

A stylized map of New York State is shown in the background, rendered in shades of green and blue. Overlaid on the map is a thick green road with white dashed lines, which curves from the bottom left towards the center of the state. At the end of the road is a large green arrow pointing upwards and to the right.

# NEW YORK STATE'S ENVIRONMENTAL HEALTH LEADERSHIP

**A ROADMAP TO TURN OFF THE TAP ON TOXIC CHEMICALS  
AND BUILD A SUSTAINABLE, JUST, CIRCULAR ECONOMY**

Clean and Healthy New York  
January 2019

## ACKNOWLEDGEMENTS

Clean and Healthy New York gratefully acknowledges the following people and organizations for their role in making this Roadmap a reality:

For writing and research: Bobbi Wilding, MS and Kathleen Curtis, LPN

For research: Peter Bocala, Kayla Eason, Rich Schiafo, Erica Sullivan

For organizing our series of regional meetings around New York State: Siobhan Burke

For layout and graphic design: Elizabeth Ahearn

For input: please see Appendix A

This Roadmap was made possible with support from the New York State Health Foundation, the Passport Foundation, and the Marisla Foundation.

## TABLE OF CONTENTS

<b>Acknowledgements .....</b>	<b>2</b>
<b>Executive Summary.....</b>	<b>5</b>
The Problems .....	5
We need New York’s Leadership .....	5
The Landscape.....	6
four primary routes To achieve New York’s leadership .....	7
Key state policy actions .....	7
<b>Introduction .....</b>	<b>8</b>
Chemicals Can Harm Our Health and Environment .....	9
Why We Need New York State’s Leadership .....	10
Expanding the Frame.....	12
<b>Landscape.....</b>	<b>14</b>
Government.....	14
Federal Laws and Regulations .....	14
New York State.....	21
Pollution Prevention.....	26
Environmental Justice.....	28
Environmental Protection Fund.....	28
Action on Chemicals .....	30
Attorney General .....	32
Comptroller.....	33
Lessons from Local Government .....	33
Lessons from the Marketplace .....	34
Business Certification.....	36
Product Certification .....	36
Tools to Help Businesses .....	38
State Investment in Green Businesses .....	38
Effective Public Interest Engagement.....	39
Collaboration .....	39
Academic Institutions .....	39
Lessons from Other States.....	41
Inspiration and Opportunity All Around: Global Action.....	42

United Nations Sustainable Development Goals.....	42
European Action on Harmful Chemicals.....	43
Circular Economy .....	44
<b>The Roadmap for New York State .....</b>	<b>45</b>
The Four Major Roads to Environmental Health Leadership .....	45
Advancing Down the Road: Key Leading Constituencies .....	46
Public Transit.....	46
Freight Vehicles.....	46
Buses .....	46
Ambulances.....	47
Bikes .....	47
Walkers and Wheelers.....	47
<b>Transparency.....</b>	<b>48</b>
Actions: .....	48
Urgent Policy Action for .....	49
<b>Action on Harmful Chemicals and Their Classes .....</b>	<b>50</b>
Actions .....	50
Urgent Policy Action for .....	52
<b>Innovation of Inherently Safer Options.....</b>	<b>53</b>
Urgent Policy Action for .....	55
<b>Integration of Chemical Concerns into Sustainability and the Circular Economy.....</b>	<b>56</b>
Urgent Policy Action for .....	57
<b>Appendices.....</b>	<b>58</b>
Appendix A: Charting the course – the Making of the Roadmap.....	58
Appendix B: Organizations in the JustGreen Partnership.....	59
Appendix C: Federal Laws.....	60
Appendix D: Other States’ Chemicals Policy .....	61
<b>REFERENCES.....</b>	<b>63</b>

## EXECUTIVE SUMMARY

Everyone needs a healthy environment in order to thrive. After recognizing (often, too slowly) the harm human activity has on the planet and human health, people have created government infrastructure to phase out toxic chemicals and address our legacy of pollution. Some businesses have also led the way, at times based on the interests of their founders or leaders, or often due to advocacy and pressure from customers and public interest organizations.

## THE PROBLEMS

We now know that chemicals that make up products in our daily lives can have profound, often lifelong, impacts – contributing to cancer, diabetes, heart disease, infertility, birth defects and other health problems for people, poisoning waters for aquatic life, and warming the planet's atmosphere.

We live on a finite, fragile planet. We recognize that change is necessary to ensure a sustainable future for our children, grandchildren, and all life on the planet. We need to transition from the linear model of resource use: extraction, transportation, manufacturing, transportation, use, transportation, and disposal as waste. In this Roadmap, we share a new vision for meeting our needs – a rapid transition to a nontoxic, sustainable, and socially just circular economy. Without a switch to nontoxic materials, even with a circular economy, we will continue circulating chemicals that harm human health and the environment. Without a recognition that our transportation and energy systems must not contribute greenhouse gases to the atmosphere, our climate will further destabilize and none of our efforts will be sustainable. Without ensuring that all people are valued and protected from harm and allowed to thrive, any economy will ultimately destabilize as those it harms and diminishes, resist it. Without the fundamental shift to treating all materials as future inputs, rather than ultimate wastes, we will exhaust our resources.

## WE NEED NEW YORK'S LEADERSHIP

Although federal laws already enacted represent real progress to protect workers, people, communities, and the environment, special interests often weakened them or prevented their full implementation. In the current administration, industry representatives aren't just lobbying from the outside, they've been appointed to major leadership positions within key agencies, resulting in repeated rollback efforts. Here are some prime examples:

**Exceptions:** Due to our dependence on fossil fuels, they are treated differently from other toxic chemicals, even though they pose significant toxicological threats. For example, natural gas production wastes are exempted from handling under the Resource Conservation and Recovery Act.

**Burden of Proof:** Under the Toxic Substances Control Act, the US Environmental Protection Agency must prove to a very high bar that chemicals already in commerce are harmful. Even when there is credible scientific evidence, EPA must demonstrate that the harm outweighs the economic benefit to the industry in question for its use. EPA was unable to ban asbestos for those reasons.

**The Risk Paradigm.** Under the current risk-based construct ensconced in federal law, for which leading chemical makers and trade associations lobby intensely, each use of a chemical is assessed for the amount of a chemical that poses an acceptable risk of harm. This is hard and expensive to do, as there are many variables, both regarding chemicals and their toxicity, and how a person might inhale, ingest, or absorb them, and when. This allows ongoing production of known harmful chemicals. Instead, understanding a chemical's hazard profile and that of alternative options can drive product manufacture toward lower toxicity.

## THE LANDSCAPE

The federal government has enacted major legislation to address the consequences of harmful chemicals in our economy. Due to public pressure, the Clean Air Act, the Clean Water Act, programs to clean up hazardous waste sites and other environmental protection laws, had lofty goals, some of which were realized, and some of which were not. The current administration has made at least 78 distinct efforts to roll back environmental protections of air, water, and land, though some were stopped in the courts due to state and public interest organizations' actions. The federal government also has now-outdated laws and regulations addressing chemicals in food, drugs, and cosmetics.

New York State has enacted laws that implement or go beyond federal laws to address environmental and public health concerns. The State has invested in broader toxic waste cleanup efforts through several programs, not just the federal Superfund. It has enacted restrictions on chemicals of concern, often as the first or among the first states to do so. It has created and resourced the Environmental Protection Fund and expanded funding within it for Environmental Health and Justice. Some of these laws are not fully implemented to ensure a clean and healthy environment for all, and there is opportunity to do more. The State invests heavily in the "innovation economy" and can also play a greater role in integrating forward-thinking green chemistry and engineering into those innovations.

New York's businesses have resources to help them change current processes or develop new, creative solutions. The State allows company to incorporate as "benefit corporations" – folding social and environmental considerations alongside profit as primary goals of the corporation, and more companies are taking advantage of that designation. Companies can turn to the Pollution Prevention Institute for support of different projects that solve the problems driving pollution, rather than simply address end-of-pipe cleanup.

We have a robust community of academic institutions that conduct research into safer materials and chemistry, and who teach students how to consider those factors. From Long Island to Buffalo, they offer research and innovation, strengthening our state's ability to lead the way on environmental health. Still, there is room to grow, and it will be worth engaging schools across the state to incorporate toxicology and alternatives assessment capacity in their curriculum for all students, not just those with a specific interest.

The solutions to the problems that face us with regards to recycling, plastic pollution of the oceans, and harmful chemicals in our bodies arrive at one conclusion: we need to fundamentally shift our approach.

In this Roadmap, we will always concentrate on driving toward a nontoxic, sustainable, socially just, circular economy. In a circular economy, we will stop introducing chemicals that harm human health and the environment and switch to nontoxic materials, ensuring all people are valued and protected from harm and allowed to thrive. The fundamental shift to treating all materials as future inputs, not simply as ultimate wastes, will preserve our irreplaceable resources.

## FOUR PRIMARY ROUTES TO ACHIEVE NEW YORK'S LEADERSHIP



**Transparency:** Throughout the supply chain, purchasers including individuals need to know what is in the materials they buy so they can choose the healthiest option.



**Action** on harmful chemicals and their classes: When credible information indicates that chemicals are hazardous, government and businesses should act to limit their presence.



**Innovation** of inherently safer options: Investment in green chemistry and engineering, identifying solutions built on inherently benign, reusable, repairable, recyclable materials.



**Integration** of chemical considerations into broader definitions of sustainability: The petrochemical industry drives production of gases disrupting our climate, plastic pollution crowding the oceans, and toxic chemicals spreading from the equator to the poles. All rely on the same feedstock. We can only fully transition from a linear supply chain to a circular one when we detoxify the materials within it.

## KEY STATE POLICY ACTIONS

**1: Transparency:** The Governor and Legislature must pass budget legislation requiring full disclosure of chemicals present in all consumer products and their health hazards, as introduced in the Fiscal Year 2019-2020 Executive Budget.

The Attorney General must vigorously defend the cleaning product ingredient disclosure from the lawsuit filed by the companies that do not want to provide full information about their products.

**2: Action** on harmful chemicals and classes: The Governor and Legislature must pass new legislation requiring full disclosure of chemicals present in all consumer products, particularly those to which a pregnant woman or child may be exposed, including what hazards such chemicals may pose to public health and the environment.

**3: Innovation:** The Legislature should codify the State's Green Procurement program, and the Governor should draft a Green Chemistry Executive Order, integrated with other State environmental and energy goals (see Route 4 below).

**4: Integration:** The Governor should fold together State action on environmental priorities by weaving together materials concerns, (now under Executive Order 4), green innovation (such as a new Green Chemistry Executive Order above) and climate and energy (now Executive Order 66).

## INTRODUCTION

We all want a healthy environment. Numerous Federal, State, and Local laws, regulations, agency directives, and other policies have as their purpose the achievement of that universally held goal. Unfortunately, it is increasingly apparent that, despite these numerous policies, our environment is not getting healthier overall.

The health impacts of climate disruption, greedy natural resource abuses, environmental racism, and inadequate chemicals management and innovation all contribute to this downward spiral. Toxic chemical production is on the rise, in terms of both number and volume. According to the European Chemical Industry Council, global sales of the chemical and materials industry is expected to grow from US\$3.91 trillion in 2016 to US\$7.25 trillion in 2030,<sup>1</sup> a staggering 85% increase.

Efforts to regulate chemicals include disclosure and reporting of their use, storage, release, transport, and disposal. There are infrequent, limited chemical restriction policies, which often immediately result in the substitution of an equally hazardous, structurally similar, yet less well-studied unregulated replacement. Given the tens of thousands of chemicals in commerce, and the complexity of achieving scientific certainty as to the health and environmental risks they pose, there is no foreseeable end in sight without a paradigm shift in how our society regulates chemicals.

### About New York State

*(Most information comes from the NYS Department of Health Vital Statistics of 2016)*

NYS population<sup>2</sup>: 19,745,289      New York City population: 8,537,673 (43% of State).

Nearly 4 million people: 20% are under 18 years of age. 70% are white, 19% are Hispanic or Latinx, 18% are black, and 9% are Asian.

14% of New Yorkers live in poverty. 12.5% of New York households face food insecurity. 7% of New Yorkers lack health insurance.

28% of New Yorkers are not fully immunized.

In their lifetime, asthma<sup>3</sup> affects 13.9% of NY children overall and affects 24.7% of African American children.

Of the 2.63 million public and charter school students<sup>4</sup> (Pre-K through high school), 465,590 receive special education support. 339,956 preK-12 students receive support for diagnosed autism, learning disabilities, intellectual disabilities, and speech and language impairments, or 13% of the total public school population.<sup>5</sup>

In 2016, of the roughly 150,000 New Yorkers who died:

- 28.5% died of heart disease.
- 22.8% died of cancer.
- Causes ranked 3-5 were accidents, respiratory disease, and stroke, totaling 13.3%.

111,951 New Yorkers were diagnosed with cancer in 2015.<sup>6</sup> This translates to 482 cases per 100,000 people – the fourth highest incidence rate in the nation.

Over a million living New Yorkers have been diagnosed with cancer. The top three kinds of cancer diagnoses were breast, lung, and colorectal, which also led cancer deaths.



## CHEMICALS CAN HARM OUR HEALTH AND ENVIRONMENT

Industrial chemicals associated with profound health problems pervade our environment and daily lives. Every day, we are exposed continuously without our knowledge or consent. We wake up after spending eight hours on a mattress that may contain antimony, formaldehyde and flame retardants. We walk across flooring that may contain phthalates, lead or cadmium. We perform our morning ablutions with shampoo, toothpaste, deodorant and other personal care products that may contain parabens, methylene chloride, glycols and sodium benzoate, with water that may be contaminated with chlorine, heavy metals, and other toxic compounds. We don clothing that may contain alkylphenols, heavy metals, and chlorobenzene, washed in detergents that may contain 1,4 dioxane, sodium lauryl sulfate, and nonylphenol ethoxylate. We eat breakfast with intentionally-added toxic ingredients like sodium benzoate and butylated hydroxolene, as well as production, processing and packaging contaminants such as metals, bisphenols, phthalates, and per- and polyfluorinated chemicals. This exposure all occurs before we even leave the house. Toxic chemicals are not restricted for these uses, nor is disclosure of their presence required by law. Despite one's most informed, diligent efforts, it simply is not possible to get through the day without exposure to them.

There is a strong, established connection between certain chemicals and diseases and disorders such as cancer, infertility, obesity, learning and developmental disabilities, diabetes, and heart disease. Evidence of the harm from chemicals of concern manifests over time, and is difficult to trace to a single exposure pathway. There is a number of environmental contributors to cardiovascular disease, the top cause of death in New York and worldwide. These include lead, arsenic, and other metals, and particulate air pollution.<sup>7</sup> According to the President's Cancer Panel appointed by George W. Bush, environmentally caused cancers are "grossly underestimated" and 'needlessly devastate American lives.' Cancer is the second most common cause of death. Surely if these and other diseases and disorders of environmental origin are man-made, it is within our power to decrease and eventually eliminate them.

---

Chemistry contributes to virtually every aspect of modern life and the chemical industry supports more than 25 percent of the gross domestic product of the United States.

– Government Accountability Office "Chemical Innovation: Technologies to Make Processes and Products More Sustainable"<sup>8</sup>

---

## WHY WE NEED NEW YORK STATE'S LEADERSHIP

Most existing policies regulating chemicals focus on how to measure, restrict, or control their release into the environment. Many laws, including the Toxic Substance Control, Resource Conservation and Recovery, Clean Air, Clean Water and Consumer Product Safety Acts and subsequent upgrades, result from crises arising from unfettered chemical use and resulting toxic trespass and natural resource damage.

Although they represented real progress in protecting workers, people, communities and the environment, industry pressure has continually weakened them as a necessary safety net. The fox is literally building, decorating, and living in the henhouse.

Here are some prime examples:

### 1) Exemptions

Important toxic aspects of fuel development are exempt from numerous federal laws. For example, in 2005, Congress exempted natural gas drilling from the Safe Drinking Water Act. Companies are not required to disclose the chemicals used during hydraulic fracturing. In 1988, Congress decided not to apply the Resource Conservation and Recovery Act to oil and gas production waste, despite numerous documented cases of damage. Despite significant runoff due to stormwater discharge regulated by the Clean Water Act from pipelines, well pads and other infrastructure, the Act exempts oil and gas exploration, production, processing, treatment operations, and transmission facilities.

### 2) Burden of Proof

Under the Toxic Substances Control Act, the burden is so high to prove that a chemical is toxic and the EPA should regulate it that the US EPA could not even phase out asbestos, which more than 30 countries have banned. This is a glaring example of TSCA's shortcomings. When the EPA banned asbestos, a court ruled that the EPA did not meet the burden of proof and therefore could not regulate it. The EPA has not banned a single chemical for 30 years since this failed attempt.

### 3) The Risk Paradigm

The three potential approaches to chemicals management are risk assessment, hazard assessment, and alternatives assessment. Risk assessment allows the chemical's continued use, and instead attempts to control use and exposure and therefore minimize effects on human health and the environment. Important aspects of risk assessment fall short, including inadequate consideration of factors affecting vulnerability to disease, such as age, stress, and genetics, or exposure, such as workplace, residence, and proximity to sources of pollution.

EPA does not always have all use information with respect to a given chemical, nor does the agency consider cumulative and synergistic effects of exposure to combinations of chemicals. Therefore, risk assessment works quite well for the chemical industry's purposes (continued use of chemicals), but not as well for human health, as evidenced by burgeoning rates of diseases and disorders of environmental origin. Nor does it adequately protect the environment, as evidenced by permanent loss of drinking water supplies, contamination that renders land unfit for human habitation or

agricultural use, decrease in real estate values, and other natural resource damage due to organic chemical contamination. Chemicals, even when used as permitted, escape from products and processes, contaminate the environment, get in our bodies and make us sick.

**Hazard assessment** is a process to determine if a chemical's inherent properties are capable of producing adverse health effects, weighing available scientific data. A hazard assessment includes consideration of how toxic chemicals enter the body, how the body metabolizes and excretes them, what effects they produce on the human body, in animals, and to the environment.

Examples of the use of hazard assessment to regulate chemicals include state-level requirements for disclosure of ingredients in certain product sectors, such as cleaning products and children's products, and green procurement policies that favor products without hazardous chemicals and avoid products that contain them.

**Alternatives assessment** strives to find the best solution to meet a design or performance need while minimizing environmental or health harm. The intention is to avoid "regrettable substitution," in which a toxic chemical is restricted and subsequently replaced with a structurally similar, equally toxic substitute. Ideally, alternatives assessment should consider not just which drop-in chemical substitute is less hazardous, but also product redesign to avoid the need entirely. For example, rather than seek a less-hazardous flame retardant chemical in an electronic device using a petroleum-based plastic enclosure or an infant car seat using petroleum-based polyurethane foam, a design change to inherently flame-resistant base materials meets the fire safety standard without adding a potentially hazardous chemical.

States are enacting policies that push corporate and federal behavior while simultaneously protecting their own environment and the health of their own residents. The shift from a failed risk paradigm to hazard and alternatives-based corporate and government policy is already underway.

New York State has flexed its considerable economic muscles and come out as a leader in protective policy enactment. Leadership actions include a ban on fracking and restriction of chemicals in certain product sectors, such as PBDEs, chlorinated TRIS, bisphenol A, and mercury. New York has enacted toxics in packaging laws, mandatory electronic waste takeback, a cleaning product ingredient disclosure requirement, numerous green procurement specifications, the most protective Maximum Contaminant Levels of perfluorinated chemicals and 1,4 dioxane in drinking water, and testing, reporting and remediation of lead in school drinking water.

New York's government infrastructure includes creation of a Pollution Prevention Institute, funding for seven Children's Environmental Health Centers of Excellence, and seed money to initiate and participate in an Interstate Chemicals Clearinghouse. New York's Office of the Comptroller and Environmental Protection Bureau of the Office of the Attorney General also have significant influence on environmental policy. This roadmap explores the trajectory New York is on, lessons from other jurisdictions and the marketplace, and how we can expand New York's leadership role in environmental health. There has never been more of a need for that leadership than there is now, given the current federal political climate.

## EXPANDING THE FRAME

Environmental health is a broad frame, though often it focuses on specific aspects. That broader frame is visible, for example, in our collective choice of materials: they can have a significant role to play in climate change, in addition to the sources of energy we use.

