

It's Not Just the Butts

The Environmental Consequences of Tobacco Products



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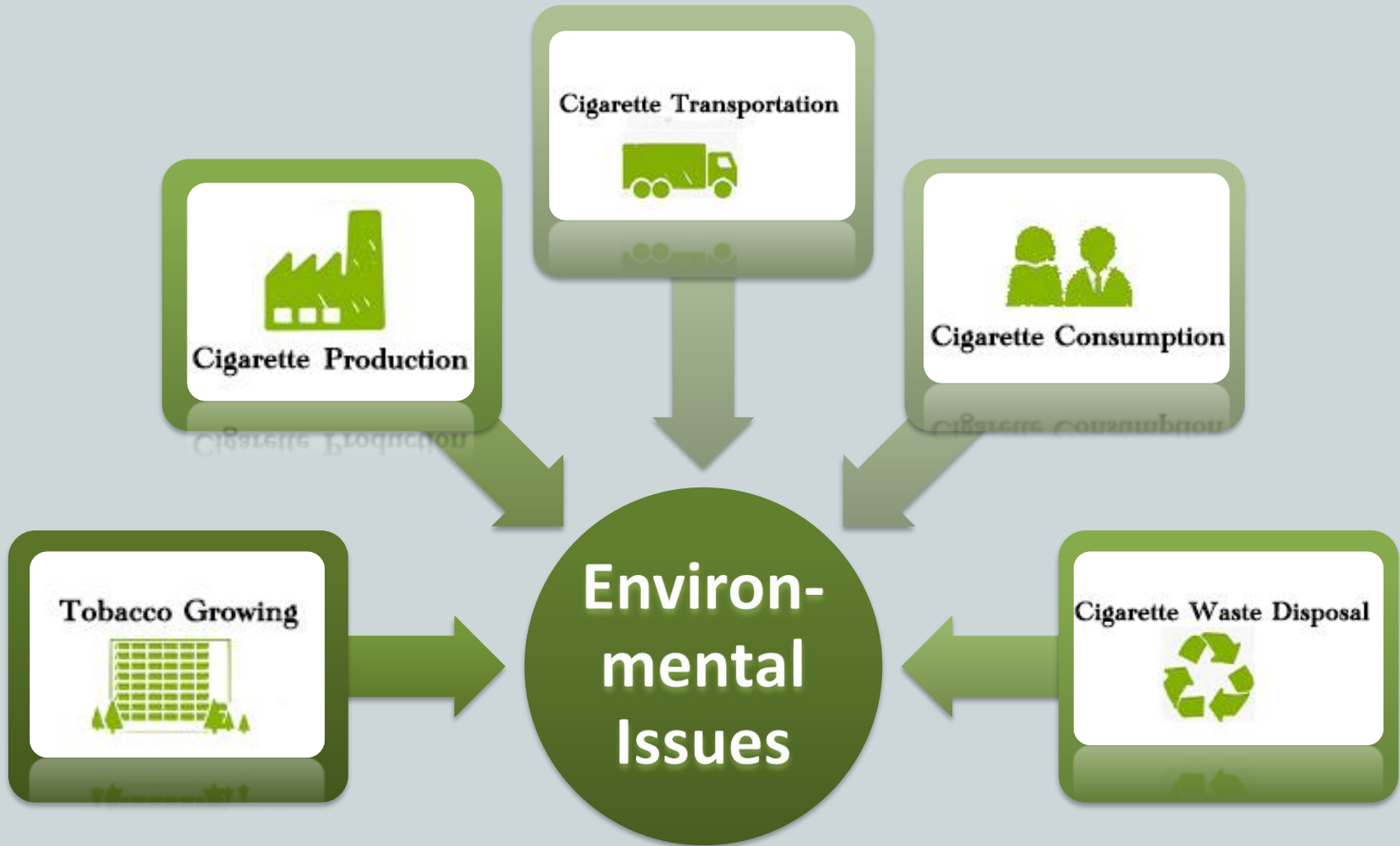
Center for Tobacco
and the Environment

The Tobacco Epidemic: Still with us

- Six Trillion cigarettes are smoked globally/year
- Millions of lives will be lost in this century due to tobacco use
- Trillions of butts and e-cigarettes dumped on streets, beaches, parks, and school grounds
- New and politically risky approaches will be needed to reduce the health and environmental impacts of global tobacco use.



