

The Pollution Playbook:

How Industry Blocks Regulation of Toxic Chemicals

Toxic chemical pollution is a global crisis.¹ More than 350,000 chemicals and mixtures have been identified in inventories across countries and regions,² and evidence shows that many industrial chemicals are harmful to human health.³ Despite increasing evidence of hazardous chemicals in the environment and in human bodies, there are many regulatory gaps.⁴ While there are many reasons for this, a major contributor to this regulatory gap is the deceptive tactics that manufacturers use to keep producing and selling their toxic products.

From tobacco to fossil fuels, from plastics to chemicals, there is a long history of corporate interests and their allies using deceptive tactics to avoid regulation of harmful products. Some of the most common tactics are as follows:⁵

- **Withholding damaging knowledge:** When internal company research reveals damaging information about their products, that information is often not shared with the public or regulators, or is actively hidden.⁶
- **Undermining independent science and conducting research that favors corporate interests:** Funding academics to promote industry-friendly findings;⁷ cherry-picking and amplifying friendly findings in public discourse or to influence legislative processes;⁸ critiquing the design of independent studies or reanalyzing data with new parameters to deliver results that support their products' safety claims;⁹ misanalyzing data in ways that

1. Organisation for Economic Co-operation and Development (OECD), *Environmental Outlook on the Triple Planetary Crisis: Stakes, Evolution and Policy Linkages* (OECD, 2025), 157, <https://doi.org/10.1787/257ffbb6-en>.

2. Zhanyun Wang et al., "Toward a Global Understanding of Chemical Pollution: A First Comprehensive Analysis of National and Regional Chemical Inventories," *Environmental Science & Technology* 54 no. 5 (2020), 2578, https://pubs.acs.org/doi/pdf/10.1021/acs.est.9b06379?ref=article_openPDF.

3. United Nations Environment Programme (UNEP), *Global Chemicals Outlook II: From Legacies to Innovative Solutions* (UNEP, 2019), 150–155, <https://www.unep.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions>.

4. UNEP, *Global Chemicals Outlook*, vii; United Nations Environment Programme (UNEP), *Global Framework on Chemicals – For a Planet Free of Harm from Chemicals and Waste* (UNEP, 2023), 5–8, <https://wedocs.unep.org/items/78b44b29-7325-4924-a16a-4bfl94ef64c9>.

5. Rebecca Goldberg and Laura Vandenberg, "The science of spin: targeted strategies to manufacture doubt with detrimental effects on environmental and public health," *Environ Health* 20 no. 33 (2021), 4–5 <https://pubmed.ncbi.nlm.nih.gov/33771171/>; Tess Legg et al., "The Science for Profit Model—How and why corporations influence science and the use of science in policy and practice," *PLoS ONE* 16 no. 6 (2021), 6–9, <https://doi.org/10.1371/journal.pone.0253272>.

6. Legg et al., "Science for Profit," 9; K. Michael Cummings et al., "The Cigarette Controversy," *Cancer Epidemiology Biomarkers and Prevention* 16 no. 6 (2007), 1071–1072, <https://aacrjournals.org/cebpa/article/16/6/1070/260310/The-Cigarette-Controversy>.

7. Carey Gillam, "Revealed: The secret push to bury a weedkiller's link to Parkinson's disease," *The Guardian*, June 2, 2023, 5–7, <https://www.theguardian.com/us-news/2023/jun/02/paraquat-parkinsons-disease-research-syngenta-weedkiller>.

8. Legg, "Science for Profit," 9.

9. Legg, 11.

produce misleading solutions;¹⁰ failing to disclose industry funding sources and conflicts of interest in academic research.¹¹

- **Pointing to “other causes” for harms:** Deflecting blame from a product or industry by citing other alternative causes for the negative impacts.¹²
- **Intimidating and targeting independent scientists:** Discrediting authors and harassing and intimidating scientists who publish studies that illuminate the health impacts of a specific industry product.¹³
- **Developing PR campaigns:** Spreading pro-industry messages to reframe the narrative around products.¹⁴
- **Using front groups:** Funding fake grassroots groups (a practice known as ‘astroturfing’) and recruiting participants to lend credibility to and promote industry-friendly narratives.¹⁵
- **Finding loopholes or cheating the system:** Identifying and exploiting loopholes in the law, deliberately circumventing regulations, or conspiring within the industry to avoid regulation.¹⁶
- **Emphasizing economic costs over all others:** Manipulating data to distort cost-benefit analyses, overestimating costs of regulations, and underestimating benefits.¹⁷

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10. Lianne Sheppard et al., “Flawed analysis of an intentional human dosing study and its impact on chlorpyrifos risk assessments,” *Environment International* 143 (2020), <https://doi.org/10.1016/j.envint.2020.105905>.
 11. “The Fossil Fuel Industry Hid the Truth about Its Funding of Fracking Research,” Union of Concerned Scientists, October 12, 2017, <https://www.ucs.org/resources/fossil-fuel-industry-hid-truth-about-its-funding-fracking-research>.
 12. Goldberg, “The Science of Spin,” 2.
 13. Margot Gibbs et al., “Poison PR,” Lighthouse Reports, September 27, 2024, <https://www.lighthousereports.com/investigation/poison-pr/>; Agathe Bonfour, “Manufactured Doubt – The plastics industry is taking lessons from Big Oil to undermine science,” SourceMaterial, November 27, 2024, <https://www.source-material.org/plastics-science-merchants-doubt-oil-tobacco/>.
 14. Zach Boren and Emma Howard, “Companies behind campaign to ‘end plastic waste’ produced 1,000 times more plastic than it cleaned up,” *Unearthed*, November 20, 2024, <https://unearthed.greenpeace.org/2024/11/20/alliance-to-end-plastic-waste-oil-chemical-exxon-shell-total/>.
 15. Kevin Grandia, “Leaked Memo: Oil Lobby Launches Fake ‘Grassroots’ Campaign,” *Desmog*, August 13, 2009, <https://www.desmog.com/2009/08/13/oil-lobbys-energy-citizens-astroturf-campaign-exposed-launch/>.
 16. US Environmental Protection Agency, “Volkswagen Violations,” last updated March 19, 2025, <https://www.epa.gov/vw/learn-about-volkswagen-violations>; “Bisphenol A in food containers: almost €20 million in fines,” *Autorité de la concurrence*, January 11, 2024, <https://www.autoritedelaconcurrence.fr/en/press-release/bisphenol-food-containers-almost-eu20-million-fines>.
 17. “Sabotaging EU Pesticide Reduction Law (SUR),” *Corporate Europe Observatory*, November 19, 2023, 8, <https://corporateeurope.org/en/2023/11/sabotaging-eu-pesticide-reduction-law-sur>; Ton van der Ham and Vincent Harmsen, “WUR admits: ‘Scientists should not have participated in pesticide lobby’,” *BNNVARA*, October 10, 2024, 9, <https://www.bnnvara.nl/zembla/artikelen/wur-erkent-wetenschappers-hadden-niet-mogen-deelnemen-aan-pesticidenlobby>.