Plastic is made primarily from fossil fuel feedstocks (oil and gas, including fracked gas). Lower fuel prices drive the use of these unsustainable feedstocks, partially due to the increasing use of renewable energy. At the same time, recent research has shown that common plastics degrade in sunlight, releasing greenhouse gases – so that recycling milk jugs into park benches and dumping plastic waste into the ocean also contribute to climate change.<sup>9</sup>

Additionally, plastics carry toxic chemicals with them as they degrade into microplastics, harming the food chain as the microplastics are absorbed and consumed. Research has found microplastics in the human gut, as well as in fish, tap water, the oceans, and flying insects.<sup>10</sup>

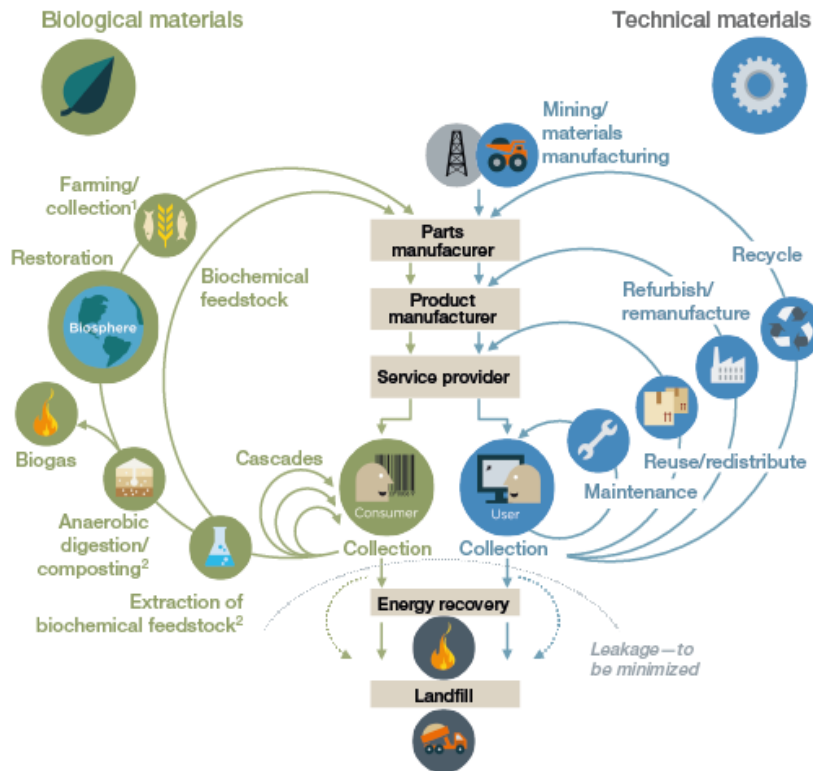
Further, recycling is environmentally friendly, right? We want to avoid dumping solid waste into landfills that end up leaking and harming air and groundwater. We also want to avoid garbage incineration, due to toxic air emissions and the disposal of incinerator ash, where toxics are concentrated, into landfills. The seemingly dueling priority of assuring high percentages of recycling and achieving clean, healthy products has both businesses and regulators scratching their heads and asking themselves, “What do environmentalists really want?”

The presence of toxic chemicals in products makes recycling them problematic by reintroducing these toxicants into new products, where they were never intended and serve no purpose. There are numerous examples, including the presence of bisphenols from ink in recycled printer paper<sup>11</sup>, and toxic flame retardant chemicals in rebond carpet padding<sup>12</sup> and in food contact items made from recycled electronic enclosures.<sup>13</sup>

Beneficial use determinations (BUDs) granted by New York State Government in an attempt to address solid waste disposal can result in toxics being put back into the environment. When granted BUD status, the waste ceases to be solid waste from a regulatory standpoint. Examples include heavy metals in sewage sludge spread onto farmland<sup>14</sup> and carcinogens, hydrocarbons, solvents and radium in brine from oil and gas extraction used as a de-icer on roadways.

Because people are recognizing how everything is interconnected, those focused on a circular economy have developed toolboxes to drive “Safe and Circular” into the Circular Design Guide created by the Cradle to Cradle Products Innovation Institute.<sup>15</sup> In the long term, our planet and many of the species living on it will not survive if we continue to dig up the Earth’s crust, deforest the land, extract fossil fuels to burn for fuel or convert to materials, and pollute our waters, air, and soil with chemicals, some of which will be present for generations.

That is also why the World Economic Forum has focused on the Circular Economy as critical to a vibrant future.



<sup>1</sup> Hunting and fishing

<sup>2</sup> Can take both postharvest and postconsumer waste as an input.

**Source:** Ellen MacArthur Foundation circular economy team drawing from Braungart & McDonough and Cradle to Cradle (C2C)

“A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems and business models.”<sup>16</sup>

– World Economic Forum

In this Roadmap, we will always concentrate on driving toward a nontoxic, sustainable, socially just, circular economy. In a circular economy, we will stop introducing chemicals that harm human health and the environment and switch to nontoxic materials. A circular economy ensures that all people are valued and protected from harm and allowed to thrive. The fundamental change to treating all materials as future inputs, not simply as ultimate wastes, will preserve our irreplaceable resources.

## LANDSCAPE

### GOVERNMENT

#### Federal Laws and Regulations

The United States government did little to curb the developing chemical industry just prior to and immediately following World War II. Rachel Carson's *Silent Spring* is the sentinel book that documented and spurred action on the wanton application of DDT, a pesticide that was causing unseen reproductive damage as it thinned top predator birds' eggshells.

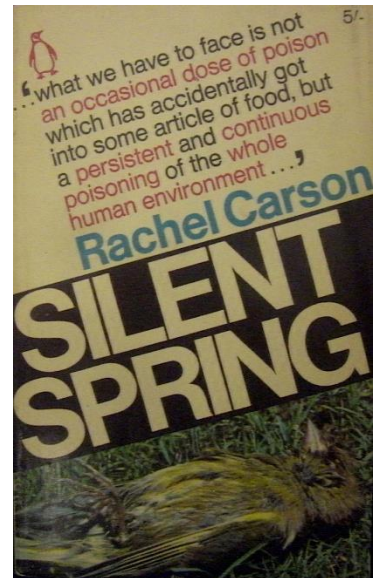
While some laws, like the Federal Water Pollution Control Act, were enacted in the late 1940s and early 1950s, it took until the 1970s for decisive action on environmental hazards. Today, there are dozens of laws, revisions of laws, agencies, and executive orders addressing harm to human health and the environment.

The most sweeping laws were the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act (which created the Superfund for toxic waste cleanup), creation of the National Institute for Environmental Health Sciences, and the Toxic Substances Control Act. By the time these laws were enacted, American industry was hooked on cheap, petroleum-based chemicals and repositories of salts, to make its goods, heat homes, and provide transportation. As a result, every single one of these laws established legal methods for producing, manufacturing with, exposing workers and communities to, and releasing harmful chemicals into air, water, and soil.

Take for example the goals of some of these laws:

The 1972 **Clean Water Act**'s purpose was "to restore and maintain the chemical, physical and biological integrity of the Nation's waters." It forbade dumping anything into (navigable) waters *without a permit*. This regulatory structure is consistent across pollution source. In each case, allowable levels of chemicals are set in a legal structure by which the federal government or state designee determines how much of which chemicals and materials are permitted.

This structure created significant opportunities for profit-focused corporations to operate contrary to the stated public interest goals of the law. Penalties for violations take the form of monetary payments by the corporations, not personal consequences for corporate leaders. The result is cost-benefit analyses by corporations in which they decide to bear the financial burden when the profit from noncompliance outweighs the penalty. Left out of these financial calculations are the current and future costs to human lives, our health care system, education programs, loss of wildlife, and irreparable contamination of the physical and biological world. The risk paradigm discussed in the Introduction further enables companies to manipulate these programs.



Despite significant loopholes, our national air and water is undisputedly cleaner in many places than it was fifty years ago, with profound impact on human health: a recent study found that deaths from air pollution decreased by 47 percent between 1990 and 2010.<sup>17</sup> While the decrease is dramatic, 71,000 people still die from the impacts of air pollution, more than traffic accidents<sup>18</sup> and gun violence combined.

But the influence of the chemical industry and especially the petroleum industry on national policy decisions has undercut the intent of existing and proposed laws. Companies legally continue to produce, add to products, and release into air, water, and soil, chemicals that can harm (including chemicals harmful to our climate and atmosphere). In the 2018 election, four environmental propositions on state ballots failed after the fossil fuel industry invested \$100 million to fight them.<sup>19</sup>

Further, the science documenting the harm chemicals can pose to human health, wildlife, plant life, and our climate has far outstripped federal regulatory oversight. We are regulating space-age chemicals with Jurassic-age policies.

The **Clean Air Act**, as amended in 1990, requires EPA to regulate emissions of hazardous air pollutants<sup>21</sup> and develop a list of source categories that must meet control technology requirements for toxic air pollutants. The EPA is required to develop regulations (also known as rules or standards) for all industries that emit one or more of the pollutants in significant quantities. EPA is working with state, local, and tribal governments to reduce air emissions of [187 toxic air pollutants](#) to the environment.<sup>22</sup> To meet National Ambient Air Quality Standards, for which the primary purpose is to protect human health, including vulnerable populations like children, people with respiratory diseases, and the elderly. EPA is charged with generating review by the Clean Air Scientific Advisory Committee, which has subcommittees to review each of seven types of pollutants. In October 2018, without explanation, EPA disbanded the subcommittees that review particulate matter and ozone.

### Ongoing Failures from Promising Laws

Many federal laws hold great promise to further our understanding of harmful chemicals and their impacts on our health and the environment. But too many have failed us. For example, in 1991, the US Environmental Protection Agency began assessing exposure to and health effects of 2,3,7,8-Tetrachlorodibenzo-P-Dioxin. A draft was finally released in 2004, finding that the chemical has profound effects in tiny quantities. It has never been finalized, 28 years later.<sup>20</sup>

---

### Key Laws Governing Chemicals

In addition to laws governing chemicals at the point source or after they reach our air, water, and soil, and workplaces – all essentially “unintended” routes of exposure - there are several key pieces to the United States’ management of chemical production and use.

### Toxic Substances Control Act and the Frank R Lautenberg Chemical Safety for the 21<sup>st</sup> Century Act

---

Finally, after a decade of advocacy, the Toxic Substances Control Act was revised in 2016. During this long-fought battle, the American Chemistry Council was revealed as the original author of an early draft of the policy that was enacted.<sup>23</sup> The stated purpose included “restoring consumer confidence” in the chemical management system. Since then, the current administration has



appointed numerous former chemical industry or trade association lobbyists to high-level positions within the US Environmental Protection Agency and are now overseeing implementation of the very law they worked to get passed. Budgets for key programs have been slashed. The director of the Children's Environmental Health program was unceremoniously removed from her post days before national Children's Health Day.<sup>24</sup>

The original **Toxic Substances Control Act** was intended to regulate most chemicals before and after they enter commerce, unlike most other federal laws regarding chemicals. However, the law assumed that companies should be able to make and market chemicals, and it put the burden of proving harm on the US Environmental Protection Agency, rather than requiring companies to demonstrate the safety of their chemicals before production begins. The Science and Environmental Health Network identified two primary flaws with the law<sup>25</sup>:

- 1) it does not require companies to provide enough information to the government, users of chemicals, and consumers about chemicals' harmful characteristics. This leaves every decision maker further along the supply chain unable to identify and prefer safer chemicals, and undercuts the ability of governments to fully enforce chemicals laws.
- 2) The law set too high a burden on regulators to act in the public's benefit. For example: despite significant evidence that asbestos causes cancer, the US EPA's effort to implement a complete ban of the substances was blocked in court because the law requires consideration of the economic impact to the "affected industry" – which was deemed in this case to be asbestos producers. In 2018, despite overwhelming evidence of harm, the federal government announced a relaxation of restrictions on asbestos in certain products.

### Consumer Products: Consumer Product Safety Act and More

---

The **Consumer Product Safety Act** passed in 1972, to, as the law states, "protect the public against unreasonable risks of injury associated with consumer products." It covers roughly 15,000 types of consumer products. Action by the Consumer Product Safety Commission (CPSC) under the Act nearly always comes after products are already on the market. It conducts product monitoring, research, investigations, and can set standards. It can enforce certain mandatory safety rules, but in many cases, the Commission must follow "voluntary consumer product safety standards" – which are written primarily by the very industries the standards affect. Common standard setting organizations are ANSI, ASTM, CSA, and UL. In cases where it determines an "unreasonable risk of injury" is occurring, the CPSC may require companies to issue product recalls.

In 2008, after NGO testing of children's products revealed widespread use of high levels of lead and hormone-disrupting phthalates, Congress passed the Consumer Product Safety Improvement Act, which set stricter limits on lead in children's products, and set forth a mechanism for CPSC to evaluate and restrict certain phthalates.

The Consumer Product Safety Commission now administers and enforces the following federal laws related to chemicals: Consumer Product Safety Act (1972), Consumer Product Safety Improvement Act (2008), Public Law 112-28 Updates to CPSIA (2011), Children's Gasoline Burn Prevention Act (2009), Hazardous Substances Act (1960 and amended in 1966), Flammable Fabrics Act (1953),



Labeling of Hazardous Art Materials Act (1988), Poison Prevention Packaging Act (1970), Child Nicotine Poisoning Prevention Act (2015), and the Drywall Safety Act (2012).

The **Federal Hazardous Substances Act** covers substances that are toxic, corrosive, irritating, or flammable in products intended for household use. It requires warning labels that include the primary hazard, how to prevent harm, how to handle and store the product, and the statement, “Keep out of the reach of children.” It prevents shipping of misbranded hazardous substances across state lines. The Consumer Product Safety Commission is the enforcing agency. The definition of “acceptable risk” for cancer-causing chemicals is set at one-in-a-million, for each product containing each cancer-causing chemical. Neurotoxicity risks are assessed applying a linear “dose makes the poison” frame at the “no observed effect level” (NOEL) or 100 times lower than the “lowest observed effect level.” (LOEL)

The provisions for the Labeling of Hazardous Art Materials Act (passed in 1988) explicitly states that unless a producer or repackager agrees in writing, no one other than toxicologists reviewing formulations will have access to the information, unless an individual patient’s physician needs the information to treat cases of exposure or ingestion.

### Food, Drugs, and Cosmetics

---

At the turn of the last century – that is, 1900, items sold as “food” or “drugs” were all too often not what they appeared. Government regulation started in 1906 with passage of the Pure Food and Drug Act. It prevented foods that had been “adulterated” or food or drugs that had been “misbranded” from being sold across state lines. The laws didn’t prevent the sale of radioactive beverages, or worthless “cures” for diseases like diabetes, but wasn’t updated until over 100 people died after diethylene glycol (instead of alcohol) was used to make “Elixir Sulfanilamide” in 1937.

In 1938, The **Food, Drug, and Cosmetic Act** was signed into law, mandating pre-market review of drug safety, banning false claims on drug labels without requiring FDA to prove companies deliberately lied, expanding enforcement powers, setting new standards for foods, and adding cosmetics and therapeutic devices to the scope of authority. It is the foundation of our modern regulatory framework. It required colors to be certified as harmless and suitable by FDA for use in cosmetics.

In the 1950s, following hearings under Representative Delaney, laws to restrict pesticide residues passed in 1954, banning carcinogens in food additives passed in 1958 (known as the “Delaney Clause”, and more stringent requirements for color additives in 1960. In 1962, the law was amended to require new drugs demonstrate evidence they were effective as marketed, limit advertising of drugs to FDA-approved applications, and grant greater inspection powers. It also required informed consent for clinical trials for the first time. The law was drafted in response to harm to developing fetuses by Thalidomide. In 1965, Congress passed the Drug Abuse Control Amendments Act. Medical devices were not well regulated until the 1976 Medical Devices Amendments, when thousands of women were injured by the Dalkon Shield intrauterine device.

The strong prohibition of cancer causing chemicals in foods has been weakened over the years. In 1968, possible carcinogens are allowed to be fed to food animals, as long as residues were not

present in edible tissues. In 1996, the Food Quality Protection Act removed the absolute restriction on residual levels of pesticides that are carcinogens and set risk-based limits.

## Pesticides

---

Pesticides have been regulated in a number of ways under a number of different agencies over the years. Today, the US Environmental Protection Agency is responsible for implementing the Federal Insecticide, Fungicide, and Rodenticide Act. Under a law passed in 1947, USDA had responsibility for overseeing proper labeling of pesticides sold across state lines. As discussed above, Rachel Carson's *Silent Spring* highlighted the significant impact DDT was having on the environment and human health. As a result of new understanding of the enduring impact of pesticides, the US EPA took over, and is now charged with overseeing pesticide use. As currently constituted, EPA must take into account economic, social, and environmental impacts – both costs and benefits – of use of a given pesticide, and ensure no “unreasonable adverse effects” occur, such as “unreasonable risk” to humans or the environment. FIFRA requires specific information on labels. Ingredient disclosure is limited to specific “active ingredients”, all others can be combined into one group as “inert ingredients,” which does not mean they are not toxic.

EPA oversees packaging requirements to ensure pesticides are in child-resistant packaging and have prominent warnings on them. It is required to enforce worker protection standards, which currently center around two approaches for agricultural workers: specific restrictions on specific pesticides, and Worker Protection Standards. The focus is on reducing exposures through personal protective gear, ventilation, and providing information to workers. EPA's website does not prioritize identifying least-toxic solutions to pest problems.

## Occupational Safety and Health

---

The Occupational Safety and Health Act of 1970 created the Occupational Safety and Health Administration (OSHA) within the US Department of Labor. Its mission is to “ensure that employees work in a safe and healthful environment by setting and enforcing standards, and by providing training, outreach, education and assistance.” Further, “Employers must comply with all applicable OSHA standards. They must also comply with the General Duty Clause of the OSH Act, which requires employers to keep their workplace free of serious recognized hazards.”<sup>26</sup>

When it comes to chemical hazards, employers are required to label and provide safety data sheets detailing hazards to any workers who may come into contact with

*“While American workers use tens of thousands of harmful chemicals every day, only a small number are regulated in the workplace. As a result, workers suffer more than 190,000 illnesses and 50,000 deaths annually related to chemical exposures, including cancers and other lung, kidney, skin, heart, stomach, brain, nerve and reproductive diseases.*

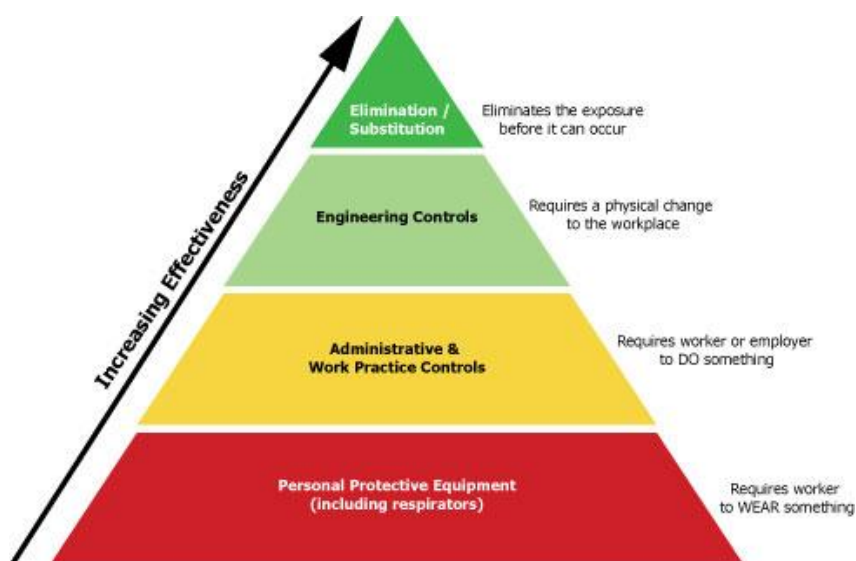
*The best way to protect workers is through a chemical management system that goes beyond OSHA standards and strives to reduce or eliminate chemical hazards through a process of informed substitution.”*

“Transitioning to Safer Chemicals:  
A Toolkit for Employers and Workers”  
blog post by Cari Elofson <sup>28</sup>

hazardous chemicals. Chemical manufacturers and importers are required to understand the hazards of chemicals they produce or import, and must prepare the safety datasheets and share them with “downstream” users. All companies that use harmful chemicals must provide training for employees and measures to protect them. In nearly all cases, employers are required to provide personal protective gear for employees if necessary.

OSHA establishes Occupational Exposure Limits for certain airborne chemicals, and Permissible Exposure Limits (PELs), in a risk-based approach that factors in the number of hours worked. Despite scientific evidence of the potential for thousands of chemicals to cause or contribute to harm to human health or the environment, OSHA has established PELs for only about 500 chemicals. OSHA recognizes that some are outdated, and that it does not have PELs for many chemicals that can harm worker health. To address this, OSHA currently provides additional information on more protective standards, but these are not enforceable limits.<sup>27</sup>

Because OSHA acknowledges that workplace regulations are insufficient to protect worker health, it developed *Transitioning to Safer Chemicals: A Toolkit for Employers and Workers* with seven steps to drive informed substitution. It highlights the value of elimination and substitution as the most effective method of avoiding the harmful impacts of hazardous chemicals.



See Appendix C for a list of the major federal laws.

## Rollbacks

Under the current administration, significant efforts to roll back or undermine environmental regulations have been advancing quickly. As of December 2018, the administration rolled back 47 regulations and was in the process of rolling back 31 more. Eleven rules that were rolled back have since been reinstated following legal challenge.