Life Cycle of Tobacco



Tobacco Cultivation and Food Production



Land used for tobacco growing in 125 countries

→ **Decreases food output**

May impact hunger and economic status of small farmers in many developing countries

→ **Unfair market conditions for farmers**

Tobacco Cultivation and Risk to Farm Workers



→ **Child labor** and unhealthy working conditions

→ **“Green tobacco sickness”**:
Caused by skin absorption of nicotine from surface of harvested tobacco plants. Causes **nausea, vomiting, headache, dizziness, and severe weakness.**

Tobacco Cultivation and Deforestation



→ **200, 000** hectares of forests are cut down for tobacco farming and curing each year

→ **Climate change**

→ **Affects ecosystem services**
(inhibiting water recycling, triggering severe flooding, aquifer depletion, soil degradation, and loss of biodiversity)

Tobacco Cultivation and Pesticide Use



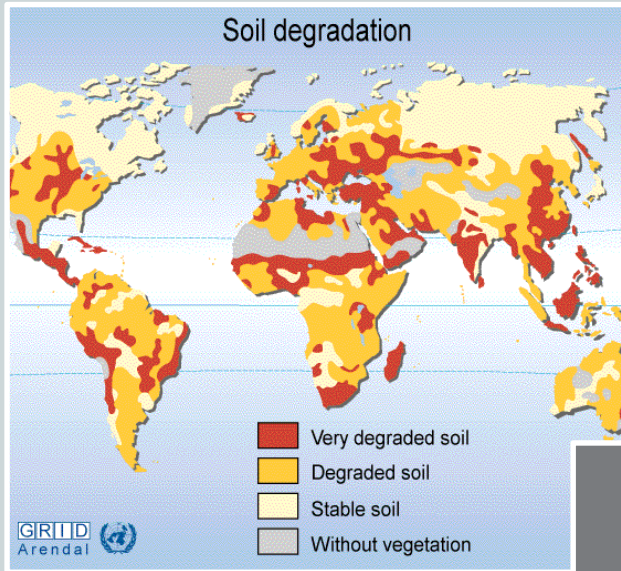
Tobacco cultivation involves significant pesticide use in all stages

→ **Accumulation of toxic chemicals in the environment, animals, and humans**

→ **Pollutes water and soil**

→ **Some pesticides (methyl bromide) even can cause ozone depletion**

Tobacco Cultivation and Soil degradation



**Deforestation + Intensive
pesticide use**

→ **Soil degradation**

Land will be more vulnerable to
desertification and unfit for
food production

Cigarette Production Waste



Cigarette factories produce **liquid, solid, and airborne waste products**, many of which are toxic

In one year, worldwide tobacco manufacturing produced 2.26 billion kilograms of solid waste and 209 million kilograms of chemical waste

Cigarette Production, Packaging, and Transport



Six trillion cigarettes
manufactured each year

→ About **2 million tons of packaging waste** (paper, ink, cellophane, foil, and glue)

→ Raw material and finished products trade globally, with transportation and distribution creating air pollution

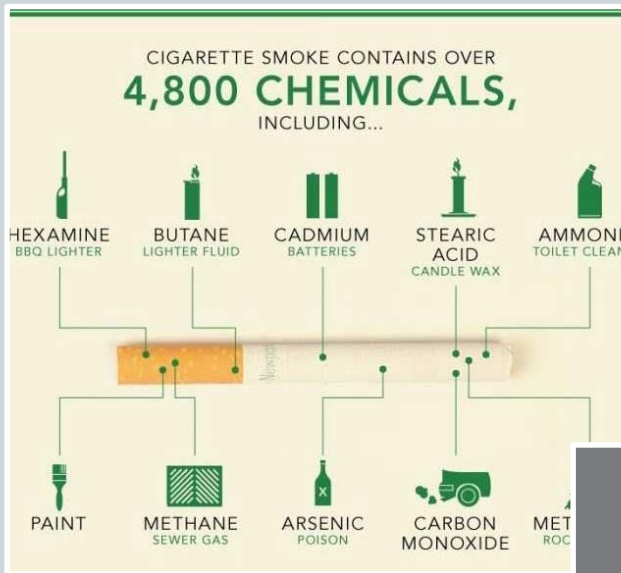
Smoking and Climate change



Smoking releases about 2.6 billion kilograms of **carbon dioxide** and 5.2 billion kilograms of **methane** worldwide every year