When industry manufactures doubt, lobbies regulators and politicians, and wrongly presents its products as ‘safe’ to delay, limit, or impede regulations at the national, regional, or global level, it does so at the expense of human health and the environment.¹⁸

Companies often present themselves as essential partners in policymaking¹⁹ because they have unique access to the data on their chemicals and often claim ‘confidentiality.’²⁰ However, the historical record indicates a pattern of dishonest engagement in policy and regulatory processes through hidden data and manipulation or through attempts to discredit independent science that shows the harms of their products. Trade secrets and confidentiality must not be used as excuses to embed manufacturers and lobbyists in policymaking processes and decision-making bodies. Companies and their trade associations should not be able to influence policymaking for hazardous substances they manufacture or the wider chemicals policy landscape. Institutions need to develop strong conflict-of-interest policies to safeguard policymaking from vested interests.

The following four case studies illustrate some of the tactics as described above.

Case Studies

Withholding Knowledge: Per- and Polyfluoroalkyl Substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS, also known as ‘forever chemicals’) are a group of more than 10,000²¹ man-made chemicals whose defining property of ‘persistence’ derives from their strong carbon-fluorine bonds. Some PFAS have been identified globally as persistent organic pollutants (POPs) under the Stockholm Convention, while many others share similar persistence and concern but are not yet listed.²² PFAS have waterproof, greaseproof, and heatproof properties, making them widely used in industry and in professional and consumer products, from machinery to raincoats. But their cost to human and animal health, as well as the environment, is also huge, and some consider it “one of the most pressing public and environmental health problems of the modern world.”²³ It is likely that “additional environmental and human health concerns will be identified as research continues into this class of chemicals.”²⁴

18. Goldberg, “The science of spin,” 2.

19. “International negotiations,” European Chemical Industry Council (Cefic), March 27, 2025, <https://cefic.org/policy/international-negotiations/#h-science-policy-panel-nbsp-nbsp>.

20. Wang et al., “Toward a Global Understanding,” 2576.

21. “ECHA publishes PFAS restriction proposal,” European Chemicals Agency (ECHA), February 7, 2023, <https://echa.europa.eu/-/echa-publishes-pfas-restriction-proposal>.

22. “Overview,” Stockholm Convention on Persistent Organic Pollutants (POPs), accessed January 23, 2025, <https://www.pops.int/Implementation/IndustrialPOPs/PFAS/Overview/tabid/5221/Default.aspx>.

23. “Per and Polyfluoroalkyl Substances (PFAS),” UN Environment Programme, accessed November 25, 2025, <https://www.unep.org/topics/chemicals-and-pollution-action/pollution-and-health/persistent-organic-pollutants-pops/and>.

24. Ian T. Cousins et al., “The high persistence of PFAS is sufficient for their management as a chemical class,” *Environmental Science: Processes & Impacts* 12, (2020), 2308, <https://doi.org/10.1039/D0EM00355G>.

There is strong and growing evidence from independent scientists that the production of PFAS should be regulated and restricted. PFAS are highly problematic because of their common high persistence,²⁵ which provides a “sufficient basis for regulation.”²⁶ Certain PFAS have already been proven to be toxic and are associated with endocrine-disrupting effects, carcinogenicity, toxicity to reproduction, effects on the immune system, and on lipid metabolism.²⁷ Research also shows that PFAS pollution cannot be eliminated during key points of its lifecycle, neither during the manufacture²⁸ of some of the most controversial PFAS (e.g., fluoropolymers) nor at the end, during conventional incineration.²⁹ It is also clear that the costs of cleaning up PFAS from our bodies³⁰ or from the environment³¹ would be prohibitive. Besides, fully effective, scalable clean-up technologies are not yet available.

From the late 1990s, leading PFAS producers were forced to disclose toxicity information by US courts, but previously had hidden evidence for decades to evade and fight regulation.³² Academic analysis of previously secret documents from PFAS producers DuPont and 3M showed that by 1970, the companies knew these chemicals were “highly toxic when inhaled and moderately toxic when ingested.”³³ This was forty years before the public health community knew about the harms.³⁴ These documents also demonstrate that these manufacturers used “several strategies that have been shown common to tobacco, pharmaceutical and other industries to influence science and regulation — most notably, suppressing unfavorable research and distorting public discourse.”³⁵ As a result, regulatory action was significantly delayed.³⁶ Similarly, investigations have shown that Arkema, a major French chemical producer whose products include PFAS, had been aware of the dangers of PFAS since at least the late 1990s and could have limited their spread in the environment ten years before taking action.³⁷

25. Cousins, “High persistence of PFAS.”

26. Ian T. Cousins et al., “Why is high persistence alone a major cause of concern?” *Environmental Science: Processes & Impacts* 5 (2019), p781, <https://doi.org/10.1039/C8EM00515J>.