These regulations cross agencies, including the US EPA, the Transportation Department, the Department of the Interior, Executive Orders, Federal Energy Regulatory Commission, National Oceanic and Atmospheric Administration, Bureau of Land Management, National Park Service, Federal Communications Commission, Department of Agriculture, Labor Department, Army, Department of Justice, and Department of Energy. Those relevant to environmental health include<sup>29</sup>:

- Narrowing the scope of the revisions of the Toxic Substances Control Act- EPA will to focus on direct exposure to chemicals, and ignore air, water, and ground contamination. (Completed.)
- Proposing to limit studies used by the US EPA for rulemaking to only those with publicly available data, effectively excluding many health studies that rely on confidential, and therefore private, health data. (In process as of January 2019.)

- Reversing a requirement that “high hazard” trains carrying flammable liquids upgrade their braking systems. (Completed.)

- Removing “copper filter cake” – a byproduct of manufacturing electronics – from the list of “hazardous waste.” (Completed.)

- Attempting to reject a ban on the pesticide chlorpyrifos; in August 2018 a federal court ordered the ban to go forward, but EPA is appealing the ruling. (In process as of January 2019.)

- Proposing to eliminate two programs that would limit kids’ exposure to lead paint by training workers on the safe removal of lead-based paint and educating the public about the dangers. (In process as of January 2019.)

- Reviewing a rule to lower limits on coal dust in mines. (In process as of January 2019.)

- Revoking a rule preventing coal companies from dumping mining waste into streams. (Completed.)

- Withdrawing a proposed rule to reduce pollution at sewage treatment plants. (Completed.)

- Passing responsibility for overseeing coal ash waste, previously regulated by the US EPA, to states. (Completed.)

- Withdrawing a proposed rule to protect groundwater at uranium mines. (Completed.)

- Delaying limits on dumping toxic chemicals, including mercury, into public waterways by two years. (In process as of January 2019.)

- Loosening restrictions on release of toxic emissions by major industrial polluters, allowing them to stop using the Maximum Achievable Control Technology to control 189 harmful chemicals if the controls bring total emissions below the threshold for classification as “major” polluter in the first place. (Completed.)

- Prohibiting a formerly common practice of requiring companies found to have violated environmental laws to fund environmental and community development projects as part of their settlement. (Completed)

- Reversing the ban on selling water in plastic bottles in national parks, even though the Park Service reported that it cut down on litter. (Completed)

	47	31	78
	ROLLBACKS COMPLETED	ROLLBACKS IN PROCESS	TOTAL ROLLBACKS
 Air pollution and emissions	9	12	21
 Drilling and extraction	10	6	16
 Infrastructure and planning	11	1	12
 Animals	7	2	9
 Toxic substances and safety	3	3	6
 Water pollution	4	2	6
 Other	3	5	8

2 Source: The New York Times, article updated December 19, 2018

- Undoing a requirement that companies prove they had the financial resources to take care of future needs: for mining companies, this was future pollution clean-up costs; for Gulf of Mexico oil rig owners, cost of removing rigs once no longer in use. (Completed)

---

## New York State

The New York State Department of Environmental Conservation was created in 1970, folding together work from the Department of Health (established at the turn of the 20th century), the former Department of Conservation, and other now defunct agencies. NYSDEC's mission is "To conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being." Regarding chemical pollution, the DEC "enhances the health, safety and welfare of the people of New York... [t]hrough the promotion of environmentally sound use of products, including chemicals and pesticides; environmental cleanup and monitoring programs; and effective laws and regulations." Consumer products, including those for children, are regulated by the Division of Consumer Protection of the Department of State.

---

### Addressing the Legacy of Pollution: Cleaning Up Hazardous Waste

The first actions taken by the State to address chemicals addressed massive dumping of harmful chemicals into air, water, and land. After the 1970 creation of the NYS Department of Environmental Conservation, new federal regulations set some limits on air, water, and soil pollution.

Until it was clear people were literally dying from toxic chemicals dumped in their communities, workers were dying from exposure to chemicals in their factories, and wildlife was dying due to toxic chemicals in the environment, companies were largely given free rein to create, use, and dump chemicals into our air, water, and soil, with no consequences. As scientists documented that the chemicals in certain facilities were harming human health and the environment, the public began to demand action, which led to action at specific sites and programs with the goal of cleaning up and protecting the public and broader environment from chemical contaminants.

**New York's 'Superfund'** hazardous waste cleanup program, also known as the Inactive Hazardous Waste Disposal Site (IHWDS) Program identifies, investigates and cleans up sites where "consequential" amounts of hazardous waste may exist. These sites go through a process of investigation, evaluation, cleanup and monitoring that has several distinct stages.<sup>30</sup> Sites are sorted into the following categories:

**Class 1:** Immediate action is required to address a site causing or imminently about to cause irreversible or irreparable damage to human health and the environment. There were no Class 1 sites in 2018.

**Class 2:** Action is required to address a significant threat to human health and the environment. There were 440 Class 2 Sites in 2018.

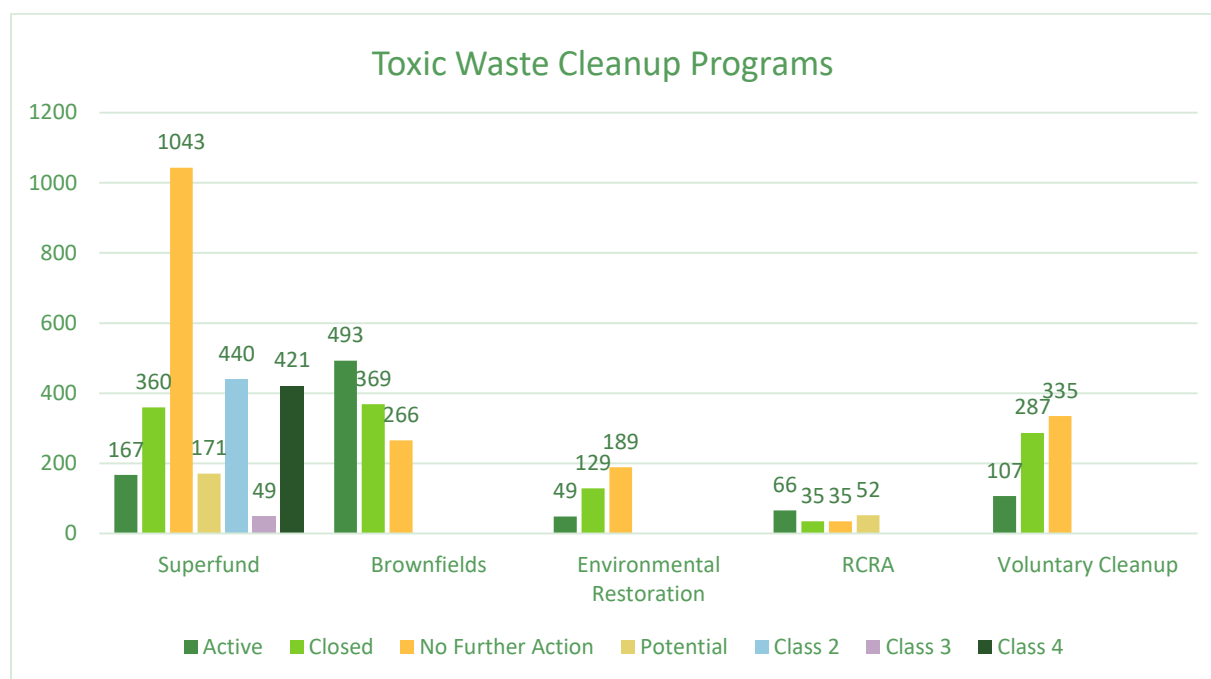
**Class 3:** Action may be deferred because contamination does not pose a significant threat. There were 49 Class 3 sites in 2018.

Class 4: Continuing management is required for a properly closed site. There were 421 Class 4 sites in 2018.

Class 5: No action is required because the site has been properly closed and management is not necessary. Functionally, this designation is not used, as sites are “delisted” when DEC determines that no further action is needed. No sites were listed as Class 5 in 2018.

For additional programs such as the Brownfields Cleanup Program, the Voluntary Cleanup Program, Environmental Restoration Program, and the Resource Conservation Recovery Act (for Federal Superfund sites), the Department has established additional designations: A – A site actively undergoing cleanup; C – Closed or completed; P – Potential sites.

The State has identified over 5,000 sites under these programs. As the chart below shows, cleanup is actively underway.



On ongoing basis, there are over 10,000 oil and chemical spills each year. The figure continues to decline, peaking at 17,193 spills in 2012, and down to 11,559 in 2017.

### Lead: Poisoning Prevention and Treatment; Abatement

Despite millennia of knowledge that lead is harmful to human health, its use has been widespread. Water pipes consisted almost entirely of this heavy, pliable metal. Fuels with tetraethyl lead added had higher octane ratings. Federal laws now limit lead in fuel, paint, plumbing, and children’s products. New York State has taken additional actions to prevent and treat lead poisoning, under Public Health law. It sets forth requirements for the Department of Health to establishing testing for certain pregnant women and for young children for their blood lead levels, and to take action when such levels are above a certain threshold. In situations where lead is present in interior and porch paint, the Department can require abatement. Under Education law, lead salts are a scheduled poison. Any manufacturer or wholesaler must label products containing designated poisons as such,



and must track them and ensure purchasers are aware of the poisonous nature of the product. General Business Law requires labeling of solder containing more than 0.2% lead as follows: “Contains lead which may be harmful to your health. Not to be used for joints on potable water service piping.” Public Health law includes a program to replace lead service lines for drinking water, require schools to test drinking water at each tap for the presence of lead, notify parents, cease use of taps with lead levels above a set amount, and provide safe drinking water. NYS Public Health Law established an Advisory Council on Lead Poisoning Prevention, which has not met since 2017.

Abatement efforts do not sufficiently protect New York’s children. There are limits to how the State implements its laws. For instance, in regulation, as of January 2019 it did not adopt the CDC’s action level of 5 ug/dL, lowered in 2012 by the US Centers for Disease Control.<sup>31</sup> However, there is a Health and Mental Hygiene Article 7 budget bill in the Fiscal Year 2020 Executive Budget to do just that.

Environmental Conservation Law seeks to limit lead in the environment. Lead is listed as a hazardous substance. New York bans use of lead in wheel weights for vehicles, in packaging or inks printed on packaging above 100 parts per million, in small fishing sinkers, restricts use of lead-acid batteries and ensures appropriate recycling of those in use.

---

## Air Pollution

In 1968, New York State issued regulations to control toxic air pollutant emissions from industrial processes. A few years later, Part 257 regulations set limits on nine chemicals: sulfur dioxide, particulates, carbon monoxide, photochemical oxidants, hydrocarbons (non-methane), nitrogen dioxide, fluorides, beryllium, and hydrogen sulfide.

New York has had regulations in place since 1968 to control toxic air pollutant emissions from industrial processing and burning of waste fuels. In the early 1970s, the State also enacted a regulation setting air quality standards for nine toxic air pollutants. The State air toxics program applies to numerous stationary sources and requires them to undergo a screening risk assessment to determine public health impacts from inhalation exposures.<sup>32</sup> It also requires vehicle inspection and maintenance. In 2009, New York also set significant restrictions on open burning: it is illegal to burn garbage, leaves, or any plastics outside of a regulated incinerator. All regulations covering air resources are in Chapter III of 6 NYCRR.<sup>33</sup>

---

## Water Pollution

Two New York State agencies oversee water quality. The Department of Environmental Conservation (DEC) oversees lakes, streams, oceans and other natural waterbodies. Pollution that may reach these waterbodies are regulated under Environmental Conservation Law Articles 17 (Water Pollution Control), 24 (Freshwater Resources), 25 (Tidal Wetlands), and 55 (Sole Source Aquifer Protection). The Department of Health oversees the quality of drinking water and contaminants that may reach water at the point of consumption by people.

To control pollutants entering waterbodies, New York State has created a State Pollutant Discharge Elimination System (SPDES) program under the Water Pollution Control law. It is designed to “eliminate the pollution of New York waters and to maintain the highest quality of water possible – consistent with public health, public enjoyment of the resource, protection and propagation of fish

and wildlife, and industrial development of the state.” It goes beyond requirements of the federal Clean Water Act by seeking to control discharge into groundwater as well as surface water. The program determines what chemical and biological discharges are acceptable to the State.

The Department of Health is charged with protecting drinking water quality,<sup>34</sup> including “acceptable” levels of chemicals present in drinking water, determined using risk assessments. As part of the 2017-2018 State Budget, the NYS Legislature and Governor Cuomo established a new Drinking Water Quality Council (NYS Public Health Law § 1113, to provide recommendations to the Department of Health on emerging contaminants in drinking water, including proposing Maximum Contaminant Levels (MCLs) where needed, as well as the frequency for testing.

The 12-member Council, appointed by the Governor, Senate, and Assembly, must by law meet at least twice a year. The Council’s first task was to recommend Maximum Contaminant Levels (MCLs) for PFOA, PFOS, and 1,4-dioxane to the Department of Health. In December 2018, it recommending levels significantly more protective than the US Environmental Protection Agency<sup>35</sup>.

The law authorizes the Council and the DOH Commissioner to identify additional “emerging contaminants.” In October 2018, the Governor announced \$200 million in funds available to address treatment of the current three emerging contaminants. These chemicals are present due to manufacture and use of products containing them, such as firefighting foam, non-stick and water-repelling materials, and detergents.

---

## Solid and Hazardous Waste Generation

Solid and hazardous waste is regulated primarily by Article 27 (Collection, Treatment and Disposal of Refuse and Other Solid Waste), Article 37 (Substances Hazardous or Acutely Hazardous to Public Health, Safety or the Environment), Article 40 (Hazardous Substances Bulk Storage Act), Article 54 (Environmental Protection Act), and Title 10 (Control of the Bulk Storage of Petroleum) of Article 17 (Water Pollution Control).

---

## Hazardous Substances

Article 37<sup>36</sup> directs the Department of Environmental Conservation to create, and from time to time amend, a list of chemicals “hazardous to the public health, safety or the environment,” defined as those that:

“(i) because of their quantity, concentration, or physical, chemical or infectious characteristics cause physical injury or illness when improperly treated, stored, transported, disposed of, or otherwise managed; or (ii) pose a present or potential hazard to the environment when improperly treated, stored, transported, disposed of, or otherwise managed; or (iii) because of their toxicity or concentration within biological chains, present a demonstrated threat to biological life cycles when released into the environment.” By regulation, the criteria are expanded as follows:

“(1) because of its quantity, concentration, or physical, chemical or infectious characteristics, the substance causes physical injury or illness to humans when improperly treated, stored, transported, disposed of, or otherwise managed;



- (2) the substance poses a present or potential hazard to the environment when improperly treated, stored, transported, disposed of, or otherwise managed;
- (3) because of its toxicity or concentration within biological chains, the substance presents a demonstrated threat to biological life cycles when released into the environment;
- (4) the substance is one whose manufacture, processing, distribution in commerce, use, possession or disposal is banned, prohibited or limited pursuant to the Toxic Substances Control Act (15 U.S.C., section 2601 et seq.) as of January 1, 2008, as amended from time to time;
- (5) the substance is a pesticide whose use or possession is prohibited pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136 et seq.) as of January 1, 2008, as amended from time to time; or
- (6) the substance is defined as a hazardous substance pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.) as of January 1, 2008, as amended from time to time.”

It also directs creation of “a list of substances acutely hazardous to public health, safety or the environment,” meeting criteria for specific lethality in laboratory tests, or which “cause or are capable of causing death, serious illness or serious physical injury to any person or persons as a consequence of release into the environment.”

Regulations (6 NYCRR Part 597) were officially created in 1988 under 1986 law and updated in 1994, 2015, and 2017<sup>37</sup> in response to changes in chemicals listed under the federal CERCLA regulations, and to address concerns brought to the department. There is no specific mechanism for the department to review chemical information to assess whether additional chemicals of concern meet the State’s definition of Hazardous Substance, but the Commissioner has the authority to amend the regulation as needed. In 2017, the department assessed PFOA and PFOS, in response to revelations of these chemicals in numerous drinking water sources.<sup>38</sup>

## Petroleum and Natural Gas

---

Petroleum is comprised of many chemicals that are hazardous to human health and the environment, but because of human reliance on it for fuel, it is regulated differently than other hazardous substances. The same is true of natural gas. There are specific laws and regulations for bulk petroleum, and fossil fuel transport (including through pipelines).

## Solid Waste

---

New York State law requires the creation and biennial review of a State Solid Waste Management Plan. Every two years, the Commissioner is tasked with providing recommendations to increase State procurement of products made with recycled content, boosting recycling and reuse, analyze packaging and other parts of the waste stream to propose ways of reducing waste and conserving energy. The Hazardous Substances in Packaging law requires that the solid waste plan assessment consider additional chemicals that should be restricted in packaging.

Despite the legal requirement for biennial reporting, 2010 was the last year a State Solid Waste Management Plan was issued. “Beyond Waste: A Sustainable Materials Management Strategy for New York State,” laid out recommended goals to “shift from focusing on ‘end-of-pipe’ waste management techniques to looking ‘upstream’ and more comprehensively at how materials that would otherwise become waste can be more sustainably managed through the state’s economy.”<sup>39</sup>

Implementing the Beyond Waste plan “could reduce nearly 21 million metric tons of CO<sub>2</sub> equivalent greenhouse gas emissions annually, save more than 280 trillion BTUs of energy each year—as much energy as is consumed by more than 2.6 million homes—and create 67,000 jobs by 2030 and economic opportunity in the process.”<sup>40</sup> The State has not issued a report since then.

The report recommended legislative updates to the Solid Waste Management Act:

- 1) Set new goals and define new metrics to track waste disposal and diversion per capita. In 2010, New Yorkers produced 4.1 pounds of waste per person per day. *Beyond Waste* proposed a goal of reducing that to 0.6 pounds of waste per person per day.<sup>41</sup>
- 2) Update and clarify recycling and green procurement requirements for state agencies and authorities. The report acknowledges the benefit of Executive Order 4 for green procurement, which has continued to expand and drive more sustainable purchasing for the State, and calls for codifying the policy into law.
- 3) Clarify the Solid Waste Management Hierarchy to more clearly place a preference on waste prevention and reuse above recycling, and those before disposal. *Beyond Waste* recommends clarifying that composting is equivalent to recycling.

Generate and allocate new resources to accomplish the vision of *Beyond Waste*. Recommendations for revenue sources included returning unclaimed bottle deposits to the State to fund municipal recycling programs. In 2013, when the Bottle Bill was revised, funding for the Environmental Protection Fund was increased by \$19 to capture bottle deposit revenue. However, investments in recycling and solid waste minimization were not explicitly increased with this new revenue stream. As the Environmental Protection Fund expanded significantly from \$177 million in Fiscal Year (FY) 2015-16 to \$300 million in FY 2016-17, municipal recycling funding increased from \$7.5 million to \$14 million. However, the annual \$1 million for Secondary Materials Markets has not changed since FY 2012-13<sup>42</sup> Adjusting for inflation, this constitutes an annual funding cut.

---

## Pollution Prevention

In 2005, New York State added a section of Environmental Conservation Law dedicated to Pollution Prevention, Article 28. In § 28-0101, “It is declared to be the policy of the State of New York to promote affordable and cost effective methods to reduce energy and resource consumption and reduce or eliminate the use of hazardous substances and the generation of such substances, pollution or waste at the source in order to conserve, improve and protect New York's environment and natural resources; enhance the health, safety and welfare of its citizens; and increase the economic competitiveness of New York businesses.”<sup>43</sup>

It grants the Department of Environmental Conservation the power to develop and implement policies that provide technical assistance and identify alternative methods to comply with

environmental laws and regulations, track and monitor pollution prevention efforts, integrate pollution prevention into the Department's programs, ensure Department staff can provide pollution prevention assistance to those who request it, coordinate pollution prevention efforts with enforcement and inspection efforts, and train department staff on an annual basis, among other activities.<sup>44</sup>

Article 28 creates the following distinct programs:

**Small Business Pollution Prevention and Environmental Compliance Assistance Program:**<sup>45</sup> The Environmental Facilities Corporation has a Small Business Environmental Ombudsman, who has emphasized compliance, not prevention, as evidenced by the EFC.<sup>46</sup> There is an important opportunity for the State to revive its explicit focus on pollution prevention, particularly in reducing toxic chemical production and use.

**The New York State Pollution Prevention Institute:** Created under a law passed in 2007, the NYSP2I has been run by the Rochester Institute of Technology since 2008.<sup>47</sup> More detail about this program is below in the section on projects funded by the Environmental Protection Fund.

**Pollution Prevention and Environmental Compliance Coordinating Council** operated from 2006 to 2011, but there are no meeting announcements in the Environmental Notice Bulletin since then.

In recent years, the State has funded programs aimed at pollution and toxics reduction, through their **Environmental Investment Fund**. That program is cancelled, and no equivalent funding opportunity is available in the Consolidated Funding Application of 2018.<sup>48</sup>

The DEC has developed several efforts to promote inherently safer businesses, including the Commissioner's Policy 59 - **Environmental Audit Incentive Program** mentioned above. This program allows companies to complete audits to identify and address any areas the company may be out of compliance with environmental law, and to establish pollution prevention practices or an environmental management system.<sup>49</sup>

DEC has also advanced a **Green Business** program<sup>50</sup> that provides endorsement when businesses, already in compliance with state and federal laws, undertake projects that "improve their environmental performance," and publicly promote their outcomes. In exchange, the State offers recognition via use of the NY Green business logo, priority access to state technical assistance, and access to other sustainability leaders. The DEC has set overarching criteria, and is developing specific sectors of interest, including breweries, garment cleaners, and restaurants. These criteria are not consistent about promoting reduction in use of harmful chemicals.