These greenhouse gases contribute to **climate change**

Smoking and Air Pollution



Second hand smoke contains more than **4,800 chemicals**, including nicotine, arsenic, benzene, formaldehyde, carbon monoxide

At least **50 chemicals** in secondhand smoke are known to be toxic or carcinogenic

Smoking and Fires



Cigarette butts and matches are a common cause of fire worldwide

- Emission of millions of tons of gases and particulate matters**
- Destruction of wildlife and vegetation**
- Fire caused deaths**

Tobacco Product Waste



**Cigarette filters are made from
cellulose acetate –poorly
degradable**

Although ultraviolet light will
eventually break down the filter,
the source becomes dispersed in
water or soil as microplastics

Tobacco Product Waste and the Environment



Street



Drains

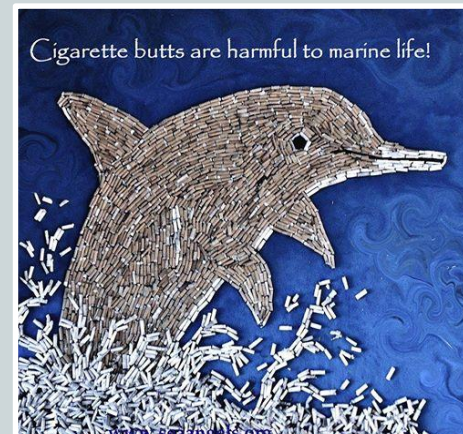


Coastal



Rivers

Ocean



Cigarette butts are harmful to marine life!

Top Ten Items Picked Up Over 27 Years of Coastal Cleanup

Item rank	Item	No. of Debris Items	Percentage of Total Debris Items
1	cigarettes/filters	52,907,756	32%
2	food wrappers/containers	14,766,533	9%
3	caps, lids	13,585,425	8%
4	cups, plates, forks, knives, spoons	10,112,038	6%
5	beverage bottles (plastic)	9,549,156	6%
6	bags (plastic)	7,825,319	5%
7	beverage bottles (glass)	7,062,199	4%
8	beverage cans	6,753,260	4%
9	straws/stirrers	6,263,453	4%
10	rope	3,251,948	2%
Top ten total debris items		132,077,087	80%
Total debris items worldwide		166,144,420	100%

Source: Ocean Conservancy, 2011

Tobacco Chemical Waste Toxicity



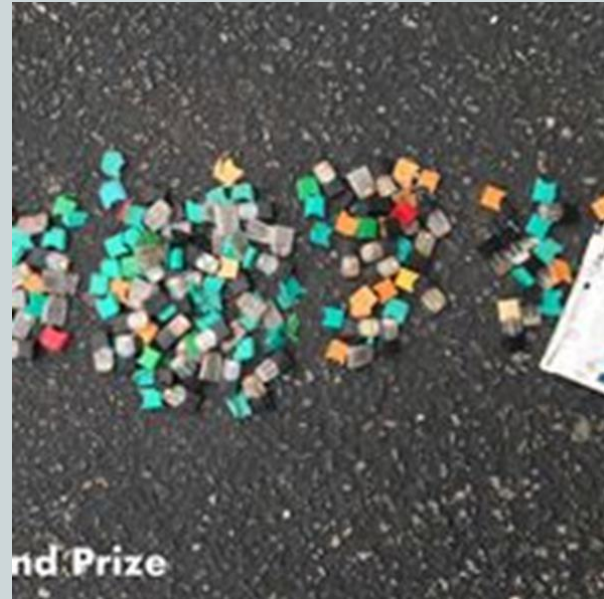
Hazardous chemicals such as nicotine, heavy metals, ethylene glycol leach from butts into the environment

➔ **Contaminates waterways and land**

Some chemicals bio-accumulate or bio-amplify in the food chain and may cause additional human health risks

E-Cigarette Waste

- **Electronic Cigarettes**
 - Single use plastic products, reservoirs, components: hazardous waste;
 - Littered e-liquid reservoirs a source of nicotine and other toxic chemicals;
 - Littered electronic components may leach metals into environment (lithium).