27. “Per-/polyfluorinated compounds,” Human biomonitoring for Europe (HBM4EU), accessed January 15, 2026, <https://www.hbm4eu.eu/hbm4eu-substances/per-polyfluorinated-compounds/>.

28. Joost Dalmijn et al., “Emission inventory of PFASs and other fluorinated organic substances for the fluoropolymer production industry in Europe,” *Environmental Science: Processes & Impacts* 2 (2024), <https://doi.org/10.1039/D3EM00426K>.

29. “Etude bibliographique sur la thermodégradation des PFAS [Literature review on the thermal degradation of PFAS],” L’Institut national de l’environnement industriel et des risques (Ineris), February 5, 2025, <https://www.ineris.fr/fr/etude-bibliographique-thermodegradation-pfas>.

30. Gretta Goldenman et al., “The cost of inaction: a socioeconomic analysis of environmental and health impacts linked to exposure to PFAS,” Nordic Council of Ministers (2019), 14 <https://norden.diva-portal.org/smash/get/diva2:1295959/FULLTEXT01.pdf>.

31. “The Bill,” The Forever Lobbying Project, last updated January 2025, <https://foreverpollution.eu/lobbying/the-bill/>.

32. Nina Gaber et al., “The Devil they Knew: Chemical Documents Analysis of Industry Influence on PFAS Science,” *Annals of Global Health* 89 no. 1 (2023), 2, <https://doi.org/10.5334/aogh.4013>.

33. Nina Gaber et al., “The Devil they Knew,” 9.

34. Gaber et al., “The Devil they Knew,” 1.

35. Gaber et al., “The Devil they Knew,” 1.

36. Gaber et al., “The Devil they Knew,” 2.

37. Emilie Rosso, “E. ENQUÊTE PFAS. Pollution et mise en danger de la vie d’autrui, comment l’industriel Arkema « prépare sa défense » depuis des années (2/3) [PFAS INVESTIGATION. Pollution and endangering the lives of others: how the industrial company Arkema has been “preparing its defense” for years (2/3)],” *France 3 Rhône-Alpes*, June 13, 2024, <https://france3-regions.franceinfo.fr/auvergne-rhone-alpes/rhone/lyon/enquete-pfas-depuis-des-annees-arkema-prepare-sa-defense-2-3-2985893.html>.

When the regulation of some PFAS became unavoidable, the industry funded its own science to justify its demands for exempting entire classes of PFAS from regulation. The Forever Lobbying Project — a cross-border, interdisciplinary investigation launched in 2025 — revealed the importance of two heavily cited scientific articles³⁸ whose authors were industry consultants or employees of fluoropolymer manufacturers. These articles have been used to back industry claims that fluoropolymers should be exempted from regulation because they are too large to penetrate cells or cause harm.³⁹ They claim that fluoropolymers are “Polymers of Low Concern (PLC)” according to criteria established by the Organization for Economic Co-operation and Development (OECD).⁴⁰ In reality, the OECD has never agreed on such criteria,⁴¹ and it can be argued that claiming otherwise was “potentially dishonest.”⁴²

As the European Environmental Bureau (EEB) reported in 2024, despite corporations being aware of PFAS’ persistence and their potential hazards, they “failed to adequately inform the public or regulators” and “significantly contributed to the uncontrolled spread of PFAS across various environments and populations.”⁴³ Today, despite the PFAS pollution crisis, regulation remains decidedly patchy. The Stockholm Convention, which regulates POPs, has helped to phase out some PFAS⁴⁴ after years of industry opposition. Yet after regulating one chemical, corporations will often replace it with similar PFAS or substances that break down into PFAS (a process known as ‘regrettable substitution’).⁴⁵

At the EU level, an attempt to develop a comprehensive restriction to cover almost all PFAS to avoid regrettable substitutions is underway.⁴⁶ However, the process has been met with multiple challenges that are weakening efforts to regulate and ban PFAS. There is evidence that the industry has privileged access to decision-makers,⁴⁷ it is promoting “misleading, fearmongering, exaggerated, or potentially dishonest” lobbying messages on science, alternatives, and the economy,⁴⁸ and it is pushing industry-derived ‘solutions’ to the PFAS pollution crisis.⁴⁹

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38. Barbara J Henry et al., “A Critical Review of the Application of Polymer of Low Concern and Regulatory Criteria to Fluoropolymers,” *Integrated Environmental Assessment and Management* 14 no. 3 (2018), 316-334, <https://doi.org/10.1002/ieam.4035>; Stephen H Korzeniowski et al., “A critical review of the application of polymer of low concern regulatory criteria to fluoropolymers II: Fluoroplastics and fluoroelastomers,” *Integrated Environmental Assessment and Management* 19 no 2, 326-354, <https://doi.org/10.1002/ieam.4646>.
 39. “The Disinformation Campaign,” The Forever Lobbying Project, accessed November 25, 2025, <https://foreverpollution.eu/lobbying/the-disinformation-campaign/>.
 40. “The Disinformation Campaign,” The Forever Lobbying Project.
 41. Stéphane Horel et al., “The Stress Test Methodology,” The Forever Pollution Project, January 14, 2025, <https://foreverpollution.eu/lobbying/the-stress-test-methodology/>.
 42. “The Disinformation Campaign,” Forever Lobbying Project.
 43. Olatz Finez Marañón et al., *From Risk to Resilience: Navigating Towards a Toxic-Free Future*, European Environmental Bureau, April 2024, 66, <https://eeb.org/library/from-risk-to-resilience-navigating-towards-a-toxic-free-future/>.
 44. “The new POPs under the Stockholm Convention” The Stockholm Convention on Persistent Organic Pollutants (POPs), accessed 22 January 2025, <https://www.pops.int/TheConvention/ThePOPs/TheNewPOPs/tabid/2511/Default.aspx>.
 45. Olasunkanmi Dosunmu et al., “The unintentional role of chemical regulation in regrettable substitution: The case of PFAS,” *Environmental Science and Policy* 174 (2025), <https://doi.org/10.1016/j.envsci.2025.104275>.
 46. Vicky Cann, *Chemical reaction: inside the corporate fight against the EU’s PFAS restriction*, Corporate Europe Observatory (January 2025), 8, <https://corporateeurope.org/en/chemical-reaction>.
 47. Cann, *Chemical reaction*, 22.
 48. “The Disinformation Campaign,” Forever Pollution Project.
 49. Cann, *Chemical reaction*, 23-25.