In 2008, then-Governor David Paterson issued **Executive Order 4**, which directed the creation of an Interagency Committee on Sustainability and Green Procurement and development of green specifications for products purchased by the State,<sup>51</sup> run by the Office of General Services (OGS). As of 2018, the program had developed nearly 50 specifications for products ranging from commercial clothes washers to pavement sealer to single use food service utensils.<sup>52</sup> As of FY 2016-17, among other things, the program has decreased paper use by 57% since fiscal year 2008-2009 and increased State recycling rates from 50 to 70%.<sup>53</sup> The State has issued contracts that are fully in alignment with the green specifications for general cleaning and for computers.

In 2011, New York created a new business category, “**benefit corporations**,” which are established to perform social good while still being a for-profit venture. Such a company must consider established social and environmental priorities, not just maximizing financial profit alone. Nineteen states and the District of Columbia have similar laws, per a guide for small businesses wishing to incorporate as a benefit corporation published by the University at Buffalo.<sup>54</sup> New York now has 89 companies registered as benefit corporations.<sup>55</sup>

---

## Environmental Justice

In 1999, following “tremendous activity from environmental justice stakeholders around the state,”<sup>56</sup> DEC created an Office of Environmental Justice which “serve[s] as a vehicle to address environmental justice concerns in the environmental permit review process and across other DEC operations.”

Under DEC Commissioner’s Policy 29, DEC must incorporate environmental justice considerations into environmental permit reviews and application of the State Environmental Quality Review Act, as well as consideration of environmental justice impacts into enforcement, grants, and public participation programs.<sup>57</sup>

Regulation Part 487 requires analyzing environmental justice issues in siting of large-scale electricity-generating facilities, under Public Service Law Article 10.

The DEC offers Community Impact grants for community-based organizations to conduct projects that address needs in areas it has designated as Environmental Justice areas. Since its creation in 2006, DEC has awarded \$4 million to fund 121 projects.<sup>58</sup>

DEC’s “ECO-Quality” paired Environmental Conservation Officers with the Office of Environmental Justice to work with community leaders in areas designated as “environmental justice communities” to identify businesses such as gas stations, dry cleaners, and auto body shops that release chemicals harmful to residents’ health. With a focus on improvements rather than penalties, companies that received warnings for being out of compliance with environmental regulations have come into compliance at follow-up visits. This program empowered communities to identify problems, and the statistics validate this approach:

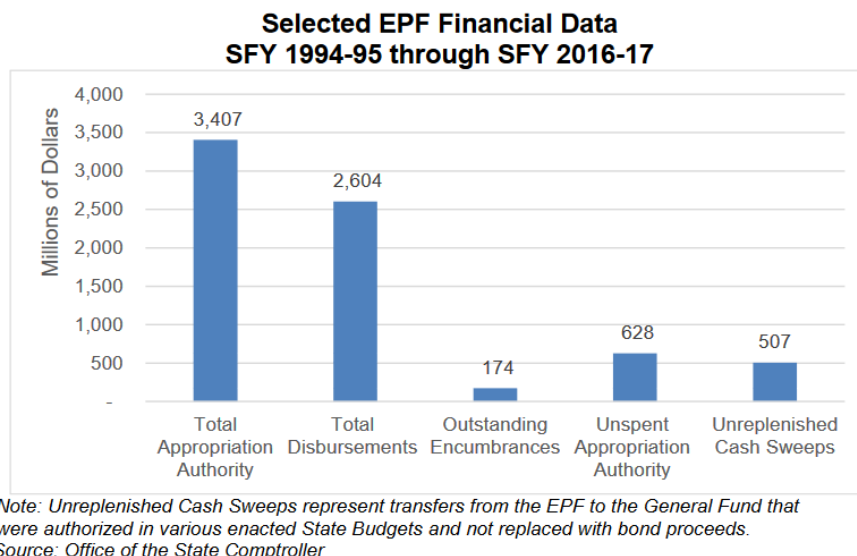
- Compliance in the City of Yonkers increased from 42% to 91%
- In Mount Vernon, compliance rose from 36% to 86%
- In Jamaica, Queens, of the assessed facilities, compliance increased from 92% out of compliance (8% in compliance) to 95% in compliance

---

## Environmental Protection Fund

New York State established the Environmental Protection Fund to provide resources in State-led projects, or in projects in partnership between state agencies and either non-governmental organizations or municipalities, to conduct environmentally beneficial programs or to make capital purchases to preserve land. Established in 1993 with an initial \$31 million for 1994-95, the allocation has increased to \$300 million in 2018-19. The Fund provides resources in the following

named categories: Open Space, Parks, Recreation and Historic Preservation, and Solid Waste. Environmental Health and Justice Projects are in the Solid Waste and Open Space categories.



From the report "New York State's Environmental Protection Fund: A Financial History " 59

Environmental Protection Fund Projects focused on Environmental Health and Justice include:

**New York State Pollution Prevention Institute (P2I)**<sup>60</sup> The P2I helps New York's businesses and communities reduce use of toxic chemicals, materials, energy and water, leading to reduced air and water emissions, and waste generation, often with cost savings overall. The P2I provides direct assistance to solve specific problems, helps accelerate green technologies, supports sustainable supply chains, assists in creating a sustainable food system, provides lifecycle assessments, identifies industry sectors to spread green technologies, holds workshops and trainings, and supports community projects with an annual grant program. Initially receiving \$1 million each year, core funding is now \$4 million annually, with \$100,000 for the Interstate Chemicals Clearinghouse.

**Interstate Chemicals Clearinghouse (IC2)**<sup>61</sup> is a membership organization for state, municipal, regional, and tribal government agencies, with academic, business, and non-profit supporting members, housed at the North East Waste Management Officers Association (NEWMOA). The IC2 is creating a multi-state database to facilitate manufacturer reporting of chemicals of concern identified by Washington, Oregon, and Vermont in children's products. They maintain a database of the chemicals identified by states as chemicals of concern, and another of state chemicals policies. The IC2 issued a template guidance on conducting Alternatives Assessments. New York State Department of Environmental Conservation staff have held various leadership roles in the IC2. New York State was a founding member in 2008.

**NYS Children's Environmental Centers of Excellence (NYS CHECK)**<sup>62</sup> is a network of seven health care institutions across New York State that provide support for pediatric environmental health by building capacity in the broader health care community to prevent, diagnose, and treat diseases of environmental origin or with environmental contributors, for pregnant women, babies, toddlers, up to young adults. NYS CHECK provides education and training, consultation and guidance for health

professionals, clinical services, community partnerships, and public health marketing. It is led by doctors at the Icahn School of Medicine at Mount Sinai in New York City.

Additional programs include:

- A pesticide program and support for municipal and agricultural non-point source pollution Control to address Integrated Pest Management
- Municipal recycling, including organics, food waste, and paint reuse, and Secondary Materials Marketing for recycled products
- Landfill closure and gas management
- Environmental justice community impact grant program
- Land banks for lead abatement
- Clean Sweep for removing chemicals in schools
- The Center for Clean Water Technology at Stony Brook
- SUNY Stony Brook chemical testing lab
- Cornell University Waste Stream Study

In the 2018-19 budget, the State allocated 19% (\$58,474,000 of \$300,000,000) of the Environmental Protection Fund to pollution, pesticide, and environmental health and justice projects.<sup>63</sup>

---

## Action on Chemicals

The first chemicals that received state attention were lead and PCBs, both of which were also highlighted nationally: the only chemicals with full manufacturing, processing, use, and distribution banned under the Toxic Substances Control Act were polychlorinated biphenyls (PCBs). New York State has restricted chemicals in specific product categories in recent years, including the following:

**Bisphenol A (BPA):** NY's Suffolk County was the first to restrict BPA, a known environmental estrogen linked to ovarian cancer, thyroid disruption, and other health effects.<sup>64</sup> Several counties followed, and in 2010 the State banned BPA in baby bottles, sippy cups, and pacifiers. It was among the first state-level restrictions in the nation, and played a role in the eventual federal ban of BPA in baby bottles and sippy cups.<sup>65</sup>

### Flame Retardants:

- *PBDEs:* In 2004, New York banned products with the polybrominated diphenyl ethers pentaBDE and octaBDE<sup>66</sup> and created a Task Force on Flame Retardant Safety, to study ready availability of safer, cost- and performance-effective alternatives to decaBDE. They were to issue their findings by the end of 2005. They issued the report nearly eight years late, in 2013.<sup>67</sup> This task force exemplified an industry-driven, ineffective model.
- *Green procurement specifications* restrict and prohibit flame retardants in products purchased by New York State, such as computers and furniture.<sup>68</sup>
- *Chlorinated Tris* - New York was first in the nation to ban carcinogenic TCEP in 2011 in products for children aged three and under (car seats, nursing pillows, crib mattresses,

strollers, changing pads, swings, carriers, high chairs, etc.). NYS expanded the ban in 2014 to add TDCPP, another Tris chemical and carcinogen.

**Phosphorous:** In 2010, New York set limits (0.5%) on phosphorous in household and commercial dishwasher detergents, and on applying phosphorous fertilizers in non-agricultural settings. This followed regulations to restrict phosphorous in other cleaning products in 1971.

**Mercury:**

- In 2004, with amendments in 2005 and 2011, New York banned mercury-added novelty items, thermometers, switches, relays, vehicle parts, thermostats, and elemental mercury. It also required labeling of all mercury-added products and banned knowing disposal of mercury-added consumer products as solid waste.
- In 2006, New York required vehicle dismantlers to remove any mercury-containing components before crushing a discarded vehicle.
- In 2010, New York banned mercury in wheel weights.
- In 2014, New York required manufacturers to create a collection and recycling program for mercury thermostats.

**Lead:** In 2010, New York State banned lead in vehicle wheel weights.

**Batteries:** In 2010, New York State required retailers in the state that sell rechargeable batteries establish free collection and recycling programs, to make it easy for residents to comply with a new ban on disposing of the batteries as solid waste.

**Pesticides:** In 2010, New York limited the use of chemical pesticides for aesthetic purposes in areas such as schools and child care programs, and directed the Department of Health to develop guidance on alternative pest management.<sup>69</sup>

**Green buildings:** In 2009, New York State required construction and substantial renovation of State buildings comply with “green” building standards set by the Office of Government Services, to conserve resources (energy, water, materials) and improve air quality by selecting materials that are made of safer chemicals.

**Tracking cancer and releasers of harmful chemicals:** In 2010, New York established a program for the Departments of Health and Environmental Conservation to create online maps showing cancer incidence and the locations of environmental facilities.<sup>70</sup>

**Green Cleaning in Schools:** In 2005, New York State passed a law requiring elementary and secondary schools to clean their facilities using only green cleaning products to protect school employees and children from harmful chemicals.

**Toxics in Packaging Law:** In 1990, New York State enacted a Toxics in Packaging law<sup>71</sup>, as have a current total of 19 states. The law bans four heavy metals in packaging above 100 parts per million: lead, mercury, cadmium, and hexavalent chromium. It requires recommendations from the department of environmental conservation on additional chemicals that should be included, for consideration by the legislature, in its annual solid waste management plan. The last solid waste management plan issued by the Department was in 2010.

**Household Cleansing Products:** In 1971, New York State enacted Article 35, Detergents and Other Household Cleansing Products, to reduce discharge of phosphorous into the state's waterbodies. Regulations also restrict the presence of nitrilotriacetic acid in cleaning products.<sup>72</sup> Regulations also require companies to provide ingredient information to the State "in such form as may be prescribed by the commissioner." It also requires disclosure of the nature and extent of research conducted to understand the effects of ingredients or products on human health and the environment.<sup>73</sup>

---

## Attorney General

The New York State Attorney General has the authority to enforce the State's laws. Its Environmental Protection Bureau enforces a "zero tolerance policy against environmental threats" and seeks to continue "to be a national leader on the environment."<sup>74</sup>

The relevant role of the Attorney General includes enforcing the state's environmental health laws via testing to verify compliance, filing lawsuits and using costs recovered to fund environmental health projects that benefit the residents of this state, defending the state's authority to address environmental health concerns from preemption efforts at the federal level, and advocating for federal government policies that are consistent with the state's views. Across many individuals holding the title, the New York State Office of Attorney General performed all of these roles.

Legal action against manufacturers:

- Pursuing manufacturers of children's products with lead, including filing a lawsuit in 2018 to hold companies accountable for lead-containing toys, following testing they conducted.

Enforcing the State's laws to protect environmental health:

- Working with the DOI to secure the arrest of a NYC Department of Environmental Protection inspector who had taken bribes from an asbestos abatement contractor in exchange for overlooking violations at the contractor's worksite, among other things.<sup>75</sup>
- Following up on product testing in 2016 that found illegal levels of lead in children's toys sold in New York State by suing Target, Walmart, and importer LaRose industries.<sup>76</sup>
- Partnering with Governor Cuomo to file a lawsuit against the manufacturers of firefighting foam for their use of hazardous chemicals known as PFAS.<sup>77</sup>

Suing the federal government to strengthen environmental health protections:

- Suing the Environmental Protection Agency to protect farmworkers from harmful pesticides. In May 2018, AG Underwood was joined by Attorneys General from California and Maryland to prevent indefinite delay of a requirement that employers improve pesticide trainings within the Agricultural Worker Protection Standard.<sup>78</sup>
- Intervening in a lawsuit to require the US EPA to protect New Yorkers from air pollution and smog from out-of-state.
- In partnership with five other state Attorneys General, intervening in a lawsuit seeking implementation of the EPA's planned restriction of the neurotoxic pesticide chlorpyrifos.<sup>79</sup>

Commenting on proposed federal regulations:



- Submitting findings of national climate assessment to rulemaking in which the Environmental Protection Agency proposed to roll back the Clean Car Standards and Clean Power Plan.<sup>80</sup>
- Leading a 29-member coalition of states, counties, and cities to oppose EPA's plan to gut the clean power and clean car regulations.<sup>81</sup>

Using settlement fees to advance environmental health:

- Directing \$2.2 million in settlement funds to the Buffalo Green and Healthy Homes Initiative.<sup>82</sup>
- Dedicating \$4.6 million in settlement funds for local projects that improve water quality in the Bronx River, Lake Champlain, and Adirondacks.<sup>83</sup>

---

## Comptroller

The Comptroller is the sole trustee of the NYS Common Retirement Fund (\$207.4 billion, as of January 2019). As such, they decide how to invest those funds, and engage companies as one of the largest institutional investors globally. They can also decide to divest from companies that do not meet environmental criteria. As of January 2019, the Comptroller has committed to investing \$10 billion in sustainable, climate change-fighting, companies. Comptroller DiNapoli has filed more than 125 climate change-focused shareholder resolutions, reaching 55 agreements. The Comptroller is responsible for reporting on state finances and produces annual reports on the Environmental Protection Fund. Information from the most recent analysis contributed to this report.

They also conduct audits of state agencies and public benefit corporations. Environmental health-related audits include:

Department of Environmental Conservation:

- Electronic waste recycling fee collection (2015)
- Oversight of the Pesticide Reporting Law (2018)
- Collection and use of oil spill funds
- Aspects of the Inactive Hazardous Waste Site Remediation cost recovery (2015)

, State University of New York:

- Oversight of hazardous materials and waste

Environmental Facilities Corporation

- Monitoring of the Green Innovation Grant Program

---

## Lessons from Local Government

---

### New York City

The goal of “One New York: The Plan for a Strong and Just City” is “to become the most resilient, equitable, and sustainable city in the world.”<sup>84</sup> Bold goals including reducing greenhouse gases by 80% by 2050, becoming Zero Waste, divesting from fossil fuels, and cleaning up contaminated land.

Creation of a long-term plan is required under Local Law 84, passed in 2013. It requires issuing a plan “considering population projections, housing, air quality, coastal protections, and other sustainability and resiliency factors” every four years on Earth Day.

Zero Waste goals will be met in part by collecting organic waste, offering single-stream recycling and in the future, a “save as you throw” pricing structure for garbage, bringing recycling to all residents. Along with Executive Order 26, goals include making all public schools zero-waste, expanding reuse and recycling of textiles and electronics, and reducing commercial waste disposal by 90% by 2030.

Starting in 2007, New York City became the first municipality in the United States to operate its own brownfield cleanup program to improve the thousands of contaminated and vacant sites within the five boroughs such that they cease to contribute to community health threats and can return to productive use. These programs embed social equity considerations, to address the need for environmental justice in communities of color and low-income neighborhoods, which house a disproportionate number of such brownfields.

In addition, New York City has a green procurement program that created a Director of Citywide Environmental Purchasing, charged with creating and implementing environmental purchasing standards that “conserve energy and water; increase the use of recycled and reused materials; reduce hazardous substances, with an emphasis on persistent, bioaccumulative and toxic chemicals; decrease greenhouse gas emissions; improve indoor air quality; promote end-of-life management; and reduce waste[.]”<sup>85</sup>

## LESSONS FROM THE MARKETPLACE

Due to increased government regulation of chemicals, pending or existing laws requiring ingredient disclosure, and public demand for transparency and safer products, leading companies have taken on the challenges of assessing and screening out chemicals of concern. Some new companies have formed to produce chemicals using green chemistry and engineering principles.

The trade publication “Supply & Demand Chain Executive” identified the following four global megatrends for implementing beyond-compliance sustainability practices in a July 11, 2018 article entitled, “New in Sustainability: Megatrends Driving Opportunity for Change.”<sup>86</sup>

**1) The financial need for stability.** Investors are looking at sustainability performance as part of their decision-making, and more procurement organizations, particularly government bodies, are considering environmental criteria beyond meeting regulatory requirements. New York State is a market driver, with its broad set of green purchasing specifications. The Comptroller has applied some sustainability criteria, but could do much more with the State’s pension investments.

**2) Business leaders, in response to public pressure, are owning accountability.** Companies are responsible for what ends up in their product or service, which means downstream businesses are recognizing the need to “own” decisions made throughout their supply chain. New York State helps companies do this effectively through the NYS Pollution Prevention Institute’s Sustainable Supply Chain program, but could do more to hold lagging companies accountable to this reality, which can spur further business innovation.

**3) Disruptive technologies are now driving sustainability.** Data can be tracked more easily than ever, with real-time information available to be transferred between companies, between employees and corporate leaders, and more. These technologies are at the heart of large, complex businesses being able to provide transparency about the chemicals in their products. New York State can take advantage of this by requiring increased ingredient transparency in many product categories.

**4) Collaboration within industries can improve all participants' outcomes.** Collaborations in the marketplace can give individual companies access to solutions across their supply chains that they could not develop on their own. This isn't true only for for-profit ventures. States working together can cut costs for solutions all can apply by working together. A good example is the Interstate Chemicals Clearinghouse, in which New York State has been a leader.

## Challenges and Risks

A major challenge to changes within the business supply chain is lack of transparency. Some of this is due to fears that a party down the supply chain, upon learning full ingredient lists, will find a cheaper supplier to use the same components. This has driven even greater opacity than would be required to protect trade secrets, and it has a significantly negative impact on selecting materials that meet robust safety criteria. In addition to obscuring intentionally added chemicals, information is not transmitted about non-intentionally added substances, including processing aids and solvents, impurities, contaminants, reaction by-products, breakdown products, and neoformed products. This leaves downstream purchasers unable to distinguish between companies that are careful formulators with few non-intentionally added substances, or how many are present.

### Chemical composition of plastics



As an example, the Food Packaging Forum recently presented information about plastics in food contact chemicals, and their database of chemicals associated with plastic packaging<sup>87</sup> includes 4,255 chemicals – 902 of which are likely associated with plastics packaging, and 3,353 which are possibly associated with plastic packaging – because this information is simply not accessible.

Fortunately, there is an increasing push for communication along the supply chain, including with product users.

Companies face risks if not dealing with chemicals:

**Regulatory risks** – without proactive manage of chemicals, companies cannot get ahead of the regulatory requirements. Regulations of substances has increased faster than any other type of regulation.

**Reputation risks** – consumers are increasingly paying attention to the materials and chemicals in their products and packaging, and the sources of those components. Internet sales now allow small companies to disrupt long-standing market sectors.

**Redesign risks** – If company response is only to new regulation, no matter how swift, it runs the risk of reformulating to a chemical that will also be regulated in the future. While it is not always possible to know which new scientific understanding will illuminate new pathways of health and environmental hazards, regulations currently focus on a relatively small set of chemicals, compared to the thousands of chemicals that are identified on lists of chemicals of concern as issued by credible scientific bodies. By looking toward inherently safer materials, companies can avoid costs of repeated redesign and reformulations.

The following are models for market transformation.