E-cigarette waste collected
From Bay Area middle and
high school grounds (MMWR 2020)

Tobacco Product Waste: Children, Wildlife, Pets



The cigarette butt itself is also hazardous when accidentally ingested by children, pets, or wildlife.

Nicotine is a pesticide!

Third Hand Smoke



Third Hand Smoke (THS)
contaminates indoor
environments long after
smoking has ceased

Toxins absorbed by small
children through skin

THS Causes DNA Damage in
laboratory animals

What can be done about tobacco product waste (TPW)?

- Local/state action:
 - Outdoor smoking bans and enforcement
 - Banning the sale of filtered cigarettes
 - Litter fees
 - Litigation
- National
 - FDA: Citizen petition to label filters as flavoring
- International
 - United Nations Environment Program Treaty on Plastic Pollution

Current TPW Mitigation Efforts

- Awareness raising for smokers and non-smokers
 - PR Campaigns
 - Social Media
 - Butt cleanups
- Banning outdoor smoking
 - Beaches, parks, restaurants, streets
- Anti-litter laws (fines of up to \$1000 per event)
- Take back and recycling (Terracycle)?
- Litter fees (San Francisco)



Extended Producer Responsibility and TPW

- Internalize environmental cost of products into price of cigarettes;
- Shift economic burden of away from government and taxpayers to producers;
- Provide incentives to producers to design products that minimize environmental harms
- Promotes total life cycle environmental protections, extending responsibilities of manufacturers to entire life cycle of product, and especially to take-back, recycling, and disposal.



INDUSTRY LIABILITY:
FINANCIAL, PHYSICAL, INFORMATIVE

Extended Producer Responsibility: Calculation of Per-Pack Maximum Permissible Litter Fee San Francisco, CA

Measure	Estimate
• Cigarette Packs Purchased in SF (2008)	30,611,026
• Total Litter Mitigation Costs (2009) ^a	\$7,487,916
• Total Litter Mitigation Costs Adjusted for In-migration (2009) ^b	\$6,649,270
• Total Litter Mitigation Costs per Pack (2009)	\$0.22
• Now, litter fee is \$1.51 per pack due to inflation, program costs increases, etc.	
• Funds cleanups, enforcement, administration, education	
• Administered by environment department	

Online Simulation Model of TPW Costs: 30 Largest US Cities

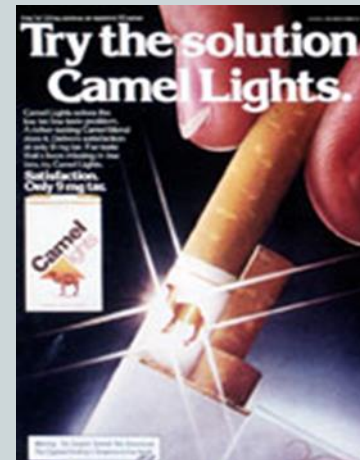
Table 3. Means and Confidence Intervals of Total Costs for All Cities based on Simulation Results.

City	Lower CL	Mean	Upper CL
New York	\$57,651,833	\$58,144,371	\$58,636,909
Los Angeles	\$19,536,484	\$19,703,611	\$19,870,738
Chicago	\$21,904,786	\$22,096,215	\$22,287,644
Houston	\$14,610,850	\$14,736,292	\$14,861,734
Philadelphia	\$15,031,508	\$15,160,748	\$15,289,988
Phoenix	\$9,497,792	\$9,579,344	\$9,660,896
San Antonio	\$8,983,848	\$9,060,898	\$9,137,948
San Diego	\$7,006,529	\$7,066,021	\$7,125,513
Dallas	\$8,281,272	\$8,352,924	\$8,424,576
San Jose	\$3,875,933	\$3,908,981	\$3,942,029
Indianapolis	\$5,659,452	\$5,707,744	\$5,756,036
Jacksonville	\$7,086,314	\$7,146,788	\$7,207,262
San Francisco	\$4,160,609	\$4,195,867	\$4,231,125

- John E. Schneider et al., "Online Simulation Model to Estimate the Total Costs of Tobacco Product Waste in Large U.S. Cities," *International Journal of Environmental Research and Public Health* 17, no. 13 (2020)

The Filter Fraud

- Main purpose of the cigarette filter for tobacco industry:
 - to lower the cost of manufacturing (cellulose acetate is cheaper than tobacco leaf);
 - to keep tobacco bits from entering the mouths of smokers;
 - to convince people into thinking that filtered brands were somehow 'safer' than unfiltered brands.
- 'Safer cigarette': Fraudulent marketing tool;
- Light, low tar terms now prohibited.