There are well-documented harms from PFAS, and decision-makers have a clear and urgent rationale to regulate them. Industry has a vested interest in defending business as usual. It has shown that it is willing to hide the truth, sponsor science, deploy misinformation and manipulative strategies, and fight regulatory and policy initiatives that could protect human health and the environment from the harm caused by their products.

Undermining Independent Science: Bisphenol A (BPA)

Bisphenols are a class of industrial chemicals used to produce polymers and resins.⁵⁰ Bisphenol A (BPA), perhaps the most well-known bisphenol,⁵¹ is an endocrine-disrupting chemical that interferes with hormone function.⁵² A major use of BPA is to make polycarbonate plastic, which is commonly used in food packaging, such as beverage bottles, and in coatings on metal cans.⁵³ It was first found to mimic estrogen in the 1930s,⁵⁴ and since then, many health effects have been documented, including, but not limited to, impacts on reproductive systems and metabolism.⁵⁵ BPA can also have neurodevelopmental⁵⁶ and immunotoxic effects, increase the risk of cardiovascular diseases and hormone-related cancers, and affect fertility,⁵⁷ and some effects can be transgenerational.⁵⁸ A 2020 review evaluating twenty years of BPA research found “overwhelming evidence of harm” to human health from exposure to BPA, including at low doses.⁵⁹ Additionally, a 2023 biomonitoring study found that 92% of adults across eleven European countries had BPA in their urine, indicating that it is likely present in most people.⁶⁰

50. “Bisphenols,” ECHA, accessed January 20, 2026, <https://echa.europa.eu/hot-topics/bisphenols>.

51. Jodi Flaws et al., “Plastics, EDCs, and Health: A Guide for Public Interest Organizations and Policy-Makers on Endocrine Disrupting Chemicals and Plastics,” (IPEN and The Endocrine Society, 2020), 44, https://www.endocrine.org/-/media/endocrine/files/topics/edc_guide_2020_v1_6chqennew-version.pdf.

52. Flaws et al., “Plastics, EDCs, and Health,” 18-19.

53. US Food and Drug Administration, “Bisphenol A (BPA): Use in Food Contact Application,” last updated April 20, 2023, <https://www.fda.gov/food/food-packaging-other-substances-come-contact-food-information-consumers/bisphenol-bpa-use-food-contact-application>.

54. Andreas Gies and Ana M. Soto, “Chapter 10 – Bisphenol A: contested science, divergent safety evaluations,” in *Late lessons from early warnings: science, precaution, innovation*, (Publications Office of the European Union, 2013), 20, <https://www.eea.europa.eu/en/analysis/publications/late-lessons-2>.

55. Miriam Meister, “Bisphenol A in low doses can affect the reproductive system and behaviour,” DTU Food Institute, April 19, 2016, <https://www.food.dtu.dk/english/News/Nyhed?id=ee009a3b-e421-4858-8be1-6103080a9978>.

56. Barbara Demeneix and Rémy Slama, *Endocrine Disruptors: from Scientific Evidence to Human Health Protection*, (European Parliament Policy Department for Citizen's Rights and Constitutional Affairs, 2019), 32, [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608866/IPOL_STU\(2019\)608866_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608866/IPOL_STU(2019)608866_EN.pdf).

57. European Environment Agency (EEA), “Human exposure to Bisphenol A in Europe,” September 13, 2023, <https://www.eea.europa.eu/en/analysis/publications/human-exposure-to-bisphenol-a>.

58. Jennifer T. Wolstenhome et al., “Transgenerational Bisphenol A Causes Deficits in Social Recognition and Alters Postsynaptic Density Genes in Mice,” *Endocrinology*, Volume 160, Issue 8, August 2019, 1858, <https://doi.org/10.1210/en.2019-00196>; David López-Rodríguez et al., “Multi- and Transgenerational Outcomes of an Exposure to a Mixture of Endocrine-Disrupting Chemicals (EDCs) on Puberty and Maternal Behavior in the Female Rat,” *Environmental Health Perspectives* 129 no. 8, August 2021, 15, <https://pubmed.ncbi.nlm.nih.gov/34383603/>.

59. Frederick S Vom Saal and Laura Vandenberg, “Update on the Health Effects of Bisphenol A: Overwhelming Evidence of Harm,” *Endocrinology* 162 no. 3 (2021), 18, <https://doi.org/10.1210/edocr/bqaa171>.

60. EEA, Human exposure to BPA in Europe.

The commercial interests behind BPA have gone on the defensive to contest the independent science that supports its regulation. For example, in the European Union, the European Chemicals Agency (ECHA) has added BPA to the candidate list of Substances of Very High Concern (SVHC), updating its listing at various stages to include its reprotoxic and endocrine-disrupting properties with probable serious effects to human health, and endocrine-disrupting effects on the environment. The European plastics industry trade association, PlasticsEurope, has sued ECHA over all three of these updates and has lost each time.⁶¹

In *PlasticsEurope v. ECHA* (Case T-636/17), a case heard before the General Court of the EU regarding endocrine-disrupting properties affecting humans, industry contested the scientific studies used in ECHA's decision in multiple ways. PlasticsEurope argued that some of the studies had been flagged by the European Food Safety Authority (EFSA) as having limitations or being unreliable.⁶² However, the EFSA assessment had a different scope — assessing risk related to a particular use rather than the substance's intrinsic hazards— so the claims of limitations were not relevant in the way PlasticsEurope argued.⁶³ They also claimed that certain studies were not given appropriate weight or taken into account, and that the studies did not support ECHA's conclusions.⁶⁴ The Court's judgment pointed out that numerous studies demonstrate adverse effects on hormone cycles, which the industry did not address in its complaint; that many of its criticisms had already been discussed in the review process for updating the listing of BPA; and that it did not contest those responses.⁶⁵

Still, some countries and political regions have successfully regulated certain applications of BPA, and others are in the process of doing so. For example, Canada, the United States, the EU, France, Sweden, Belgium, the South American Mercosur bloc, China, and South Korea have varying regulations of BPA in some or all food contact materials for babies and young children,⁶⁶ and the EU recently adopted a broader ban on BPA in food contact materials.⁶⁷ The United Kingdom is considering regulation, with its Food Standards Agency conducting a consultative process for a proposed ban on BPA and other bisphenols in food contact materials.⁶⁸ That said, many of the regulations are insufficient and limited in scope.