---

## Business Certification

**Incorporating as a Benefit Corporation** under New York State law. In 2011, New York State created the designation of “Benefit Corporation” (see the Pollution Prevention section above). Since then, 89 companies have registered as such. Benefit corporations must have a purpose to create general public benefit, meaning “material positive impact on society and the environment, taken as a whole, as assessed against a third-party standard, from the business and operations of a benefit corporation.” Companies may also identify one or more specific public benefit purposes in their bylaws and articles of incorporation. SUNY Buffalo State’s Small Business Development Center has published a guide for interested businesses.<sup>88</sup>

**Becoming certified B Corporations.** B Labs, a third party nonprofit organization, certifies B Corps. To receive the designation, companies must have been in operation for at least a year and conduct a B Impact Assessment. Their legal documents must include language that legally protects directors and officers for considering the interests of all stakeholders, not just shareholders, in their decision-making, creates additional rights for shareholders to hold directors and officers accountable for considering the interests of all stakeholders, and limits the expanded rights to shareholders alone. Companies then sign a B Corp Agreement. They must undergo a multi-step verification process. New York has<sup>89</sup> 134 businesses registered as B Corporations.<sup>90</sup>

An example is Carnegie Fabrics – based in Rockville Centre, this company makes PVC-free textiles for upholstery, wallcoverings, windows, and panels. They use biobased fibers made from sugar to make some of their products. Carnegie became a B corporation in 2014, and received recognition as one of the B Corporation’s “Best for the World 2018” Environmental Honorees.<sup>91</sup>

Employing **Environmental Management Systems** and being certified meeting ISO (International Standard Organization) 14000 standards by a separate, authorized third party.

**Sector-specific certifications** are also available, to recognize companies that are leaders within that sector. These include certifications offered by New York State’s Green Business program,

---

## Product Certification

Product certification is the process of certifying that a product passes performance and quality assurance tests, and meets certain criteria. In the search for nontoxic products, there are a variety of product certifications, each of which has its own voluntary standards and definitions of what is

acceptable. Certifications can be public facing – appearing on labels – or internal to the supply chain, focused on business-to-business communication. Some companies based in New York State were founded to provide inherently safer products and materials focus on certifications of their products, instead of their companies. One example is Ecovative, which offers fungus-based bound materials in place of foams in packaging materials, oriented strand board, and more, avoiding formaldehyde-based adhesives.<sup>92</sup>

## TYPES OF CERTIFICATIONS

**First-party** certifications are those made by companies themselves. These self-certifications tend to be designed to fit the product, rather than the other way around. The Federal Trade Commission has cracked down on environmental claims from product makers, including actions against Pure Rest/EcoBaby's self-made "National Association of Organic Mattress Industry" seal for mattresses and Benjamin Moore's "Green Promise" seal it displayed on paint cans.

**Second-party** certifications are those made by trade associations for the relevant sector. These vary in how far beyond legal requirements they go. For example, Certipur-US®<sup>93</sup> was created and overseen by the Polyurethane Foam Association and now by the Alliance for Flexible Polyurethane Foam, which was founded by PFA and the American Chemistry Council.<sup>94</sup>

**Third-party** certifications are developed and run by non-profit organizations or government bodies with no financial stake in the outcome. In general, third-party certifications are the most health protective and address the broadest range of concerns. Some tend to be multi-level or evolve over time along with the trend toward safer products. Independent third-party certification means that an independent organization has reviewed the manufacturing process of a product and has independently determined that the final product complies.

Some certifications have a very limited focus, for example UL's GreenGuard<sup>95</sup> focuses on volatile organic compounds. Others focus on specific feedstock content: recycled content, or the percentage of the product that is bio-based materials. Some have a much broader focus. The following are examples of certifications that address a wide array of chemicals of concern:



**Made Safe®:** The Made Safe certification program for consumer products that recognizes products made without a broad range of chemicals that contribute to cancer, neurological problems, developmental harm, hormone disruption, infertility, respiratory problems, and more. The Made Safe® certification was founded in New York State. <https://www.madesafe.org>



**Cradle to Cradle Certified™:** This program covers five categories: material health, material reuse, renewable energy and carbon management, water use, and social fairness; with five levels of certification to promote continuous improvement. <https://www.c2ccertified.org/get-certified/product-certification>



### **US Green Building Council Leadership in Energy and Environmental Design (LEED):**

This program applies to buildings as a whole in their design and construction. Its criteria cover many aspects of the building, including energy and water conservation, indoor air quality and chemical inputs, and waste minimization. LEED <https://www.usgbc.org/leed>

---

## **Tools to Help Businesses**

Many larger companies now produce Corporate Responsibility Reports, and include in them metrics on energy consumption and investment in energy conservation and renewable sources of energy. Some companies track their “carbon footprint” – their release of greenhouse gases – using readily available tools. The Chemical Footprint Project<sup>96</sup> provides a metric for benchmarking companies as they reduce their use of chemicals of high concern and select safer alternatives.

There are a number of tools available now to assess chemicals in a product category or company.



One such tool is the **Chemical Footprint Project**, which helps companies benchmark themselves as they reduce chemicals of concern and choose safer alternatives. The program is designed to create a common language across and within organizations, provide quantitative metrics to measure progress, create a holistic perspective, provide gap analysis for understanding where companies fit within their sector and more broadly. Its systemic framework aids compliance with some ecolabels and regulatory requirements, and aligns with other sustainability criteria. [www.chemicalfootprint.org](http://www.chemicalfootprint.org)

**Understanding chemicals.** There are businesses that offer chemical management software, with extensive databases of chemicals of concern that help companies understand the potential hazards posed by chemicals in their products and/or production, and assess alternatives. They also allow downstream users like brands and retailers to screen out chemicals of concern. Examples include Scivera, UL WerCS, SafeTec, and more.<sup>97</sup>

Free information is available from Healthy Building Network in their Chemical Hazards Data Commons<sup>98</sup>, which allows searches for over 100,000 chemicals for information on 46 scientific lists of specific human health and environmental hazards, 32 Restricted Substances Lists, and GreenScreen List Translator scores.

---

## **State Investment in Green Businesses**

New York State is home to many incubators, and invests heavily in economic development. Recent estimates are that between tax breaks and direct spending by the state or local governments and authorities, New York spent \$8.6 billion dollars in 2016.<sup>99</sup>



---

## Effective Public Interest Engagement

**Investor advocacy** – Partnering with organizations like *As You Sow* to introduce shareholder resolutions has resulted in corporate action on various socially beneficial policies, such as development of restricted substances lists. The Investor Environmental Health Network is “a collaborative partnership of investment managers, advised by nongovernmental organizations. Through dialogue and shareholder resolutions, IEHN encourages companies to adopt policies to reduce and eliminate toxic chemicals in their products.”<sup>100</sup>

**Global supply chain engagement** - Greenpeace has successfully paired testing and documentation of the textile industry’s water pollution in Asia with public pressure campaigns in the United States and Europe to drive 15% of the textile industry to commit to zero discharge of hazardous chemicals.<sup>101</sup> The combination of evidence of human health and environmental harm, coupled with high-visibility actions aimed at specific companies, forced companies to commit to action. Sustained monitoring has caused them to follow through.

**Retailer engagement** – The *Mind the Store*<sup>102</sup> campaign has moved certain American retailers to adopt chemicals management policies, starting with adopting restricted substances lists and expanding to cover more robust criteria, including supply chain transparency, assigning responsibilities to specific staff, and charting progress using the Chemical Footprint Project. To track retailers, the campaign has issued annual Retailer Report Cards, called “Who’s Minding the Store?”<sup>103</sup> that influence business decision-making, to increase their scores. The Campaign for Healthier Solutions<sup>104</sup> has engaged dollar stores, to address the needs of poor and working class Americans who shop in those stores for low-cost, healthy products, and the *Getting Ready for Baby*<sup>105</sup> campaign has focused on addressing chemical use in baby and toddler products, engaging retailers for parents and for child care providers.

---

## Collaboration

Collaboration between companies can accelerate transition to safer materials. The *New York Sustainable Business Council*<sup>106</sup>, a subsidiary of the *American Sustainable Business Council*<sup>107</sup> - works with businesses that prioritize sustainability, including addressing chemicals of concern, water quality, and climate change, to advocate for strong government policies. Regional associations include the Green Business Partnership, started by the Business Council of Westchester County,<sup>108</sup> and the Western New York Sustainable Business Roundtable.<sup>109</sup> These spaces are excellent venues for businesses to discuss strategies for selecting safer materials, and to share lessons learned.

## ACADEMIC INSTITUTIONS

New York State is home to dozens of highly-respected academic institutions that are leaders in conducting research into the impact of chemicals in our environment on human health, seeking solutions, and preparing the next generation of engineers, scientists, health care providers, architects, and more. The following are a sampling of these institutions.

**Rochester Institute of Technology** – RIT is home to the Golisano Institute for Sustainability,<sup>110</sup> and the NYS Pollution Prevention Institute<sup>111</sup>. Within the Golisano Institute, foci include eco-friendly

electronics and electronic waste, the Staples Sustainable Innovation Lab for sustainable office environments, the Center for Integrated Manufacturing Studies, and the Center of Excellence in Advance and Sustainable Manufacturing. It has testbeds for biofuels, and eco-IT, an Eco-Design Lab, Environmental Chemistry Lab, Sustainable Building Materials Lab, and more.

**Clarkson University** – Clarkson offers degrees in Environmental Science and Policy, and has an interdisciplinary Institute for a Sustainable Environment.<sup>112</sup> As a partner university within the NYS Pollution Prevention Institute, Clarkson provides capacity for projects focused on green processing via process intensification, advanced materials synthesis for pollution reduction, environmental systems, green supply chain management, biofuels testing, and monitoring/sensors.<sup>113</sup>

**Columbia University** - Since 1998, Columbia University has housed the Columbia Center for Children's Environmental Health, which "strives to create a world in which every child has a healthy start." The Center conducts research, and works in partnership with community organizations to advance preventive measures that protect children from environmental threats.<sup>114</sup>

**Cornell University** – Cornell boasts that 30% of its faculty conduct research on sustainability.<sup>115</sup> They have a dozen centers and institutes focused on sustainability, and have taken demonstrable steps to green their offices and laboratories on campus, modeling the kinds of changes that could be implemented across the state. It is a partner university within the NYS Pollution Prevention Institute.

**Icahn School of Medicine at Mount Sinai** – The School has a significant focus on pediatric environmental health. They host a federally-funded Pediatric Environmental Health Specialty Unit (PEHSU), and crafted and now coordinate the State-funded Children's Environmental Health Centers of Excellence through their Department of Environmental Medicine and Public Health.<sup>116</sup> They train pediatricians to understand the connection between children's health and environmental factors, including and beyond commonly-identified lead contamination and asthma triggers.

**Pratt University** – Pratt offers degrees in Sustainable Environmental Systems Master's Program within the School of Architecture<sup>117</sup> that is a trans-disciplinary approach to addressing environmental concerns in a built environment.

**Stony Brook University**- Among other things, Stony Brook is home to the Center for Clean Water Technology, whose original mission to drive removal of nitrogen from wastewater, it has expanded to address State-identified "emerging contaminants" in drinking water, including 1,4-dioxane, and perfluorochemicals.<sup>118</sup>

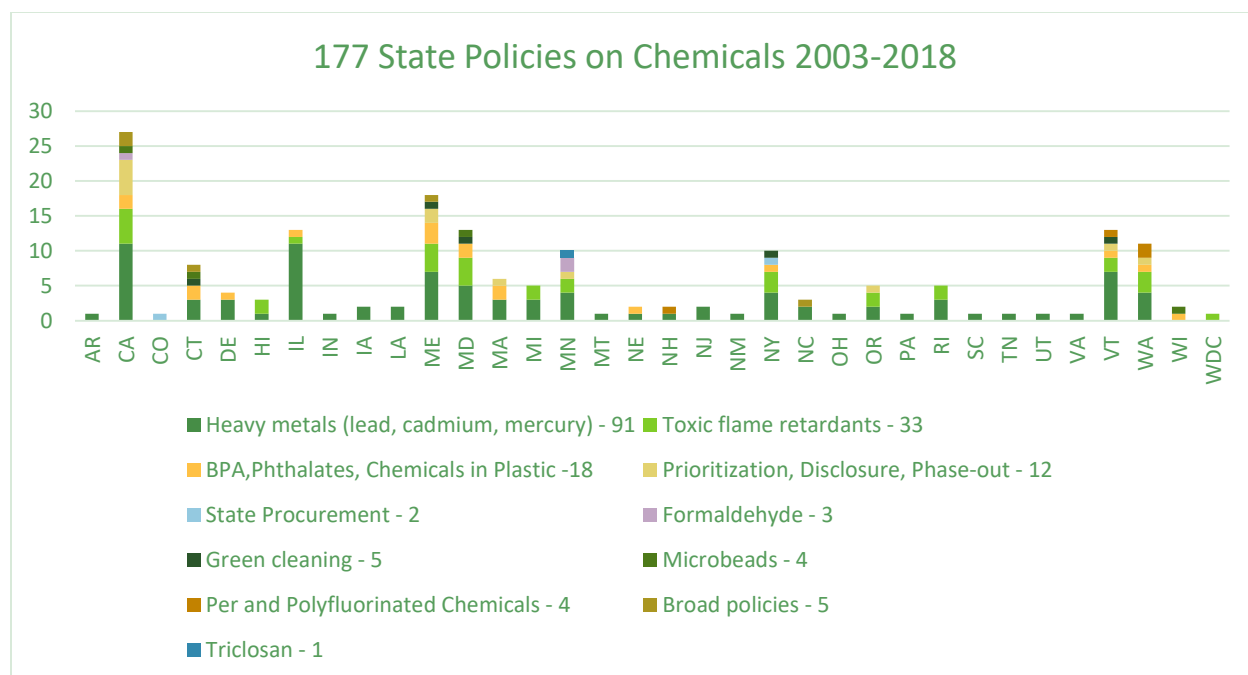
**SUNY Albany** - Among other environmental programs, SUNY Albany is home to the Institute for Health and the Environment,<sup>119</sup> which promotes and supports interdisciplinary research and grants to connect the environment and public health. It is a Pan American Health Organization/World Health Organization Collaborating Centre in Environmental Health.

**University at Buffalo** – The University houses the Department of Materials Design Innovation, which itself has undertaken the "Collaboratory for a Regenerative Economy" (CoRE),<sup>120</sup> which integrates research, education, and entrepreneurship to link materials design and manufacturing technologies with communities and industries to accelerate solutions that restore environmental quality. CoRE is a partnership between the University at Buffalo, Clean Production Action, and Niagara Share.



## LESSONS FROM OTHER STATES

35 states have enacted a total of 178 policies to address toxic chemicals in products and the environment since 2003. The vast majority have been enacted through legislation, with six adopted as Executive Orders. As can be seen from the chart below, many actions focused on one chemical or a group of chemicals.



Some states have innovative strategies to address chemicals beyond single-chemical, specific-product category approaches. The following are examples that New York State could replicate:

**California:** In 1986, the voters of California approved the Safe Drinking Water and Toxic Enforcement Act of 1986, better known as Proposition 65,<sup>121</sup> which requires the labeling of products and locations where such products are used that may expose people to cancer causing chemicals and reproductive and developmental toxicants. It includes provisions that allow individuals and organizations to enforce the law, something significantly different from most other states' laws. Recently, the law changed the required label to provide more information. (See image on this page for the change in language) To implement this law, California created the Office of Environmental Health Hazard Assessment, which analyzes scientific research on chemicals to determine which fall under the law's requirements for labeling. The purpose of the initiative was to

**WARNING:** This product contains a chemical known to the State of California to cause cancer.

**WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

protect the state's drinking water, and illuminates a unique strategy for identifying products that could contribute to harming water if released into the environment.

**Massachusetts:** Their 1999 Toxics Use Reduction Act<sup>122</sup> requires facilities that produce high volumes of toxic chemicals to assess opportunities for toxics use reduction, implement those that are practicable, and track their outcomes. The State provides technical assistance through the Office of Technical Assistance and the Toxic Use Reduction Institute, housed at the University of Massachusetts – Lowell. The State offers grants to underwrite certain toxics- and energy-reducing activities. For fiscal year 2017, facilities adopting OTA's recommendations reported saving \$168,935 and reducing toxic chemicals by 19,341 pounds. New York State could leverage its existing requirement for companies releasing high volumes of air pollutants to submit hazardous waste management plans and connect such polluters with the Pollution Prevention Institute to act on their plans and then require them to chart their progress.

**Washington** – Washington State has enacted a series of laws<sup>123</sup> to address hazardous waste and reduce toxics. They fund this work through the Hazardous Substances Tax, which is applied to bulk hazardous substances brought into the state. They have enacted restrictions on persistent, bioaccumulative toxic chemicals, and maintain a database of chemicals of high concern to children and in what children's products these chemicals are present. They direct a portion of hazardous substances tax to support product testing, and toxic chemical reductions.

Other states across the US have taken action to address chemicals of concern in products, people, and the environment. Most focus on specific chemicals: lead, mercury, cadmium (and others).

## INSPIRATION AND OPPORTUNITY ALL AROUND: GLOBAL ACTION

### United Nations Sustainable Development Goals

In 2015, the United Nations issued an ambitious 15-year plan to address major challenges facing humanity by setting 17 bold goals,<sup>124</sup> including sustainable cities and communities, responsible consumption and production, climate action, and protecting life on land and below water.

Goals that will drive toward safer chemicals include:

**Good Health and Wellbeing:** “3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.”<sup>125</sup>

**Clean Water and Sanitation:** “6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally”<sup>126</sup>

**Industry, Innovation, and Infrastructure:** “9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities”<sup>127</sup>



**Responsible Consumption and Production:** “12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities”<sup>128</sup>

---

## European Action on Harmful Chemicals

The European Union enacted REACH – the Registration, Evaluation, and Authorization of Chemicals – in 2006. It “aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemicals substances... ‘No data no market’: the REACH Regulation places responsibility on industry to manage the risks from chemicals and to provide safety information on the substance.”<sup>129</sup> However, REACH has been slow to fulfill its potential. The non-profit ChemSec reports that there are 181 candidates for Substances of Very High Concern under REACH, but using the same criteria, ChemSec has identified 913 substances for its “Substitute It Now” (SIN) list.<sup>130</sup>

---

## Circular Economy

According to the World Economic Forum, national governments are starting to take actions that would drive circular business models. Particularly, Japan has adopted laws that require efficient uses of resources, materials recovery, and disassembly plants. The Chinese government has been converting industrial parks into “eco-industrial parks” by incentivizing “industrial symbiosis” – where byproducts from one factory get used by another. China has also adopted a Circular Economy Promotion Law. The European Commission has adopted a “Circular Economy Package.”

The following are components of solutions to drive the transition to a circular economy, based on the report “*Towards the Circular Economy: Accelerating the scale-up across global supply chains*.”<sup>131</sup>

- Set up networks to reverse the manufacturing supply chain: instead of focusing on “upcycling” or “downcycling” materials, we need businesses that can take finished, complex products and reuse, maintain, refurbish, and remanufacture them and their components.”<sup>132</sup>
- Reorganize and streamline pure materials flows: the current product supply chain is incredibly complex with numerous materials in any given product. That needs to be streamlined, so materials are simpler and easier to reuse, remanufacture, or melt down and recycle.
- Innovate demand-focused business models: new technologies and approaches are needed to improve communication between businesses in the supply chain, between product makers and users, and back to the reuse and remanufacturing businesses. service providers with the people using them.
- Focus on choosing inherently safe materials from the start.

A circular economy based on an access model of material usage instead of ownership can become exploitive, as product owners or service providers can abruptly change pricing structures or remove products whenever they are no longer profitable. Transition to a circular economy must be supported by public policy that empowers, rather than disenfranchises working people.

## THE ROADMAP FOR NEW YORK STATE

Transforming New York State into a national leader on environmental health requires a roadmap along “complete streets” – just as communities are making space for public transit, cars, bicycles, and pedestrians – there are many modes of travel along the Roadmap to Environmental Health Leadership. The following sections articulate the four major routes to environmental health, and the vehicles for reaching that.

We call for New York State to set bold goals for reducing harmful chemicals, working within government and through business, academic institutions and individuals. New York State should renew its commitment to pollution prevention, green chemistry and engineering, and a sustainable, nontoxic circular economy. The State should demonstrate this commitment by establishing broad, bold goals for reducing use of harmful chemicals in our state, to “turn off the tap” on the flow of these chemicals into workplaces, products, homes, schools, and therefore our bodies, and into the natural resources we and all life rely upon for survival.

### THE FOUR MAJOR ROADS TO ENVIRONMENTAL HEALTH LEADERSHIP



**Transparency:** Throughout the supply chain, purchasers including individuals need to know what is in the materials they buy so they can choose the healthiest option.



**Action** on harmful chemicals and their classes: When credible information indicates that chemicals are hazardous, government and businesses should act to limit their presence.



**Innovation** of inherently safer options: Investment in green chemistry and engineering, identifying solutions built on inherently benign, reusable, repairable, recyclable materials.



**Integration** of chemical considerations into broader definitions of sustainability: The petrochemical industry drives production of gases disrupting our climate, plastic pollution crowding the oceans, and toxic chemicals spreading from the equator to the poles. All rely on the same feedstock. We can only fully transition from a linear supply chain to a circular one when we detoxify the materials within it.

