.com/products/zero-
		mesh	waste-reusable-produce-bags-12pcs-
	Mesh produce bags	Food grade, BPA-free	test?fbaid=23843445164360409 www.purifyou.com
	iviesii produce bags	mesh	www.purityou.com
	Mesh produce bags	Food grade, BPA-free	https://www.amazon.com/Vandoona-
		mesh	Food-safe-Reusable-Mesh-
			Produce/dp/B07FT4ZCKZ

	Mesh produce bags	Food grade, BPA-free mesh	https://www.amazon.com/Vandoona- Food-safe-Reusable-Mesh- Produce/dp/B07FT4ZCKZ
	Mesh produce bags	Food grade, BPA-free mesh	https://www.amazon.com/Vandoona- Food-safe-Reusable-Mesh- Produce/dp/B07FT4ZCKZ
	PAPER, FIBER, S.S	S., GLASS LUNCH BOXI	ES, SNACK BAGS
	Reusable Lunch Bags	Various materials (paper, fiber- based, etc.)	https://www.amazon.com/stores/node/3034239011?_encoding=UTF8&field-lbr_brands_browse-bin=LunchSkins&ref_=bl_dp_s_web_3034239011
	Lunch containers & water bottles	Various materials	https://www.swellbottle.com
	Food Canister	Stainless steel	www.kleankanteen.com
	ECO lunch box	Stainless Steel Lunch Boxes w/ silicone lid	https://ecolunchboxes.com/collections/lunch-boxes
	Glass Salad Jars	Use widemouth glass canning jar	
	ChicoBag Snack Bags (Setof 3)	Recycled disposable plastic bottles (PET)	https://www.chicobag.com/product- snack-time-repete-17
	ChicoBag reusable water bottle sling	Recycled disposable plastic bottles (PET)	www.chicobag.com
Plastic Straws			
	Metal Straw	Stainless Steel	https://brandless.com/products/metal- straws?utm_source=impact&utm_cam paign=8771&utm_medium=10078&ut m_content=513280&clickid=2J8Xez3H1 xyJTNh0MvSyQWlBUklws126VRlyRs0&i rgwc=1
	Metal Straw	Stainless Steel	https://www.swellbottle.com/products/swell/accessories/stainless-steel-straw-set/
	SS telescoping straw	Stainless Steel	https://leafico.com/
	Compostable Straw	"Hyper Compostable" Seaweed	https://www.loliware.com/
	Metal Straw	S.S. straws with silicone tips & cleaning brush	www.kleankanteen.com
	S.S. straw with silicone tip	Stainless steel w/silicone tips	www.finalstraw.com

Strawbit Bracelet Straw	Silicone	https://strawbit.com/	
SINGLE-USE DISPOSABLE PLASTIC WATER BOTTLES & COFFEE CUPS			
Aluminum water bottles by the case	Aluminum		
Reusable water bottles	Various materials	https://www.swellbottle.com/shop/swell/travelers/	
Paper bottles	Paper	https://ecologicbrands.com/about/	
Recyclable, reusable "Bottles" 28% plant- based plastic	made of 54% paper and	https://www.shopjustwater.com/collections/demo-infused/products/just-water-24-pack?gclid=CjwKCAjw5fzrBRASEiwAD2OSV-f0A67bd7eP-WGoOvM8BhKbKJ44j1tHuPu Yj4jsI9PQF-XPtnqZ3xoCXFcQAvD BwE	
Insulated coffee cup mug tumblers	Stainless steel	www.kleankanteen.com	
Insulated bottles	Stainless steel	https://www.miir.com	
"StoJo" silicone collapsible travel cup	Silicone	https://stojo.co/	
"Hydaway" collapsible travel cup	Silicone	https://hydawaybottle.com/	
Wide mouth, fitness styles	BPA-free plastic	https://www.nalgene.com/	
Glass bottles	Glass with silicone carrier	www.purifyou.com	
YETI insulated bottles w/ hotshot lid	Stainless steel	https://www.yeti.com/en_US/insulate d-water-bottles	
Insulated bottles	Stainless steel	www.kleankanteen.com	
Insulated bottles	Stainless steel	https://www.hydroflask.com/	
Pocket-size expandable plastic coffee cup	BPA-free recycled plastic	https://pokito.net/	
PLASTIC TO-GO FOOD CONTAINERS, WRAPS, CELLOPHANE			
Food storage containers	Stainless steel	www.kleankanteen.com	
Food storage containers	Pyrex	https://www.pyrexhome.com/contact- us	
Food Wraps (cellophane replacement)	Bees wax	https://abeego.com/	
Food bags and wraps	Bees wax and organic cotton	www.shopetee.com	