Filters as a Health Risk

2001 Natl. Cancer Institute Monograph 13

- “Epidemiological and other scientific evidence, including patterns of mortality from smoking-caused diseases, does not indicate a benefit to public health from changes in cigarette design and manufacturing over the last fifty years.”

2014 US Surgeon General’s Report

- “The evidence is sufficient to conclude that the increased risk of adenocarcinoma of the lung in smokers results from changes in the design and composition of cigarettes since the 1950s.”

Banning filters: A crazy idea?

Health Concern

- Filters have no health benefit
- They encourage people to start smoking and avoid quitting
- Like flavorings, they make smoking more palatable

Environmental Concern

- Non-biodegradable plastic
- Up to 65% of butts improperly discarded
- Accumulate in aquatic biomes
- Degrade communities
- Meet criterion for aquatic toxicity in lab

FDA Pre-emption of Local or State Filtered Cigarette Sales Prohibition?

- TCA preserved authority of state and local governments to adopt tobacco control laws regarding sale, distribution, possession, advertising, promotion, and fire safety.
- ‘Congress’s explicit decision to preserve for the states a robust role in regulating, and even banning, sales of tobacco products”
- Public nuisance caused by TPW may be a basis for litigation (Witkowski J. Tulane Env Law Rev 2014).

Tobacco Industry's Corporate Social Responsibility (CSR) Response

- Altria funds 29 US Environmental Groups
 - The Nature Conservancy
 - National Fish and Wildlife Foundation
 - Ocean Conservancy
 - American Rivers
 - Rainforest Alliance

- Keep America Beautiful



Generous support from Philip Morris USA over a three-year period made the research and development of the Guide to Cigarette Litter Prevention possible.



The Industry's Response:

CSR vs EPR

- Educate smokers ('accommodation')
- Pocket ashtrays
- Provide outdoor ashtrays and receptacles
- Sponsor anti-litter campaigns
- Avoid producer responsibility



*For '...adults over 21 who have been
brainwashed with environmental propaganda'*

-from "The Future of RJR Litter Initiatives" in 1996 (ard97c00)

Polluter Pays Litigation: Baltimore City Lawsuit, November 2022

- Lawsuit to hold five cigarette manufacturers and a distributor accountable for TPW cleanup costs and environmental damages
 - Cleanup costs borne by city (funds to clean streets, sidewalks, drains, and harbor)
 - Criminal penalties for each offense (past, present and ongoing) at maximum fine level
 - Punitive damages for the good of society and for deterrence of future crimes: ***“Defective product, failure to warn, criminal liability, public nuisance...”***
- Total remedy sought: USD\$150 million



Mr. Trashwheel: collected 12 million butts from Baltimore's Inner Harbor since 2014

Key Messages on Cigarette Filters for UNEP Treaty

- Cellulose acetate cigarette filters are the most common collected trash item globally, and they are toxic;
- Cellulose acetate filters have no health benefit and may be a health risk;
- Biodegradable filters will not diminish tobacco waste toxicity and will help sustain tobacco use;
- Recycling of plastic filters is NOT logistically, aesthetically, or economically feasible.



The upstream solution to the environmental harms of single use plastic cigarette filters is to ban the sale of filtered cigarettes.

Conclusions

- Tobacco is a full service hazard to human health and the environment
- The **costs of tobacco's environmental impacts** should be recouped **from the tobacco industry** (Extended Producer Responsibility)
- **Product sales regulation** can eliminate the plastic cigarette filter and reduce tobacco product waste (and probably cigarette use)
- **New partnerships** between environmental and public health groups are needed to reduce both environmental and health impacts of tobacco.

Need Clear Messages and Scientific Information



- *California Tobacco Prevention Program White Paper on TPW:*
<https://merg.sdsu.edu/tpwwp/>
- Novotny TE, Hamzai L. Cellulose acetate cigarette filter is hazardous to human health. *Tob Control*;18 April 2023. doi: 10.1136/tc-2023-05792
- United Nations Treaty on Plastics Pollution:
<https://ash.org/plastic-pollution/>