## ADVANCING DOWN THE ROAD: KEY LEADING CONSTITUENCIES

In the following sections, we explore the individuals and entities that can move us to New York's leadership on Environmental Health. Continuing the road metaphor, we consider the following categories.

---

### Public Transit



Government bodies can be slow to act – represented by the greater level of infrastructure needed for an efficient transit system. They can also use their capacity to address environmental injustices, and move historically disproportionately harmed communities toward environmental health and justice.

**State Government:** The *Governor* and the *agencies* he oversees have existing authority to act on chemicals of concern, particularly as air, water, and soil contaminants. Further, the Governor can propose funding of projects within his annual budget, and can propose legislation and seek its advancement when new laws are needed. *Legislators* can advance new policies, and hold hearings on problems to identify solutions. The *Comptroller* can use the State's investment funds to influence corporate behavior, divest from companies unwilling to change, and audit state programs to assess their efficacy. The *Attorney General* can aggressively pursue those who violate restrictions on harmful chemicals, and use legal mechanisms to preserve New York State's right to act in the best interest of its people and environment. She can use funds recouped from successful lawsuits to support green chemistry programs.

**Local Government:** County and city governments can use their procurement authority to choose safer materials, and have some authority over the content of materials sold. They can also pass laws restricting the sale of toxic substances in products.

---

### Freight Vehicles



*Manufactures, retailers, and service-providing businesses* can have a significant impact. They can require transparency about chemicals from their suppliers, driving the transparency all the way up the supply chain. They can establish Restricted Substances Lists that go beyond government requirements, both for the contents of materials they purchase, but also in manufacturing processes. They can track their Chemical Footprint, establish goals for reducing that footprint, and track their progress. They can seek out innovative, green chemistry and engineering solutions for transitioning away from harmful chemicals. They can collaborate with partners along their supply chain or in the same sector to bring innovative solutions to marketable scale.

---

### Buses



*Academic institutions, associations, and non-profit organizations* have important roles.

**Academic institutions** can develop innovative solutions built on green chemistry, and green engineering, with an intention that their solutions are part of a regenerative, circular economy. They can integrate chemical hazard assessment into every part of their innovation and development.

**Business associations** can help members identify the safest solutions, and help transfer knowledge across sectors.

**Non-profit organizations** play a critical role of educating, empowering, and representing the public and its interests, engaging with each of the other “vehicles” on these roads. All of the accomplishments of government and the business community are in part due to pressure from public interest advocates, ranging from small community organizations to large, global NGOs. NGOs connect scientists and their research with government and corporate policy, and with individual choices. They identify problems and accompanying solutions.

---

### Ambulances



*Doctors, nurses, and other health care professionals* are critical to achieving environmental health. They can educate themselves about the impacts of chemicals in their patients’ environments, share preventative strategies with patients and their families, drive changes within their institutions, and know symptoms of chemical exposures when they see them to help prevent further harm. They can advocate for policies that improve the health of their patients by preventing chemical exposures.

---

### Bikes



*Small businesses* do not command the market share that larger companies can, but they are often started to solve a problem left unaddressed by more established businesses. Small businesses can start with the foundation of green chemistry and engineering, and they often serve as laboratories to demonstrate the feasibility of new ideas.

---

### Walkers and Wheelers



*Residents.* Each action taken by a New Yorker can have positive or negative impacts on our common and individual health, but they are, by and large, small steps. Given the ubiquity of toxic chemicals in our daily lives, it simply isn’t possible to shop, eat, or exercise your way out of this problem.





## TRANSPARENCY

*Throughout the supply chain, purchasers including individuals need to know what is in the materials they buy so they can choose the healthiest option.*

Only when one really knows what is in a product, can one fully compare between products and express a market preference. Some consumers may be satisfied with the knowledge that companies are revealing all – transparency itself builds trust and is a feature. Others may seek to choose among products with different sets of ingredients, using their own chemical avoidance list.

As one moves out of the realm of individuals, transparency becomes even more powerful. Retailers with full information about chemicals in products can apply screens to avoid chemicals. Product makers with full information about the contents of the components they purchase can start with safer materials, and choose solutions that aren't simple swaps of one chemical for another (especially true for those who make durable goods, where products are solid articles, like apparel, furniture, and toys). Formulators providing full transparency can respond to business-to-business demand. Chemical producers can benefit from innovating new, safer options.

This transparency must go beyond “intentionally added” chemicals and include byproducts, contaminants, and impurities. This captures, through the supply chain, information about the purity of raw or recycled materials, the use or generation of harmful chemicals in the manufacturing process, and chemicals used in packaging and during transportation (such as fumigants sprayed on furnishings or anti-wrinkling agents applied to apparel).

Government bodies, able to require full lists of chemicals present (including byproducts and contaminants), can use a hazard-based assessment to determine a variety of actions: incentives for innovation of new solutions to materials of concern, restrictions of chemicals in certain products, or in-state production, or, at the very least, assessment and action on these chemicals in waste and drinking water, preferably before there is evidence of harm.

---

### Actions:

**New York State** should reassert the right to know what materials and chemicals are present in our environment and products by establishing sweeping chemical disclosure laws:

- 1) The **legislature** should require disclosure in key consumer products, starting with personal products and children's products.. Other next product categories could include menstrual care products, apparel, and food (including packaging). It should modify the State's definition of confidential business information such that information regarding the names of chemicals that appear on hazard lists are not eligible for confidentiality by the State.
- 2) The **Office of General Services** and **Department of Environmental Conservation** should use their procurement power to prefer products for which full chemical information is disclosed
- 3) As a step to full transparency, children's product manufacturers and brands should be required to disclose chemicals harmful to human health and the environment.

- 4) The **Comptroller** should use its power as an investor of the State Employee Pension Fund to move major companies to conduct Chemical Footprint assessments, adopt restricted substances lists, and develop methods of providing full chemical information to consumers.
- 5) The **Attorney General** must vigorously defend New York State's right to collect information on chemicals in products produced or offered for sale in the state, and oppose efforts to enact federal legislation that would strip this right.
- 6) The **New York State Congressional Delegation** must collectively and individually oppose federal efforts to undermine New York's rights,
- 7) The **Governor** must include adequate staffing at the Departments of Environmental Conservation and Health to oversee programs that involve increased transparency, reporting, and confidential business information claims by regulated companies, and provide sufficient funds to the Interstate Chemicals Clearinghouse to hold information about chemicals in products in shared databases with other states.

Ahead of legal requirement, **businesses** should implement methods to track chemical components of all materials through the supply chain, both internally, and through up- and downstream business-to-business relationships. Companies should track their Chemical Footprint and set goals for reducing harmful chemicals, adopting known safer solutions.

**Health care professionals** should be trained through the Children's Environmental Health Centers of Excellence to identify and treat diseases with environmental contributors, particularly through nursing and pediatrician curriculum. They should be able to talk with patients about prevention methods (including choosing safer products, particularly for pregnant women and babies).

**Individuals** should ask about chemical components in products they buy, and prefer companies that fully disclose this information. They should urge legislators to require such transparency.

Advocacy **organizations** and community groups must share information as it is disclosed, and advocate for corporate and government policies that increase transparency.

---

## **Urgent Policy Action**

The Governor and Legislature must pass Article 7 legislation in the Fiscal Year 2019-2020 Executive Budget requiring full disclosure of chemicals present in all consumer products, and the hazards they pose to human health and the environment.

The Attorney General must vigorously defend the cleaning product ingredient disclosure from the lawsuit filed against the Department of Environmental Conservation by the companies that do not want to provide full information about their products.



## ACTION ON HARMFUL CHEMICALS AND THEIR CLASSES

*When credible information indicates that chemicals are hazardous, government and businesses should act to limit their presence.*

Rather than allowing one harmful chemical to gain attention and action, while very similarly structured, equally concerning, chemicals are moved in as replacements, we need to learn from our experience on the Toxic Treadmill, and drive the national agenda for action on harmful chemicals.

### WHAT'S THE TOXIC TREADMILL?

When one single chemical structure is restricted, but similar, potentially less studied chemicals remain unregulated, chemical manufacturers move to those similar but legally permissible formulations. When scientific research catches up – which can take years – and demonstrates potential harms from the new chemicals, the process repeats. Examples include:

**BPA in receipt paper and drink containers** is replaced with BPS, now shown to be more hormonally active than BPA.

**PBDEs:** penta- and octa-bromodiphenyl ethers caused harm to human health and animals, and persisted in the environment. Efforts to regulate the chemical class faced pushback, as chemical makers argued larger PBDEs molecules would not pose the same threats. It took years to determine decaBDE also entered human and animal bodies, and EPA reached voluntary agreements to end its use. Today, nearly identical decabromodiphenyl ethane remains legal.

---

### Actions

New York State is on the path to leadership. The **Governor and the Legislature** should:

- Create an infrastructure for eliminating harmful chemicals in children's products as part of the Child Safe Products Act.
- Pass legislation to end use of classes of chemicals concern in product sectors, such as organohalogen flame retardants in furniture, electronics, children's products, and bedding, bisphenols in children's products, and PFAS in food packaging and firefighting foam.
- Restrict harmful chemicals in personal care products aimed at communities of color (such as mercury in skin-lightening creams),
- Take a comprehensive approach to addressing current and legacy sources of lead (in paint, soil, water, products) that goes beyond matching federal thresholds for action on children with BLLs at 5 ug/dL or above. This includes investing resources for further remediation in places children live, learn, and play.
- Codify the successful Green Procurement program now operating under Executive Order 4 from 2008 into law, to ensure its continued functioning.
- Acknowledge that the waste from oil and gas refining, as well as petroleum-contaminated soil, is hazardous, not solid waste, to close the "hazardous waste loophole."

The **Governor, and Departments of Environmental Conservation and Health** should not wait for the next set of “emerging chemicals of concern” to contaminate drinking water sources, and must proactively identify a more comprehensive list of chemicals that require monitoring and action:

- Direct the Department of Environmental Conservation to reassess the list of “hazardous substances,” expanding the definition to include chemicals that pose health concerns during use or in new uses following material recycling, and reassessing existing information beyond those chemicals the federal government has identified under CERCLA.
- Provide resources to the Agency to hire the staff necessary for this assessment and changes in regulation, and implementation to follow.
- Ramp up use of Hazardous Waste Reduction Plans to minimize the flow harmful chemicals as inputs, outputs, or processing chemicals. This should include an aggregated periodic report for the public and legislature.
- Empower the Department of Health’s Center for Environmental Health to communicate to the public and physicians about known chemicals of concern, using the lists generated for the Household Cleansing Ingredient Disclosure form.
- Agencies should cease approvals for “Beneficial Uses” of materials composed of harmful chemicals. Beneficial Use Determinations can return materials containing toxic chemicals back into general use, including waste tires as crumb rubber for artificial turf, mulch, and playground surfaces. Instead, agencies should push companies, wherever possible, to ensure products can be returned to beneficial use – recycled – by addressing the chemical composition and production of materials.
- Promote recycling and return of materials to productive use that are not made with harmful chemicals, and direct companies needing disposal of materials containing chemicals of concern to invest in innovative solutions that remove the chemicals of concern from production in the first place.
- Continue to use New York State’s procurement budget as an economic driver.

The **Attorney General** must vigorously enforce violations of the law, and defend New York State’s ability to restrict chemicals within its borders as is necessary to protect human health and the environment.

The **Comptroller** should use his investment power to drive companies to use a Chemical Footprint described in Route 1: Transparency to set and meet measurable goals for reducing demand for, and therefore production of, chemicals of concern to human health and the environment. They should also expand the pool of funds they use to support companies investing in green chemistry solutions and paying attention to materials selection.

**Individuals** should choose products they know are made with inherently safer materials, and those that can last a long time, be safely recycled or composted, and thus returned to a nontoxic, sustainable circular economy.

**Community groups and advocacy organizations** should access information about harmful chemicals and safer solutions and share this information with the public. They should continue to advocate for the changes described above. They should provide accountability by testing products and revealing

those that contain chemicals of concern. They should also promote independent, third-party certification programs that identify products made without chemicals of concern.

**Small businesses** and entrepreneurs must continue to seek new solutions, develop solutions, and make products that fit within a nontoxic, sustainable and just circular economy.

---

### **Urgent Policy Action**

The Governor and Legislature must pass new Article 7 budget legislation requiring full disclosure of chemicals present in all consumer products, particularly those to which a pregnant woman or child may be exposed, as well as the hazards such chemicals pose to public health and the environment.

The Governor and Legislature must also pass new Article 7 budget legislation that lowers the definition of elevated pediatric blood lead to 5 ug/dL.

The Legislature must pass legislation addressing chemical classes in products, including organohalogens, bisphenols and per- and poly-fluorinated chemicals.



### INNOVATION OF INHERENTLY SAFER OPTIONS

*Investment in green chemistry and engineering, identifying solutions built on inherently benign, reusable, repairable, recyclable materials.*

“Innovation” is a popular word right now. But any innovative design or process that does not fit into a nontoxic, sustainable, just and circular economy will have to be redesigned at some point. Otherwise, today’s innovations create tomorrow’s problems. New York State has recently focused economic development funds on technology companies producing “innovative” products or processes. Instead of pouring money into an interim solution, New York State should promote long-term problem solving, to support innovations and solutions that will last for generations.

What is necessary for transformative innovation is development and use of inherently benign materials designed with their return to a productive economy in mind. If they need to be durable, they should design for ease of repair, and disassembling at the end of product life for recycling. If they need to be temporary, they should design for recycling or return to the earth as a nutrient. Base materials shouldn’t rely on the extractive, linear economy. All the materials throughout the product life (including for packaging and repair) must likewise be able to return safely to productive use.

Here’s how the World Economic Forum summarized the need for a circular economy: “Estimates suggest that the global population will reach close to 9 billion by 2030 – including 3 billion new middle-class consumers. This places unprecedented pressure on natural resources to meet future consumer demand. The circular economy is a redesign of this future, where industrial systems are restorative and regenerative by intention. Nothing made in a circular economy becomes waste, moving away from our current linear ‘take-make-dispose’ economy. The circular economy’s potential for innovation, job creation and economic development is huge: estimates indicate a trillion-dollar opportunity.”<sup>133</sup>

New York State can lead this innovation of solutions to meet a nontoxic, sustainable circular economy in the following ways:

The **legislature** can codify the state’s Green Procurement program into law, increase requirements for agency compliance with making purchases conforming to green specifications, and sharpen the focus on specification criteria that limit greenhouse gas emissions and harmful chemicals. This will help accelerate the market transition to inherently safer materials.

**Governor Cuomo** should issue an Executive Order on Green Chemistry, building on those enacted in Oregon, Minnesota, and Michigan, to move our state beyond preventing harmful chemicals from entering the environment (pollution prevention) to innovating solutions that meet society’s needs with chemicals that can safely return to industry or the earth for regeneration. This Executive Order should also build upon the two five-year roadmaps developed by a large consortium of government and non-government organizations in the Pacific Northwest, led by the State of Washington.

They identified the following categories of actions:

- 1) **“Fund research and establish a green chemistry technology center.”**<sup>134</sup> New York State embedded requirements for the New York State Pollution Prevention Institute to include work to

address “emerging chemicals of concern” and “green chemistry.” This is an important step. However, it should devote additional resources to address green chemistry solutions that are important to support growing economic sectors within the State. Food production is one area where the State has already provided support, and could be a starting sector.

- 2) **“Enhance research and education opportunities.”** New York is home to world-class science and engineering schools. However, very few offer a focus on green chemistry and engineering. Academic institutions should support and encourage the next generation of innovators by making green chemistry and engineering an overt focus, and incorporating those principles into its mainstream chemistry and engineering programs. The State should invest resources into expanding and promoting the Department of Environmental Conservation’s green chemistry curriculum training for K-12 educators that it developed under a grant from the US Environmental Protection Agency.
- 3) **“Promote safer chemicals, processes, and product innovation.”** New York State’s Pollution Prevention Institute is well-positioned to promote this, and is already connected to key national coalitions that advance green chemistry and innovation, including the Green Chemistry and Commerce Council (GC3), BizNGO, and the Interstate Chemicals Clearinghouse. The P2I should help companies conduct alternatives assessments on known harmful chemicals.

The **Department of Environmental Conservation** enforcement staff should promote green chemistry resources to the entities they regulate. The DEC should ensure all Green Business companies incorporate green chemistry considerations before becoming a member of the State’s program. As the State catches up to others regarding promoting safer solutions, it should draw upon numerous existing tools, including the GreenScreen, and the Interstate Chemicals Clearinghouse’s Alternative Assessment guidance.

In the past, NYS has awarded businesses and others with Pollution Prevention awards, and then broadened them to “Environmental Excellence Awards.” The State should include at least one award a year for companies leading the way using green chemistry and engineering, and for fitting into a nontoxic, sustainable, circular economy.

The state academic institutions should direct their energies into nontoxic, sustainable, circular economy-focused solutions. Some already are, such as the Materials Design and Innovation Department at SUNY Buffalo.<sup>135</sup>

- 4) **“Accelerate Economic Development and Workforce Training”<sup>136</sup>** New York’s post-secondary academic institutions should integrate green chemistry and engineering principles into their mainstream courses, so that new chemists and engineers integrate considerations of hazard and identification of safer solutions into their overall approach. New York State Department of Environmental Conservation should continue to educate elementary and secondary level educators about green chemistry.

In the recent past, the Environmental Facilities Corporation provided grants through its Environmental Investment Program, which has now ended. New York State should revive this



program and incorporate criteria to drive use of inherently safer materials and processes into all grant and loan funds that support innovation.

Economic development funds should include criteria for consideration that address transparency, reduction of known hazards, and investment in innovations that fit within a nontoxic, sustainable circular economy framework, to raise awareness and drive companies seeking economic development support to consider these issues. The State should insert green innovation explicitly into Centers for Advanced Technology.<sup>137</sup>

- 5) **“Green Chemistry Policy Options.”** Recommendations that would benefit New York State that the **legislature** should advance include: incentives to promote green chemistry and promotion of procurement policies that incentivize nontoxic products. (see Route 1: Transparency).
- 6) **“Establish a Green Nanotechnology Partnership.”** Ensuring nanotechnology is environmentally benign is especially important in New York State, with so much investment in the nanotechnology industry. New York State should work to build a consortium of academic, business, NGO, and government bodies to ensure New York’s nanotech investment is “green” – so that this new industrial revolution does not lead to the same harm to human health and environment that the last revolution did.
- 7) **“Green Chemistry Program Support.”** New York State must revive and refocus existing support programs established in law: Revive and refocus the Pollution Prevention Coordinating Council to promote pollution prevention, green chemistry innovation, and preparation to fit into a nontoxic, sustainable and just circular economy across state agencies to reduce production and use of harmful chemicals and support innovation.

---

### **Urgent Policy Action**

The legislature and the Governor should codify the State’s Green Procurement program. Executive Staff should draft and the Governor should sign a Green Chemistry Executive Order, integrated with other State environmental and energy goals (see Route 4 below).



## INTEGRATION OF CHEMICAL CONCERNS INTO SUSTAINABILITY AND THE CIRCULAR ECONOMY

*The petrochemical industry drives production of gases disrupting our climate, plastic pollution crowding the oceans, and toxic chemicals spreading from the equator to the poles. All rely on the same feedstock. We can only fully transition from a linear supply chain to a circular one when we detoxify the materials within it.*

It is not enough to end extraction of oil, gas, and coal for energy production. As the world invests in renewable energy sources, petrochemical companies are turning more to producing plastics and synthetic chemicals. This is also driven in the US by shale gas, extracted primarily by hydrofracking, which requires toxic inputs. As we can expect that companies will continue to extract fossil fuels – coal, petroleum, gas – and seek markets, they will need customers, and synthetic chemistry is a known large downstream user.

The broader Sustainability movement has focused on meeting the needs of today without compromising the ability to meet needs in the future. This has focused on having energy sources that continue to be available, on addressing climate change, and on reducing use of non-renewable resources in general. It must incorporate considerations of the toxicity of materials in use, because they will be the feedstock of the future, and because our current reliance on harmful chemicals has resulted in its spread to the far reaches of the globe. Harmful chemicals have no place in a society that can be truly regenerating and renewing.

New York State needs to renew its commitment to pollution prevention, green chemistry and engineering, and a sustainable, nontoxic circular economy. This commitment must be demonstrated by establishing broad, bold goals to reduce harmful chemicals, to “turn off the tap” on their flow into workplaces, products, homes, schools, and therefore our bodies, and into the natural resources we and all life rely upon for survival.

**Businesses** should look holistically at their environmental footprint, and set goals for all impacts. They should seek to understand the connections between the feedstock of products they make or use, climate change, and impacts on human health and the environment. Green business associations should explicitly incorporate consideration of chemical inputs and outputs as part of their definition of “green.”

**Organizations** should recognize the common drivers of climate change, plastic pollution, and the impacts of chemicals, and use that to leverage policy change.