Reusable lids	BPA-free food grade silicone	www.earthsider.com		
Stretch lids	Silicone	https://www.facebook.com/A-sustainable-You-1063659643832412/		
Stretch lids	Silicone	https://foodhuggers.com		
Food wraps	plant-based waxes & cotton- hemp	https://earthhero.com/products/travel/khala-cloths-khala-vegan-reusable-food-wraps-variety-pack/		
Eco-lids	food-grade silicon	https://earthandfriends.store/collections/home-kitchen/products/siliconelids		
Cellophane alternative	Wood pulp cellophane	https://www.google.com/search?client =firefox-b-1- d&q=wood+pulp+cellophane+packagin g		
FreshServe deli containers	bioplastics	http://www.biomasspackaging.com/brands/freshserve/		
Fresh fruit & vegetable wrapping	palm leaf	https://arekapak.de/		
Collapsible food containers	silicone	https://www.google.com/search?client =firefox-b-1- &q=collapsible+silicone+food+storage+ containers		
	PLASTIC DIXIE CUPS			
Kraft Paper Cups	Paper	https://www.restaurantware.com/disp osables/coffee-cups- accessories/coffee-cups/8-oz-kraft- paper-coffee-cup-double-wall-3-1-2-x- 3-1-2-x-3-1-4-25-count- box/?gclid=EAIaIQobChMIha7nmvCz- wIVscmUCR2J1AUOEAQYASABEgJL9fD BwE		
Ecotainer cups	Cellulose sustainable wood fiber	http://www.biomasspackaging.com/brands/ecotainer/		

PLASTIC BOWLS, PLATES, DINNERWARE, UTENSILS			
Bamboo Dinnerware	bamboo bowls and utensil sets	https://www.by-ekobo.us/our- brands/biobu-by-ekobo/gusto/gusto- 190-oz-large-salad-bowl	
Bamboo utensils, "full size" set	Bamboo utensil sets in RePETe utensil holders	https://www.facebook.com/OurChildre nOurEarth/	
Bamboo utensils in canvas holder	Bamboo	https://thesustainabletomorrow.com/collections	
Leafware	Fallen leaves	http://www.biomasspackaging.com/brands/leafware/	
Be Green containers	Renewable fiber	http://www.biomasspackaging.com/brands/be-green-packaging/	
Cutlery	Bioplastics	https://www.ecoproductsstore.com	
To-go containers and cutlery	Bioplastics	<u>www.ecoproducts.com</u>	
Food storage containers	Recycled #5 plastic	https://www.preserve.eco/products/fo od-storage-set-6-containers	
SYNTHET	TIC CLOTHING, ACTIVE WEAR, E	BACKPACKS, ETC.	
Sustainable clothing	Recycled disposable plastic bottles (PET)	https://repreve.com/brands	
Backpacks and activewear clothes	Recycled plastic bottles	https://threadinternational.com/	
PLASTIC PACKAGING MATERIALS			
	Palm leaf	https://holylama.co.uk/plastic-free- ayurvedic-soaps/	
	Paper	https://ecologicbrands.com/	
	Plant starch	http://www.greenlightpackaging.com/ our-products/biodegradable-loose-fill/	
	Mushroom	https://ecovativedesign.com/packaging	

	Seed Phytonutrients	https://blog.seedphytonutrients.com/b log/the-story-behind-the-beauty- industrys-most-eco-friendly-packaging		
	Wheatgrass-bagasse clamshells	https://greenpaperproducts.com		
	Loop/Terracycle reusable shipping containers	https://loopstore.com/		
	MAKE-UP			
Elate Cosmetics	Sustainable, plastic-free make-up	https://elatebeauty.com/		
Kjaer Weis	sustainably packaged make-up	https://kjaerweis.com/		
Antonym	Sustainable, plastic-free make-up	https://www.antonymcosmetics.com/		
Nudi Goods	Plastic free packaging for make-up and skincare	https://nudigoods.com/		
MISCE	MISCELLANEOUS AND PERSONAL CARE PRODUCTS			
Reusable jars, dispensers	Glass	https://www.grove.co/catalog/product/glass-dish-soap-dispenser/?v=3125&attrsrc=22&attrpg=catalog&attrpos=20		
Household cleaners	Natural materials	https://www.cleancult.com/#		
Household cleaners	Paper packaging, natural materials	https://www.blueland.com/		
Name tags	Compostable name tags			
Toothbrush	Bamboo	www.leafico.com		