61. ClientEarth, "EU Court delivers final blow to plastics industry on BPA," March 9, 2023, <https://www.clientearth.org/latest/press-office/press-releases/eu-court-delivers-final-blow-to-plastics-industry-on-bpa/>.

62. Case T-636/17, *PlasticsEurope v. Eur. Chem. Agency (ECHA)*, ECLI:EU:T:2019:639, ¶¶ 45–47 (Sep. 20, 2019), <https://infocuria.curia.europa.eu/tabs/document?source=document&text=&docid=217994&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=15648547>.

63. *Id.* at ¶¶ 61–70.

64. *Id.* at ¶¶ 46–50.

65. *Id.* at ¶¶ 71–82.

66. Lindsey Parkinson, "Bisphenols," Food Packaging Forum, July 23, 2025, <https://foodpackagingforum.org/resources/background-articles/bisphenols>.

67. "EU prohibition on the use and trade of Bisphenol A from 20 January 2025," European Commission, March 7, 2025, <https://trade.ec.europa.eu/access-to-markets/en/news/eu-prohibition-use-and-trade-bisphenol-20-january-2025>; Lindsey Parkinson, "Bisphenols," Food Packaging Forum, July 23, 2025, <https://foodpackagingforum.org/resources/background-articles/bisphenols>.

68. "Consultation on the proposal to implement a ban on the use of bisphenol A (BPA) other bisphenols and bisphenol derivatives in food contact materials," UK Food Standards Agency, last updated October 2, 2025, <https://www.food.gov.uk/news-alerts/consultations/consultation-on-the-proposal-to-implement-a-ban-on-the-use-of-bisphenol-a-bpa-other-bisphenols-and-bisphenol-derivatives-in-food>.

BPA has also been a topic in the ongoing negotiations for a global plastics treaty. Multiple proposals for a global list of chemicals to regulate include BPA, and products containing BPA — specifically toys, children’s products, and food contact materials intended for children under the age of 3 — are also included in proposals to phase out a global list of products.⁶⁹ Each of these proposals and others attempting to ban the use of toxic chemicals in plastics were opposed by industry groups,⁷⁰ whose presence in the plastics treaty negotiations has been well documented.⁷¹

Establishing Front Groups: Benzene

Benzene, a chemical used in a wide variety of industrial applications,⁷² has long been known to present serious health impacts, with reports of benzene being linked to aplastic anemia (a serious blood condition⁷³) starting in the 1890s, and reports of links with leukemia as early as the 1920s.⁷⁴ There is now clear evidence of a causal association of benzene with myeloid leukemia and positive associations with other types of leukemia and other blood cancers.⁷⁵ Benzene is also genotoxic, meaning it damages DNA, with its main effects being clastogenicity (structural damage to chromosomes) and aneugenicity (abnormal chromosome numbers).⁷⁶

The International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) has classified benzene as Group 1 “carcinogenic to humans,” indicating sufficient evidence that it causes cancer in humans, and this classification has stood for decades.⁷⁷ In the EU, benzene is classified as a carcinogen 1A under the Classification, Labelling, and Packaging Regulation.⁷⁸ In the United States, it is regulated under the Clean Air Act as a ‘Hazardous Air Pollutant.’⁷⁹

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- 69. United Nations Environment Programme, “Compilation of draft text of the international legally binding instrument on plastic pollution, including in the marine environment,” UNEP/PP/INC.5/4 (July 9, 2024), 67-68, <https://wedocs.unep.org/items/d34b1a24-0ed4-46de-bd89-0094bf699ea6>; Switzerland, on behalf of a group of 85 countries, “Further development of Article 3 on Plastic Products,” August 10, 2025, https://resolutions.unep.org/incres/uploads/mex-swi_proposal_on_art_3_plastic_products_1.pdf.
 - 70. “Corporate Advocacy on the UN Global Plastics Treaty,” InfluenceMap, November 2024, <https://influencemap.org/briefing/Corporate-Advocacy-on-the-UN-Global-Plastics-Treaty-30143>; “Corporate Advocacy on the UN Global Plastics Treaty – 2025 Update,” InfluenceMap, December 2025, <https://influencemap.org/briefing/Corporate-Advocacy-on-the-UN-Global-Plastics-Treaty-2025-Update-33706>.
 - 71. “Fossil Fuel and Petrochemical Lobbyists Overrun Plastics Treaty Negotiations,” Center for International Environmental Law, August 7, 2025, <https://www.ciel.org/news/inc-5-2-lobbyist-analysis/>.
 - 72. UK Health Security Agency, “Benzene: general information,” last updated October 4, 2024, <https://www.gov.uk/government/publications/benzene-general-information-incident-management-and-toxicology/benzene-general-information>.
 - 73. “Aplastic anemia,” Mayo Clinic, May 3, 2025, <https://www.mayoclinic.org/diseases-conditions/aplastic-anemia/symptoms-causes/syc-20355015>.
 - 74. Peter F Infante, “Chapter 4 - Benzene: an historical perspective on the American and European occupational setting,” in *Late lessons from early warnings: the precautionary principle 1896-2000*, ed. Malcolm MacGarvin et al (Office for Official Publications of the European Communities, 2001), 38, https://www.eea.europa.eu/en/analysis/publications/environmental_issue_report_2001_22.
 - 75. “Committee for Risk Assessment RAC, Opinion on scientific evaluation of occupational exposure limits for Benzene,” European Chemicals Agency (ECHA), March 9, 2018, 6, https://echa.europa.eu/documents/10162/13641/benzene_opinion_en.pdf/4fec9aac-9ed5-2aae-7b70-5226705358c7.
 - 76. ECHA Risk Assessment Opinion, 8.
 - 77. World Health Organization International Agency for Research on Cancer (WHO IARC), “Benzene Volume 120,” in *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*, (IARC, 2019) 33, <https://publications.iarc.who.int/576>.
 - 78. ECHA Risk Assessment Opinion, 4.
 - 79. “Initial List of Hazardous Air Pollutants with Modifications,” US Environmental Protection Agency, last updated December 18, 2025, <https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications>.