**Academic institutions** should embed toxicology and consideration of the impacts of materials into programs for chemistry, biology, medicine, engineering, business management, and more. Programs that focus on “sustainability” or “green economy” should ensure consideration of toxicity and chemical impact within the full lifecycle of materials is incorporated into curricula.

The **Pollution Prevention Institute** can help connect dots between agencies by providing space during advisory board meetings for each agency to connect the pollution prevention and green chemistry work to the goals of their agencies. This would stand in for the now-defunct Pollution Prevention and Environmental Compliance Coordinating Council, and could offer a lively space for meaningful

implementation of integrated considerations into each agency and authority that participates and provides input. That is, feedback and strategizing could both guide the Pollution Prevention Institute and guide agency and authority staff.

---

**Urgent Policy Action**

The Governor should merge Executive Order 4 with Executive Order 66 on climate and energy.

## APPENDICES

### APPENDIX A: CHARTING THE COURSE – THE MAKING OF THE ROADMAP

The task of crafting a Roadmap for Environmental Health Leadership is major. There are many ways to define “Environmental Health” and many issues to highlight within that broad category. We are forever grateful for the partner organizations, old and new, and content experts who participated in two rounds of meetings across the state. But more than that, Clean and Healthy New York has operated on two related principles since our founding: “Together, we win” and “If you want to go fast go alone, but if you want to go far, go together.” We have been informed, inspired, and energized by our colleagues across the state and around the nation.

Since 2007, the JustGreen Partnership has formed the core collaborative for work on toxics in New York. Steering Committee members, in particular, have been key allies. Therefore, even before we began outlining the Roadmap, we were grounded in the knowledge and experience of Cecil Corbin-Mark, Deputy Director (WEACT for Environmental Justice), Karen Joy Miller, Founder (Huntington Breast Cancer Action Coalition), Attorneys Eve Gartner and Deborah Goldberg (Earthjustice), Director of Community Outreach Paul Webster and Health and Safety Specialist Wendy Hord (New York State United Teachers), Laura Weinberg, President (Great Neck Breast Cancer Coalition), Christine Appah, Senior Staff Attorney (NY Lawyers for the Public Interest), Josh Klainberg, Senior Vice President, (NY League of Conservation Voters), Bob Rossi, Director (NY Sustainable Business Council), Caitlin Ferrante, Conservation Director (Sierra Club Atlantic Chapter), former Directors Stephen Boese and Heather Loukmas (Learning Disabilities Association of NYS), Russ Haven, Legal Counsel (NYPIRG) and Tom Lowe, Health and Safety Representative (formerly of NYS Nurses Association).

As part of the process of crafting this Roadmap, last summer CHNY convened six strategy discussions with 75 thought leaders from 56 organizations in Buffalo, Rochester, Albany, the Hudson Valley, New York City and Long Island. They represent a wide variety of perspectives: academia, education, health care, business, agriculture, labor, environmental health, environmental justice, community, and those whose health has been affected. Together, we brainstormed about where things stand now, and the actions New York needs to take to achieve the most sweeping and strategic environmental health/disease prevention policies. In each of these sessions, people engaged enthusiastically and committed to next steps.

It was clear from these discussions that there are many and varied challenges to address: legacy pollution, inadequate enforcement, chemicals contaminating our water and air, and a wide range of chemicals that expose people to health threats on a daily basis. Also clear is the need to fill knowledge gaps, innovate, and join forces to achieve success in eliminating the ill effects to our communities, families and children that toxic chemicals cause.

What is contained in this Roadmap builds on this breadth and depth of knowledge. We gratefully acknowledge the wisdom and memory of our colleagues, old and new. Any errors or omissions are our own. This is a living document. Please feel free to provide feedback to Bobbi Wilding, Deputy Director at [bobbi@cleanhealthyny.org](mailto:bobbi@cleanhealthyny.org).

## APPENDIX B: ORGANIZATIONS IN THE JUSTGREEN PARTNERSHIP

The JustGreen Partnership formed in 2007, and for over a decade has been a dynamic, collaborative model for organizations with diverse missions and constituencies to advance policies for the good of all. The following organizations are members of the JustGreen Partnership as of January 2019 (organizations in bold are Steering Committee members):

Alliance @ IBM

Alliance of Nurses for Healthy Environments

American Academy of Pediatrics, New York State, Chapters 1, 2 & 3

American Sustainable Business Council

Arbor Hill Environmental Justice

Association of Comparative and Environmental Toxicology Students

Breast Cancer Coalition of Rochester

Cancer Resource Center of the Finger Lakes

Center for Environmental Health

Center for Health, Environment & Justice

Citizens Campaign for the Environment

Citizens' Environmental Coalition

Clean Air Coalition of Western New York

**Clean and Healthy New York**

Clean Production Action

Coalition to End Lead Poisoning

Communication Workers of America Local 1701

Community Action Organization – Center for Environmental Justice

Community Health & Environment Coalition of Long Island

**Earthjustice**

Environmental Justice Action Group of Western New York

Faces of Astarte

Garrison Institute

**Great Neck Breast Cancer Coalition**

Green Inside and Out Consulting

Healthy Schools Network

**Huntington Breast Cancer Action Coalition**

Institute for Health and the Environment at SUNY Albany

Learning Disabilities Association of New York State

Mira's Movement

Moms Clean Air Force

Moms for a Nontoxic New York

NARAL Pro Choice New York

Natural Resources Defense Council

New York City Environmental Justice Alliance

New York Committee on Occupational Safety and Health

**New York Lawyers for the Public Interest**

**New York League of Conservation Voters**

New York Public Interest Research Group

New York State Nurses Association

**New York Sustainable Business Council**

**New York State United Teachers**

Northeast New York Coalition for Occupational Safety and Health

Parents Against Lindane

Planned Parenthood of the Southern Finger Lakes

Prevention is the Cure

**Sierra Club Atlantic Chapter**

Seventh Generation, Inc.

United Steelworkers, District 4

**WEACT for Environmental Justice**

Western New York Council on Occupational Safety and Health

## APPENDIX C: FEDERAL LAWS

Federal laws governing action to protect human health and the environment, especially as it pertains to harmful chemicals:

### Harmful Chemicals

---

- Chemical Safety Information, Site Security and Fuels Regulatory Relief Act
- Emergency Planning and Community Right-to-Know Act (EPCRA); 42 U.S.C. 11011 et seq. (1986)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund) ; 42 U.S.C. s/s 9601 et seq. (1980), and the Superfund Amendments and Reauthorization Act (SARA); 42 U.S.C.9601 et seq. (1986)
- Federal Hazardous Substances Act
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); 7 U.S.C. s/s 135 et seq. (1972), and the Pesticide Registration Improvement Act (PRIA)
- Resource Conservation and Recovery Act (RCRA) ; 42 U.S.C. s/s 321 et seq. (1976)
- Safe Drinking Water Act (SDWA); 42 U.S.C. s/s 300f et seq. (1974)
- Toxic Substances Control Act (TSCA); 15 U.S.C. s/s 2601 et seq. (1976)

### Human Health

---

- Biomedical Research Extension Act (mandates Report on Carcinogens); Pub. Law 95-622 (1978)
- Breast Cancer and Environmental Research Act (44KB) ; Pub. Law 110-354 (2008)
- Combating Autism Act ;Pub. Law No. 109-416 (2006)
- EO 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045: Protection of Children from Environmental Health Risks and Safety Risks
- Occupational Safety and Health Act (OSHA); 29 U.S.C. 651 et seq. (1970)
- Patient Protection and Affordable Care Act , Pub. Law 111-148 (2010)
- Public Health Service Act ; 42 USC sections 241 and 2851

### Pollution

---

- Atomic Energy Act (AEA)
- National Environmental Policy Act (NEPA); 42 U.S.C. 4321-4347
- Clean Air Act (CAA); 42 U.S.C. s/s 7401 et seq. (1970)
- Clean Water Act (CWA); 33 U.S.C. ss/1251 et seq. (1977)
- Marine Protection, Research, and Sanctuaries Act (MPRSA, also known as the Ocean Dumping Act)
- National Technology Transfer and Advancement Act (NTTAA)
- Nuclear Waste Policy Act (NWPA)
- Oil Pollution Act (OPA)
- Pollution Prevention Act (PPA) ; 42 U.S.C. 13101 and 13102, s/s et seq. (1990)

### Products

---

- Consumer Product Safety Act and the Consumer Product Safety Improvement Act
- Federal Food, Drug, and Cosmetic Act (FFDCA) ; 21 U.S.C. 301 et seq.
- Food Quality Protection Act (FQPA); Pub. Law 104-170, (1996)

## APPENDIX D: OTHER STATES' CHEMICALS POLICY

The following is information about chemicals restricted in products in other states that are still allowed to be sold here in New York. It is extracted from the information presented at the Safer States website.<sup>138</sup>

---

### PLASTIC ADDITIVES

**Bisphenol A (BPA)** is banned in **CT**, **ME**, **VT**, and **WA** in water bottles, and in **CT** in thermal receipt paper.

**Phthalates** are banned in **WA** in children's products. Certain ones (DEHP, BBP) are banned in **CA** and **VT** in toys or child care articles. DINP, DIDP, and DnOP are banned in **CA** and **VT** in children's toys or products small enough to fit in a child's mouth.

---

### HEAVY METALS

**Antimony** is banned in **CA** in toys, and in **MN** in children's products and upholstered residential furniture, residential textiles, and mattresses.

**Arsenic** is banned in **CA** in toys.

**Barium** is banned in **CA** in toys or toy packaging.

**Cadmium** is banned in children's jewelry in **CA**, **CT**, **MD**, **MN**, and **WA**, and in toys or toy packaging and motor vehicle brake friction materials in **CA**.

**Chromium (VI)-Salts** are banned in **CA** in motor vehicle brakes and toys or toy packaging.

**Copper** is banned in **CA** in vehicle brake friction materials.

**Lead** in jewelry is banned in **CA**, **MD**, **MN**, and **VT**; in children's products in **CA**, **CT**, **MD**, **MI**, **VT**, and **WA** in children's products; in children's jewelry and lunch boxes in **MI**; in toys or toy packaging in **CA**, **MD**, and **MI**; in motor vehicle brake friction materials in **CA**; in solder or flux or plumbing fixtures and nonresidential paints or primers in **VT**; and in paint in **CT**.

**Mercury** is banned in health care, vehicles, lights, in **many states**, overlapping with NY laws.

**Selenium** is banned in **CA** in toys or toy packaging.

---

### FLAME RETARDANTS

**All flame retardant** chemicals are banned in **ME** in upholstered residential furniture and in **CA** in residential upholstered furniture, children's products, and mattress foam.

**Organohalogen flame retardant chemicals** (bromine or chlorine bonded to carbon) are banned in **RI** in upholstered residential furniture and mattresses.

**Brominated flame retardants (BFRs)** are banned in **ME** in consumer products.

**Decabromodiphenyl ether (decaBDE)** is banned in **ME** and **VT** in plastic shipping pallets; in **MD**, **MN**, **VT**, and **WA** in upholstered residential furniture; in **MD**, **MN**, and **VT** in mattress/ mattress pads; in **MD** in electrical or electronic equipment and military equipment; in **MD** and **OR** in transportation equipment; in **MN** and **WA** in children's products; in **VT** in televisions and computers with plastic



housing; in **MN** in residential textiles. There is a national voluntary production and import ban agreement between US EPA and major importers, but evidence of ongoing production and import by smaller producers remains.

**Polybrominated diphenyl ethers (PBDE)** are banned in **WA** in consumer products, mattress/ mattress pads, upholstered furniture, and televisions or computers with plastic housing.

**Tetrabromo phthalate (TBPH), Tetrabromo benzoate (TBB), Tris(2-chloro-1-methylethyl) phosphate "TCPP", and Chlorinated paraffins** are banned in **MN** in children's products, upholstered residential furniture, residential textile and mattresses.

**Tetrabromobisphenol A (TBBPA) and Hexabromocyclododecane (HBCD)** is banned in **MN** and **WA** in children's products and upholstered residential furniture; and in **MN** in residential textile, and mattresses.

**Tris(1,3-dichloro-2-propyl) phosphate "TDCPP" and Tris(2-chloroethyl) phosphate "TCEP"** is banned in **MN, VT, and WA** in upholstered residential furniture; and in **MN** in residential textile and mattresses. **NY** only restricts these chemicals in children's products.

---

#### OTHER

**Asbestiform** fibers are banned in **CA** in motor vehicle brake friction materials.

**Formaldehyde** is banned in Minnesota in children's products.

**Perfluorooctanesulfonic acid (PFOS)** are banned in Washington in food packaging and class B firefighting foam.

**Triclosan** is banned in Minnesota in cleaning products and body cleansing products.

## REFERENCES

- <sup>1</sup> “Chemical and Materials Industry: Summary” World Economic Forum. [toplink.weforum.org/knowledge/insight/a1Gb0000000pTDfEAM/explore/summary](https://toplink.weforum.org/knowledge/insight/a1Gb0000000pTDfEAM/explore/summary) (as of 1/24/2019, requires free log-in)
- <sup>2</sup> United States Census Bureau, [www.census.gov](http://www.census.gov) (as of 1/15/2019)
- <sup>3</sup> Total asthma emergency department visit rate per 10,000,” New York State Department of Health, August, 2019, [www.health.ny.gov/statistics/ny\\_asthma/data/2016eh/a20.htm](http://www.health.ny.gov/statistics/ny_asthma/data/2016eh/a20.htm) (as of 1/15/2019)
- <sup>4</sup> “New York State Education at a Glance” NYS Department of Education. [data.nysed.gov/](http://data.nysed.gov/) (as of 1/24/2019)
- <sup>5</sup> “Children with Disabilities Receiving Special Education Programs & Services Data Summaries.” NYS Department of Education. Data from October 2016. [www.p12.nysed.gov/sedcar/goal2data.htm](http://www.p12.nysed.gov/sedcar/goal2data.htm) (As of 1/24/2019)
- <sup>6</sup> NYS Cancer Registry. “Cancer Incidence and Mortality in New York State, 1976-2015.” [www.health.ny.gov/statistics/cancer/registry/](http://www.health.ny.gov/statistics/cancer/registry/) (As of 1/17/2019)
- <sup>7</sup> “Environmental Contributors to Cardiovascular Disease: Emerging Research on Heavy Metals and Air Pollution,” Collaborative on Health and the Environment, September 25, 2018, [www.healthandenvironment.org/webinars/96445](http://www.healthandenvironment.org/webinars/96445), (as of 1/14/2019)
- <sup>8</sup> “Chemical Innovation: Technologies to Make Processes and Products More Sustainable,” US Government Accountability Office, March 12, 2018, <https://www.gao.gov/products/GAO-18-307>, (as of 1/14/2019)
- <sup>9</sup> University of Hawaii at Manoa. “Degrading plastics revealed as source of greenhouse gases,” Science Daily, University of Hawaii at Manoa, August 1, 2018, [www.sciencedaily.com/releases/2018/08/180801182009.htm](http://www.sciencedaily.com/releases/2018/08/180801182009.htm), (as of 1/15/2019).
- <sup>10</sup> Fiona Harvey and Jonathan Watts, “Microplastics found in human stools for the first time” *The Guardian* [www.theguardian.com/environment/2018/oct/22/microplastics-found-in-human-stools-for-the-first-time](http://www.theguardian.com/environment/2018/oct/22/microplastics-found-in-human-stools-for-the-first-time) (as of 1/24/2019)
- <sup>11</sup> Chunyang Liao and Kurunthachalam Kannan “Widespread Occurrence of Bisphenol A in Paper and Paper Products: Implications for Human Exposure” *Environmental Science & Technology* 45(21):372-9 September 2011. [www.researchgate.net/publication/51662822\\_Widespread\\_Occurrence\\_of\\_Bisphenol\\_A\\_in\\_Paper\\_and\\_Paper\\_Products\\_Implications\\_for\\_Human\\_Exposure](http://www.researchgate.net/publication/51662822_Widespread_Occurrence_of_Bisphenol_A_in_Paper_and_Paper_Products_Implications_for_Human_Exposure) (as of 1/24/2019)
- <sup>12</sup> Strakova, Jitka & DiGangi, Joe & Watson, Alan. “A survey of PBDEs in recycled carpet padding.” 2011 73. 2067-2070. [https://www.researchgate.net/publication/327137331\\_A\\_survey\\_of\\_PBDEs\\_in\\_recycled\\_carpet\\_padding](https://www.researchgate.net/publication/327137331_A_survey_of_PBDEs_in_recycled_carpet_padding) (as of 1/24/2019)
- <sup>13</sup> University of Plymouth, “Recycled electrical products lead to hazardous chemicals appearing in everyday items” *ScienceDaily* May 30, 2018 [www.sciencedaily.com/releases/2018/05/180530113134.htm](http://www.sciencedaily.com/releases/2018/05/180530113134.htm) (as of 1/24/2019)
- <sup>14</sup> M.B. McBride, “Toxic metals in sewage sludge-amended soils: has promotion of beneficial use discounted the risks?” *Advances in Environmental Research* November 2002 [www.sourcewatch.org/images/2/22/McBride\\_-\\_Toxic\\_Metals\\_in\\_Sludge.pdf](http://www.sourcewatch.org/images/2/22/McBride_-_Toxic_Metals_in_Sludge.pdf) (as of 1/24/2019)
- <sup>15</sup> Lauren Phipps, “Safe and round: How healthier materials factor into a circular economy,” *Green Biz*, September 24, 2018. <https://www.greenbiz.com/article/safe-and-round-how-healthier-materials-factor-circular-economy> (as of 1/24/2019)
- <sup>16</sup> “From linear to circular – Accelerating a proven concept,” *World Economic Forum*, [reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/](https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/) (as of 1/15/2019)
- <sup>17</sup> Zhang et al, “Long-term trends in the ambient PM<sub>2.5</sub> and O<sub>3</sub>-related mortality burdens in the United States under emission reductions from 1990 to 2010” *Atmospheric Chemistry and Physics* volume 18, pp 15003-15016 [www.atmos-chem-phys.net/18/15003/2018/](http://www.atmos-chem-phys.net/18/15003/2018/) (as of 1/15/2019)
- <sup>18</sup> “Fatality Analysis Reporting System Encyclopedia,” *National Highway Traffic Safety Administration*, [www.fars.nhtsa.dot.gov/Main/index.aspx](http://www.fars.nhtsa.dot.gov/Main/index.aspx), January, 15 2019.
- <sup>19</sup> Kate Aronoff, “The Fossil Fuel Industry Spent \$100 Million to Kill Green Ballot Measures in Three States – And Won” *The Intercept* November 7, 2018 [theintercept.com/2018/11/07/midterm-elections-green-ballot-measures-fossil-fuel/](http://theintercept.com/2018/11/07/midterm-elections-green-ballot-measures-fossil-fuel/) (as of 1/24/2019)
- <sup>20</sup> U.S. EPA. “Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-P-Dioxin (Tcdd) and Related Compounds National Academy Sciences (External Review Draft) (2004).” U.S. Environmental Protection Agency, 2004 [cfpub.epa.gov/ncea/risk/recorddisplay.cfm?deid=87843](http://cfpub.epa.gov/ncea/risk/recorddisplay.cfm?deid=87843) (as of 1/24/2019)
- <sup>21</sup> “Hazardous Air Pollutants,” *United States Environmental Protection Agency*, [www.epa.gov/haps](http://www.epa.gov/haps) (as of 1/15/2019)
- <sup>22</sup> *Ibid*.
- <sup>23</sup> Sharon Lerner, “Toxic “Reform” Law Will Gut State Rules on Dangerous Chemicals,” *The Intercept*, January 11, 2016. <https://theintercept.com/2016/01/11/toxic-reform-law-would-gut-state-rules-on-dangerous-chemicals/>
- <sup>24</sup> Coral Davenport and Roni Caryn Rabin, “E.P.A. Places the Head of Its Office of Children’s Health on Leave” *New York Times*. September 26, 2018. [www.nytimes.com/2018/09/26/climate/epa-etzel-children-health-program.html](http://www.nytimes.com/2018/09/26/climate/epa-etzel-children-health-program.html) (as of 1/24/2019)
- <sup>25</sup> Joseph H. Guth, “Introduction To Toxic Substance Control Act of 1976,” *Science and Environmental Health Network*, April 30, 2006, [sehn.org/wp-content/uploads/2013/01/TSCASummary.pdf](http://sehn.org/wp-content/uploads/2013/01/TSCASummary.pdf) (1/15/2019)
- <sup>26</sup> “Laws and Regulations,” *United States Department of Labor Occupational Safety and Health Administration*, [www.osha.gov/law-regs.html](http://www.osha.gov/law-regs.html) (as of 1/15/2019)
- <sup>27</sup> “Chemical Hazards and Toxic Substances,” *United States Department of Labor Occupational Safety and Health Administration*, [www.osha.gov/SLTC/hazardoustoxic-substances/index.html](http://www.osha.gov/SLTC/hazardoustoxic-substances/index.html) (as of 1/15/2019)
- <sup>28</sup> “Transitioning to Safer Chemicals: A Toolkit for Employers and Workers,” *OSHA Training Institute Education Centers*, <https://blog.osha4you.com/resources/transitioning-to-safer-chemicals-a-toolkit-for-employers-and-workers/>, (as of 1/15/2019)
- <sup>29</sup> Popovich et al, “78 Environmental Rules on the Way Out Under Trump,” *The New York Times*, October 5, 2017, [www.nytimes.com/interactive/2017/10/05/climate/trump-environment-rules-reversed.html](http://www.nytimes.com/interactive/2017/10/05/climate/trump-environment-rules-reversed.html), (as of 1/15/2019)