Benzene is intricately linked to fossil fuels — it is found in petroleum products like gasoline and is released during the production of plastics.⁸⁰ While an American Petroleum Institute review from 1948 concluded that the “only absolutely safe concentration for benzene is zero,”⁸¹ the industry tried to limit the regulation of benzene, including through Conservation of Clean Air and Water in Europe (Concawe), a research group created in 1963 by oil companies “to carry out research on environmental issues relevant to the oil industry.”⁸² Concawe pushed against stronger occupational limits on benzene in Europe and attempted to influence the IARC’s classification of diesel exhaust as carcinogenic to humans and of ECHA’s risk assessment of benzene.

In 2017, Concawe commissioned a project to reanalyze data on benzene impacts at low exposure levels and submitted the results to ECHA. It excluded “critical data which made it impossible for them to observe the low-dose behaviour,” according to an environmental health expert.⁸³ This report was included in ECHA’s review, but in March 2018, the Risk Assessment Committee (RAC) ultimately recommended a limit of 0.05 ppm. During that process and after the recommendation was published, Concawe continued to push back against the EU scientific body’s conclusions by sending a letter to the RAC chair in November 2017 expressing their concerns, and proposing instead a limit of 0.5 ppm for three years and 0.25 ppm thereafter in a March 2019 position paper followed by an April 2019 meeting with a body of the European Commission.⁸⁴ The EU ultimately agreed to almost exactly this proposal, adopting exposure limits of 0.5 ppm from April 2024 to 2026, and a slightly stricter 0.2 ppm limit afterward. The European Commission presented this as “the most balanced option between adequate protection of workers at the EU level and prevention of closure and other severe disadvantages for the industries.”⁸⁵ More than anything, this illustrates the role and power of front groups and the industry’s disinformation strategies in undermining policies and regulations that seek to protect human health and the environment.

Combining Disinformation Strategies: Pesticides

There is a broad scientific consensus that pesticides play a key role in the decline of insects, including pollinators vital to our food supply.⁸⁶ Across the many classes of pesticides, industry actors have employed a range of tactics to ensure their products remain on the market.

80. David Azoulay et al., *Plastic and Health: The Hidden Costs of a Plastic Planet* (Center for International Environmental Law, 2019), 18–19, <https://www.ciel.org/plasticandhealth/>.

81. “Toxicological Review: Benzene, Department of Safety,” American Petroleum Institute, September, 1948, 4, <https://www.documentcloud.org/documents/1373098-00010795/?mode=document>.

82. Concawe, “Who are we,” accessed December 8, 2025, <https://www.concawe.eu/who-are-we/>.

83. “Uncovered: how a research group created by BP, Shell and ExxonMobil undermined European laws designed to protect people from cancer risks,” Transport & Environment Europe, November 29, 2023, <https://www.transportenvironment.org/articles/how-concawe-a-research-group-created-by-bp-shell-and-exxonmobil-undermined-european-laws-designed-to-protect-people-from-fossil-fuel-emission-linked-cancer-risks>.

84. Transport & Environment Europe, “Research group created by BP, Shell and ExxonMobil.”

85. Transport & Environment Europe, “Research group created by BP, Shell and ExxonMobil.”

86. Simon G. Potts et al., *Summary for policymakers of the assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production* (IPBES, 2016), 10 (point 14), <https://zenodo.org/records/2616458>.

In particular, the neonicotinoid group (also known as neonics or NNIs), one of the world’s most widely used insecticides, has been in the spotlight. Neonicotinoids target the central nervous systems of insects and are commonly used as systemic treatments, including seed coatings. As the plant gradually takes up the insecticide, insects are continuously exposed. In the EU, the first neonicotinoid insecticide to receive authorization was in 2005.⁸⁷ By 2012, new scientific evidence led the European Commission to request EFSA to look into the risks associated with the use of clothianidin, imidacloprid and thiamethoxam on bees.⁸⁸ Studies also pointed to human-relevant harms from these substances.⁸⁹

In 2013, the EFSA issued a Guidance Document on the risk assessment of the effects of pesticides on bees (the “Bee Guidance Document”)⁹⁰ and a Scientific Opinion in which EFSA concluded⁹¹ that three neonicotinoids (clothianidin, imidacloprid, and thiamethoxam) posed serious risks to bees.⁹²

In response to the EFSA Opinion on the three neonicotinoids, Syngenta, the developer and a major producer of thiamethoxam,⁹³ called for a review. In a 2012 letter to the European Commission,⁹⁴ the corporation claimed neonicotinoids “do not damage the health of bee populations,” even though EFSA’s Bee Guidance Document was based on numerous studies published before that year. Bayer, another chemical company that produces neonicotinoids,⁹⁵ commissioned its own review of EFSA’s Opinion by “an independent panel of bee scientists.” In reality, the scientists were part of a panel composed by product defense company Exponent.⁹⁶ According to David Michaels, professor in the Department of Environmental and Occupational Health at George Washington University, corporations hire product defense companies to help them create scientific uncertainty about potential harm caused by their products.⁹⁷ Exponent claimed EFSA “overstates the risks to honey bees” and pointed to causes other than pesticides, such as “inadequate hive maintenance.”⁹⁸ This review was accompanied by a massive lobbying campaign by producers Bayer and Syngenta, as well as a threat of legal action from Syngenta.⁹⁹

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87. “Neonicotinoids,” European Commission, accessed January 23, 2026, https://food.ec.europa.eu/plants/pesticides/approval-active-substances-safeners-and-synergists/renewal-approval/neonicotinoids_en.
 88. “Statement on the findings in recent studies investigating sub-lethal effects in bees of some neonicotinoids in consideration of the uses currently authorised in Europe,” EFSA, June 2012, 2 <https://efsa.onlinelibrary.wiley.com/doi/pdf/10.2903/j.efsa.2012.2752>.
 89. Jean-Marc Bonmatin et al., “An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides,” *Environmental Science and Pollution Research* 28 (2021), 11712, <https://link.springer.com/article/10.1007/s11356-021-12853-6>.
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 91. “EFSA identifies risks to bees from neonicotinoids,” European Food Safety Authority (EFSA), January 16, 2013, <https://www.efsa.europa.eu/en/press/news/130116>.
 92. “Neonicotinoids,” European Commission.
 93. “Thiamethoxam,” American Chemical Society, October 6, 2012, <https://www.acs.org/molecule-of-the-week/archive/t/thiamethoxam.html>.
 94. “Letter to Commissioners: Sustainable intensive agriculture- EFSA review on neonicotinoid risks to bee health,” Syngenta, November 21, 2012, https://corporateeurope.org/sites/default/files/letter_from_syngenta_to_commissioners_maire_geoghegan-quinn_and_dacian_ciolos_21st_november_2012.pdf.
 95. Bayer, Neonicotinoids: Bayer’s Systematic Risk Management & Portfolio Evolution, (Bayer, 2025), 5, <https://www.bayer.com/sites/default/files/bayer-neonicotinoids-report-2025-4-15-final.pdf>.
 96. “Letter to EFSA: EFSA peer review of the pesticide risk assessment,” Bayer, 41.
 97. David Michaels, Mercenary Science. A Field Guide to Recognizing Scientific Disinformation (American Educator, Winter 2021-2022), <https://www.aft.org/ae/winter2021-2022/michaels>.
 98. “Letter to EFSA: EFSA peer review of the pesticide risk assessment,” Bayer, 42.
 99. “Pesticides against pollinators,” Corporate Europe Observatory, April 11, 2013, <https://corporateeurope.org/en/agribusiness/2013/04/pesticides-against-pollinators>.

The EU finally banned the three neonicotinoids imidacloprid, clothianidin, and thiamethoxam for all outdoor uses in the EU in 2018.¹⁰⁰ However, the ban is consistently undermined¹⁰¹ through a loophole that allows national derogations. In a similar vein, EFSA’s Bee Guidance Document (published in 2013) has seen many delays in implementation. Croplife Europe¹⁰² wrote to the European Commission, opposing the Document for its “unrealistic level of conservatism,”¹⁰³ and several EU countries blocked its implementation, repeating industry arguments.¹⁰⁴ Corporations now call for even more industry involvement¹⁰⁵ “at all stages” of development of EU Guidance documents.

Another strategy emerged when Dow and Bayer launched two new insecticides, sulfoxaflor and flupyradifurone, on the EU market. These chemicals have the same mode of action as neonicotinoids, but in 2012,¹⁰⁶ Dow and Bayer created two new categories of insecticides to portray them as different. The two chemicals have been banned in France since 2018¹⁰⁷ due to their neonicotinoid-identical mode of action. In contradiction to scientific evidence, Bayer continues to market and praise flupyradifurone pesticides¹⁰⁸ for their “environmental friendliness to honeybees and bumble bees and to most beneficial insects.”

A key element in some pesticide companies’ strategies to get their products authorized is frequent attempts to ignore or disqualify independent, peer-reviewed evidence from regulatory assessment,¹⁰⁹ leaving only — or mostly — industry science to be considered.¹¹⁰ For instance, authorities use the Klimisch reliability score¹¹¹ to assess the reliability of toxicology studies. This system was developed by three BASF employees and has been used to dismiss independent studies.¹¹²

100. “Neonicotinoids,” European Commission.

101. “Banned pesticides still widely used: How EU Member states abuse emergency authorisations,” PAN Europe, January 12, 2023, <https://www.pan-europe.info/press-releases/2023/01/banned-pesticides-still-widely-used-how-eu-member-states-abuse-emergency>.

102. The European Crop Protection Association (ECPA) changed its name to Croplife Europe in 2021. “2021: A pivotal year for CropLife Europe,” Croplife Europe, December 2021, <https://croplifeeurope.eu/a-pivotal-year-for-croplife-europe/>.

103. “Letter to the European Commission: Review and update of the EFSA Bee Guidance Document,” European Crop Protection Association (now Croplife Europe), June 16, 2017, https://croplifeeurope.eu/wp-content/uploads/2020/12/28136_Letter_to_DG_SANTE_on_the_ECPA_proposal_for_a_protective_and_workable_EU_Bee_Risk_Assessment_.pdf.

104. “Chapitre 3 (2016-2019),” in *Le dernier souffle d’un projet de protection des abeilles [The final gasp of a bee protection project]*, Pollinis, accessed November 20, 2025, <https://www.pollinis.org/enquete/le-scopaff-contre-les-abeilles-histoire-dun-scandale-environnemental-europeen/le-dernier-souffle-dun-projet-de-protection-des-abeilles/>.

105. Open Letter of Business and Agri-Food Industry stakeholders on the need for a high-performing EFSA to boost the competitiveness of the EU agri-food sector, May 28, 2025, https://croplifeeurope.eu/wp-content/uploads/2025/05/Open-industry-letter-on-better-EFSA-performance_FINAL.pdf.

106. “Sulfoxaflor and flupyradifurone: Neonicotinoids or not?” Pesticide Action Network (PAN) Europe, September 2016, https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/factsheets/201609%20Factsheet%20What%20is%20a%20neonicotinoid_Flupyradifurone_Sulfoxaflor_EN_PAN%20Europe.pdf.

107. Bonmatin et al, “WIA on systemic insecticides,” 11712.

108. “Let’s Talk About Flupyradifurone,” Bayer, last updated November 24, 2023, <https://www.bayer.com/en/agriculture/lets-talk-about-flupyradifurone>.

109. “Missed and Dismissed,” PAN-Europe and Générations Futures, 2014, <https://www.pan-europe.info/old/Resources/Reports/PANE%20-%202014%20-%20Missed%20and%20dismissed.pdf>.

110. Helmut Bartscher, “They ‘didn’t even read’ the glyphosate studies,” interview by Fabian Schmidt, Deutsche Welle, March 23, 2017, <https://www.dw.com/en/european-regulators-didnt-even-read-risk-studies-on-monsanto-pesticide-glyphosate/a-38087834>.

111. Claire Robinson et al, “Achieving a High Level of Protection from Pesticides in Europe: Problems with the Current Risk Assessment Procedure and Solutions,” *European Journal of Risk Regulation* 11 (2020), section II.2., <https://www.cambridge.org/core/journals/european-journal-of-risk-regulation/article/achieving-a-high-level-of-protection-from-pesticides-in-europe-problems-with-the-current-risk-assessment-procedure-and-solutions/1162DF6B1E3DF00FB801F484FD3ADB91>.

112. “Ensuring a higher level of protection from pesticides in Europe: The Problems with Current Pesticide Risk Assessment Procedures in the EU — and Proposed Solutions,” (Citizens for Science in Pesticide Regulation, 2018), 32, https://www.pan-europe.info/sites/pan-europe.info/files/public/resources/reports/White%20Paper_Dec2018.pdf.

Some pesticide companies have even been demonstrated to try to influence regulatory scientific assessments by ghostwriting studies (a tactic considered scientific fraud). Three notable examples of ghostwriting relate to Monsanto and glyphosate (the active ingredient in RoundUp). In 2000, a safety evaluation and risk assessment of RoundUp and glyphosate was published in the journal *Regulatory Toxicology and Pharmacology* found that “there is no indication of any human health concern.”¹¹³ Known as the Williams, Kroes, and Munro paper, it was cited as evidence of glyphosate’s safety for two decades and underpinned numerous regulations, even after a 2017 lawsuit uncovered internal emails suggesting that Monsanto employees ghostwrote the piece.¹¹⁴ The paper was finally retracted in 2025¹¹⁵ following a scientific paper by Kaurov and Oreskes. However, as pointed out by these authors, retracting the article “would not erase twenty-five years of influence.”¹¹⁶ There is evidence that a second review paper, published as ‘Kier & Kirkland 2013,’ was also partially ghostwritten, and, as of publication, this paper has not been retracted.¹¹⁷ In Kier & Kirkland, internal company emails and documents show that a Monsanto employee was originally listed as an author and then removed prior to publication.¹¹⁸ This same tactic was repeated in another glyphosate paper focusing on reproductive impacts, in which a Monsanto employee was removed from the list of authors.¹¹⁹

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- 113. [RETRACTED] GM Williams et al, “Safety evaluation and risk assessment of the herbicide Roundup and its active ingredient, glyphosate, for humans,” *Regulatory Toxicology and Pharmacology* 31 no. 2 Pt 1 (2000), abstract, <https://pubmed.ncbi.nlm.nih.gov/10854122/>.
 - 114. Alexander A Kaurov and Naomi Oreskes, “The afterlife of a ghost-written paper: How corporate authorship shaped two decades of glyphosate safety discourse,” *Environmental Science and Policy* 171 (2025), <https://doi.org/10.1016/j.envsci.2025.104160>.
 - 115. “Glyphosate safety article retracted eight years after Monsanto ghostwriting revealed in court,” Retraction Watch, December 4, 2025, <https://retractionwatch.com/2025/12/04/glyphosate-safety-article-retracted-elsevier-monsanto-ghostwriting/>.
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 - 118. “Screening of new Monsanto Papers,” Corporate Europe Observatory.
 - 119. Carey Gillam, “Decades of Deceit,” presentation to a European Parliament hearing, October 11, 2017, slide 6., https://www.europarl.europa.eu/cmsdata/129120/PH%20Glyphosate_Gillam.pdf.

Conclusion and Recommendations

Assessing the risks and preventing harm to human health and the environment from chemicals are at the heart of chemical management. Historical evidence shows that many companies that manufacture these chemicals downplay, misrepresent, or manipulate the scientific information on their products' hazards to resist or delay regulation. Protecting health and the environment requires taking this established fact into account and acting upon it.

To that end, corporations manufacturing, placing on the market, selling, using, and trading regulated substances (especially chemicals, pesticides, and plastics) that can cause environmental and or health harm should be banned from participating in regulatory processes. These companies and their trade associations should not be able to influence policymaking for hazardous substances they manufacture or the wider chemicals policy landscape. While they should be able to participate in public consultations or hearings or respond to official requests for information on their products, they should not be able to privately lobby policymakers, offer hospitality, or enjoy other behind-the-scenes access. This approach would not be unprecedented. After finding that the tobacco industry consistently undermines public-interest decision-making on health, public health officials acted, and the WHO adopted rules to help ensure that the tobacco industry is not involved in public health policy.¹²⁰

To enforce this, it is essential that there are clear conflict-of-interest rules and procedures for policymaking and scientific spaces at the international, regional, and national levels. Public authorities should also implement transparency regulations requiring disclosure of any lobby meetings held with the chemical industry. Crucially, officials must urgently establish strong, well-funded, properly independent scientific channels that will form the basis of decision-making on chemical regulation, to avoid reliance on industry-provided data.

^{120.} World Health Organization (WHO), Guidelines for implementation of Article 5.3, FCTC/16.1 (January 1, 2013), <https://fctc.who.int/resources/publications/m/item/guidelines-for-implementation-of-article-5.3>.

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