- 30 "State Superfund Sites," *New York State Department of Environmental Conservation*, [www.dec.ny.gov/chemical/8439.html](http://www.dec.ny.gov/chemical/8439.html), January 15, 2019.
- 31 "What Do Parents Need to Know to Protect Their Children?" *US Centers for Disease Control and Prevention* October 30, 2012. [www.cdc.gov/nceh/lead/acclpp/blood\\_lead\\_levels.htm](http://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm) (as of 1/24/2019)
- 32 "Controlling Sources of Toxic Air Pollutants," *New York State Department of Environmental Conservation*, [www.dec.ny.gov/chemical/89934.html](http://www.dec.ny.gov/chemical/89934.html) (as of 1/15/2019)
- 33 "Chapter III – Air Resources," *NYS Department of Environmental Conservation*, [www.dec.ny.gov/regs/2492.html](http://www.dec.ny.gov/regs/2492.html), January 15, 2019.
- 34 "Drinking Water Protection Program," *New York State Department of Environmental Conservation*, [www.health.ny.gov/environmental/water/drinking/](http://www.health.ny.gov/environmental/water/drinking/), January 15, 2019.
- 35 "Drinking Water Quality Council Recommends Nation's Most Protective Maximum Contaminant Levels for Three Unregulated Contaminants in Drinking Water," *New York State Department of Health*, December 2018, [www.health.ny.gov/press/releases/2018/2018-12-18\\_drinking\\_water\\_quality\\_council\\_recommendations.htm](http://www.health.ny.gov/press/releases/2018/2018-12-18_drinking_water_quality_council_recommendations.htm), January 15, 2019.
- 36 "New York Consolidated Laws, Environmental Conservation Law – ENV § 37-0103. Lists of substances hazardous or acutely hazardous to public health, safety or the environment," *Find Law*, [codes.findlaw.com/ny/environmental-conservation-law/env-sect-37-0103.html](http://codes.findlaw.com/ny/environmental-conservation-law/env-sect-37-0103.html), January 15, 2019.
- 37 Conversation with Russ Brauksieck, Division of Environmental Remediation, Department of Environmental Conservation on December 10, 2018
- 38 "Revised Regulatory Impact Statement Summary – 6 NYCRR Part 597," *New York State Department of Environmental Conservation*, [www.dec.ny.gov/regulations/105079.html](http://www.dec.ny.gov/regulations/105079.html), (As of 1/15/2019)
- 39 "Beyond Waste," *NYS Department of Environmental Conservation*, [Page 1] December 27, 2010. [www.dec.ny.gov/docs/materials\\_minerals\\_pdf/frptbeyondwaste.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf) (As of 1/1/5/2019)
- 40 Ibid.
- 41 "Beyond Waste," *NYS Department of Environmental Conservation*, [Page 27] December 27, 2010. [www.dec.ny.gov/docs/materials\\_minerals\\_pdf/frptbeyondwaste.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/frptbeyondwaste.pdf) (As of 1/1/5/2019)
- 42 Analysis based on charts produced by Friends of New York's Environment, kept on file at CHNY offices. Current budget is available at <http://www.keepprotectingny.com/the-epf/state-budget>
- 43 "New York Consolidated Laws, Environmental Conservation Law – ENV § 28-0101. Declaration of policy," *Find Law*, [codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0101.html](http://codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0101.html), (as of 1/15/2019)
- 44 New York Consolidated Laws, Environmental Conservation Law – ENV § 28-0107. Powers and duties of the department," *Find Law*, [codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0107.html](http://codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0107.html), (as of 1/15/2019).
- 45 "New York Consolidated Laws, Environmental Conservation Law – ENV § 28-0109. Small business pollution prevention and environmental compliance assistance program," *Find Law*, [codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0109.html](http://codes.findlaw.com/ny/environmental-conservation-law/env-sect-28-0109.html), (as of 1/15/2019).
- 46 "Small Business Environmental Assistance Program," *New York State Environmental Facilities Corporation*, [www.efc.ny.gov/SBEAP](http://www.efc.ny.gov/SBEAP), (as of 1/15/2019).
- 47 *New York State Pollution Prevention Institute*, [www.nysp2i.rit.edu](http://www.nysp2i.rit.edu), (as of 1/15/2019).
- 48 "2018 Available CFA Resources," *Regional Economic Development Councils*, [regionalcouncils.ny.gov/sites/default/files/2018-04/2018ResourcesAvailableGuide\\_0.pdf](http://regionalcouncils.ny.gov/sites/default/files/2018-04/2018ResourcesAvailableGuide_0.pdf), (as of 1/15/2019).
- 49 "Commissioner Policy 59 / Environmental Audit Incentive Policy," *New York State Department of Environmental Conservation*, [www.dec.ny.gov/regulations/93791.html](http://www.dec.ny.gov/regulations/93791.html), (as of 1/15/2019).
- 50 "New York Green Businesses," *NYS Department of Environmental Conservation*, [www.dec.ny.gov/chemical/939.html](http://www.dec.ny.gov/chemical/939.html), (as of 1/15/2019)
- 51 "Executive Order No. 4 (2008)," *NYS Department of Environmental Conservation*, [www.dec.ny.gov/energy/71389.html](http://www.dec.ny.gov/energy/71389.html) (as of 1/15/2019)
- 52 "GreenNY State Purchasing and Operations, NYS Office of General Services," [www.ogs.ny.gov/greenny/](http://www.ogs.ny.gov/greenny/) (as of 1/15/2019)
- 53 "Greening New York State: Sixth Progress Report on State Green Procurement and Agency Sustainability" <https://www.ogs.state.ny.us/GreenNY/Docs/2018/SixthProgressReport.pdf>
- 54 Andrew Delmonte, "Benefit Corporation guide," *SUNY Buffalo State*, [sbdcbuffalostate.edu/sites/sbdcbuffalostate.edu/files/uploads/Documents/2%20Benefit%20Corporation%20Guide.pdf](http://sbdcbuffalostate.edu/sites/sbdcbuffalostate.edu/files/uploads/Documents/2%20Benefit%20Corporation%20Guide.pdf) (as of 1/15/2019)
- 55 "Find a Benefit Corp," *Benefit Corporation* [benefitcorp.net/businesses/find-a-benefit-corp?field\\_bcorp\\_certified\\_value=&state=New%20York&title=&submit2=Go&sort\\_by=field\\_bcorp\\_state\\_value&sort\\_order=ASC&op=Go](http://benefitcorp.net/businesses/find-a-benefit-corp?field_bcorp_certified_value=&state=New%20York&title=&submit2=Go&sort_by=field_bcorp_state_value&sort_order=ASC&op=Go), (as of 1/15/2019)
- 56 "Environmental Justice," *NYS Department of Environmental Conservation*, [dec.ny.gov/public/333.html](http://dec.ny.gov/public/333.html), (as of 1/15/2019).
- 57 Erin M. Crotty, "EJ Related Policy and Regulations," *NYS Department of Environmental Conservation*, March 19, 2003, [www.dec.ny.gov/public/36929.html](http://www.dec.ny.gov/public/36929.html), (as of 1/15/2019).
- 58 "Environmental Justice," *NYS Department of Environmental Conservation*, [dec.ny.gov/public/333.html](http://dec.ny.gov/public/333.html), (as of 1/15/2019).
- 59 Thomas P. DiNapoli, "New York State's Environmental Protection Fund: A Financial History, *Office of the NYS Comptroller*, March 2018 [www.osc.state.ny.us/reports/environmental/epf-report-3-2-18.pdf](http://www.osc.state.ny.us/reports/environmental/epf-report-3-2-18.pdf), (as of 1/15/2019).
- 60 "New York State Pollution Prevention Institute," *New York State Pollution Prevention Institute*, Fall 2017, [indd.adobe.com/view/f245bf22-0010-463c-bbd2-03d19dfc909a](http://indd.adobe.com/view/f245bf22-0010-463c-bbd2-03d19dfc909a), <https://nysp21.rit.edu> (as of 1/17/2019)
- 61 *Interstate Chemical Clearinghouse*, [www.theic2.org](http://www.theic2.org), (as of 1/17/2019)
- 62 *NYS Children's Environmental Health Centers*, [nyscheck.org/](http://nyscheck.org/), (as of 1/17/2019).
- 63 "Environmental Protection Fund (EPF) FY18-19," *The Environmental Protection Fund Works*, [www.keepprotectingny.com/images/EPF\\_chart\\_3-30-18.pdf](http://www.keepprotectingny.com/images/EPF_chart_3-30-18.pdf), (as of 1/17/2019). Line items including pollution, environmental health and environmental justice funding: Open space funding for municipal and agricultural non-point source pollution (\$24,000,000 of 156,338,000), Solid waste funding except natural resource damage assessment, landfill closure, and brownfield opportunity area grants (34,474,000). Climate change and Parks funding are not included.

- 64 Frederick vom Saal, Claude Hughes, "An Extensive New Literature Concerning Low-Dose Effects of Bisphenol A Shows the Need for a New Risk Assessment," *Environmental Health Perspectives*, April 13, 2005, [www.ncbi.nlm.nih.gov/pmc/articles/PMC1280330/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1280330/), (as of 1/17/2019)
- 65 Senator Antoine M Thompson, "Senate Bill S3296H," *The NYS Senate*, March 13, 2009, [www.nysenate.gov/legislation/bills/2009/s3296/amendment/h](http://www.nysenate.gov/legislation/bills/2009/s3296/amendment/h), (as of 1/17/2019)
- 66 Assembly Member Thomas DiNapoli, "A10050," *The NYS Assembly*, March 2, 2004, [nysassembly.gov/leg/?default\\_fid=%0D%0A&leg\\_video=&bn=A10050&term=2003&Summary=Y&Actions=Y&Text=Y](http://nysassembly.gov/leg/?default_fid=%0D%0A&leg_video=&bn=A10050&term=2003&Summary=Y&Actions=Y&Text=Y), (as of 1/17/2019).
- 67 "Report of the New York State Task Force on Flame Retardant Safety," *NYS Department of Health*, March, 2013, [www.health.ny.gov/environmental/investigations/flame/docs/report.pdf](http://www.health.ny.gov/environmental/investigations/flame/docs/report.pdf), (as of 1/17/2019)
- 68 "Approved E04 Specifications: Furniture," *NYS Office of General Services*, [www.ogs.ny.gov/green/y/specs/green-specs-Furniture.asp](http://www.ogs.ny.gov/green/y/specs/green-specs-Furniture.asp), (as of 1/17/2019).
- 69 Senator Brian X Foley, "Senate Bill S4983C," *NYS Senate*, April 27, 2009, [www.nysenate.gov/legislation/bills/2009/s4983/amendment/c](http://www.nysenate.gov/legislation/bills/2009/s4983/amendment/c), (as of 1/17/2019).
- 70 Senator Thomas Libous, "Senate Bill S3788C" *NYS Senate*, Law is recorded here: May 12, 2010 [www.nysenate.gov/legislation/bills/2009/s3788/amendment/c](http://www.nysenate.gov/legislation/bills/2009/s3788/amendment/c) Map can be found here: [apps.health.ny.gov/statistics/cancer/environmental\\_facilities/mapping/map/](http://apps.health.ny.gov/statistics/cancer/environmental_facilities/mapping/map/) (as of 1/15/2019)
- 71 "NYS Hazardous Packaging Law" *NYS Department of Environmental Conservation*, [www.dec.ny.gov/chemical/56599.html](http://www.dec.ny.gov/chemical/56599.html), (as of 1/17/2019)
- 72 "6 CRR-NY 659.3 - Official Compilation of Codes, Rules, and Regulations of the State of New York," *Westlaw*, [govt.westlaw.com/nycrr/Document/14eccc21cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documentoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)&bhpcp=1](http://govt.westlaw.com/nycrr/Document/14eccc21cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documentoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhpcp=1) (as of 1/17/2019)
- 73 "6 CRR-NY 659.6 - Official Compilation of Codes, Rules, and Regulations of the State of New York," *Westlaw*, [govt.westlaw.com/nycrr/Document/14eccc624cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documentoc&transitionType=CategoryPageItem&contextData=\(sc.Default\)&bhpcp=1](http://govt.westlaw.com/nycrr/Document/14eccc624cd1711dda432a117e6e0f345?viewType=FullText&originationContext=documentoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhpcp=1) (as of 1/17/2019)
- 74 "Environmental Protection Bureau," *NYS Attorney General*, [ag.ny.gov/bureau/environmental-protection-bureau](http://ag.ny.gov/bureau/environmental-protection-bureau), (as of 1/17/2019).
- 75 "A.G. Underwood And DOI Commissioner Garnett Announce Arrest Of DEP Inspector Who Accepted Bribes From Asbestos Abatement Contractor," *NYS Attorney General*, [ag.ny.gov/press-release/ag-underwood-and-doi-commissioner-garnett-announce-arrest-dep-inspector-who-accepted](http://ag.ny.gov/press-release/ag-underwood-and-doi-commissioner-garnett-announce-arrest-dep-inspector-who-accepted), (as of 1/17/2019).
- 76 "A.G. Underwood Sues Target, Walmart, And Importer LaRose Industries Over Sales Of Lead-Contaminated Children's Toys In New York," *NYS Attorney General*, [ag.ny.gov/press-release/ag-underwood-sues-target-walmart-and-importer-larose-industries-over-sales-lead](http://ag.ny.gov/press-release/ag-underwood-sues-target-walmart-and-importer-larose-industries-over-sales-lead), (as of 1/17/2019)
- 77 "A.G. Underwood And Gov. Cuomo Announce First-Ever State Suit Against Manufacturers For Use Of Their Hazardous Firefighting Foam," *NYS Attorney General*, [ag.ny.gov/press-release/ag-underwood-and-gov-cuomo-announce-first-ever-state-suit-against-manufacturers-use](http://ag.ny.gov/press-release/ag-underwood-and-gov-cuomo-announce-first-ever-state-suit-against-manufacturers-use), (as of 1/17/2019)
- 78 "A.G. Underwood Leads Suit Against Trump Administration To Protect Farmworkers From Pesticide Poisoning," *NYS Attorney General*, [ag.ny.gov/press-release/ag-underwood-leads-suit-against-trump-administration-protect-farmworkers-pesticide](http://ag.ny.gov/press-release/ag-underwood-leads-suit-against-trump-administration-protect-farmworkers-pesticide), (as of 1/17/2019).
- 79 "A.G. Schneiderman Leads Legal Challenge Against EPA Over Toxic Pesticide," *NYS Attorney General*, [ag.ny.gov/press-release/ag-schneiderman-leads-legal-challenge-against-epa-over-toxic-pesticide](http://ag.ny.gov/press-release/ag-schneiderman-leads-legal-challenge-against-epa-over-toxic-pesticide), (as of 1/17/2019).
- 80 "Attorney General Underwood Adds Findings Of National Climate Assessment To Rulemaking Record On Rollback Of Clean Car Standards And The Clean Power Plan," *NYS Attorney General*, [ag.ny.gov/press-release/attorney-general-underwood-adds-findings-national-climate-assessment-rulemaking-record](http://ag.ny.gov/press-release/attorney-general-underwood-adds-findings-national-climate-assessment-rulemaking-record) (as of 1/17/2019)
- 81 "Citing New Federal Climate Report, Attorney General Underwood – Leading 29-Member Coalition – Calls On Trump EPA To Withdraw Plans To Gut Clean Power And Clean Air Rules," *NYS Attorney General*, [ag.ny.gov/press-release/citing-new-federal-climate-report-attorney-general-underwood-leading-29-member](http://ag.ny.gov/press-release/citing-new-federal-climate-report-attorney-general-underwood-leading-29-member), (as of 1/17/2019)
- 82 "Environmental Protection Bureau," *NYS Attorney General*, [ag.ny.gov/bureau/environmental-protection-bureau](http://ag.ny.gov/bureau/environmental-protection-bureau), (as of 1/17/2019).
- 83 *Ibid*.
- 84 *OneNYC*, [onenyc.cityofnewyork.us/](http://onenyc.cityofnewyork.us/), (as of 1/17/2019).
- 85 "New York City Administrative Code," *American Legal Publishing Corporation*, [library.amlegal.com/nxt/gateway.dll/New%20York/admin/newyorkcityadministrativecode?f=templates\\$fn=default.htm\\$3.0&vid=amlegal:newyork\\_ny](http://library.amlegal.com/nxt/gateway.dll/New%20York/admin/newyorkcityadministrativecode?f=templates$fn=default.htm$3.0&vid=amlegal:newyork_ny), (as of 1/17/2019)
- 86 Pierre-Francois Thaler, "New in Sustainability: Megatrends Driving Opportunity for Change," *Supply and Demand Change Executive*, July 11, 2018, [www.sdcexec.com/sustainability/blog/21011670/new-in-sustainability-megatrends-driving-opportunity-for-change](http://www.sdcexec.com/sustainability/blog/21011670/new-in-sustainability-megatrends-driving-opportunity-for-change), (as of 1/17/2019)
- 87 Groh Ksenia J., "database of Chemicals associated with Plastic Packaging (CPPdb), updated Oct 9, 2018" *Zenodo*. [zenodo.org/record/1287773#.XErtz1xKiM8](http://zenodo.org/record/1287773#.XErtz1xKiM8) (as of 1/24/2019)
- 88 Andrew Delmonte, "Benefit Corporation Guide," *SUNY Buffalo State*, [sbdc.buffalostate.edu/sites/sbdc.buffalostate.edu/files/uploads/Documents/2%20Benefit%20Corporation%20Guide.pdf](http://sbdc.buffalostate.edu/sites/sbdc.buffalostate.edu/files/uploads/Documents/2%20Benefit%20Corporation%20Guide.pdf), (as of 1/17/2019)
- 89 "Certification Requirements" *Certified B Corporation* [bcorporation.net/certification/meet-the-requirements](http://bcorporation.net/certification/meet-the-requirements) (as of 1/24/2019)
- 90 "B Corp Directory," *Certified B Corporation*, [bcorporation.net/directory?search=&industry=&country=United%20States&state=New%20York&city=&sort\\_by=field\\_date\\_certified&sort\\_order=ASC&page=7](http://bcorporation.net/directory?search=&industry=&country=United%20States&state=New%20York&city=&sort_by=field_date_certified&sort_order=ASC&page=7), (as of 1/17/2019).
- 91 "Carnegie is a Certified B Corp and Best For The World 2018 Honoree," *Carnegie*, [carnegiefabrics.com/about/b-corp/](http://carnegiefabrics.com/about/b-corp/), (as of 1/17/2019).
- 92 *Ecovative Design*, [www.ecovativedesign.com/](http://www.ecovativedesign.com/), (as of 1/17/2019)
- 93 *Certi PUR-US*, [certipur.us](http://certipur.us), (as of 1/17/2019).
- 94 "Alliance for Flexible Polyurethane Foam, Inc.," *Green Pages*, [greenpagesdirectory.net/directory/view/alliance-for-flexible-polyurethane-foam-inc](http://greenpagesdirectory.net/directory/view/alliance-for-flexible-polyurethane-foam-inc), (as of 1/17/2019)
- 95 "GREENGUARD Certification Program" *Underwriters Laboratory Industries*. [ul.com/environment/certificationvalidation-marks/greenguard-certification-program](http://ul.com/environment/certificationvalidation-marks/greenguard-certification-program) (as of 1/24/2019)
- 96 *The Chemical Footprint Project* [www.chemicalfootprint.org/](http://www.chemicalfootprint.org/) (as of 1/24/2019)



- 97 Tools for safer chemistry are listed on the Green Chemistry & Commerce Council's website: <https://greenchemistryandcommerce.org/resources/retailer-tools/retailer-tools/>
- 98 "Data Commons" *Healthy Building Network* <commons.healthymaterials.net> (as of 1/24/2019)
- 99 Dan Clark, "Does NY spend more to create jobs than any other state?" *Politifact*, January 5, 2018, [www.politifact.com/new-york/statements/2018/jan/05/brian-kolb/does-ny-spend-more-create-jobs-any-other-state/](http://www.politifact.com/new-york/statements/2018/jan/05/brian-kolb/does-ny-spend-more-create-jobs-any-other-state/), (as of 1/17/2019)
- 100 Investor Environmental Health Network [www.ienh.org](http://www.ienh.org) (as of 1/24/2019)
- 101 "Greenpeace report: clothing industry shows progress in cutting hazardous chemicals" *Greenpeace* July 12, 2018 [www.greenpeace.org/international/press-release/17739/greenpeace-report-clothing-industry-shows-progress-in-cutting-hazardous-chemicals/](http://www.greenpeace.org/international/press-release/17739/greenpeace-report-clothing-industry-shows-progress-in-cutting-hazardous-chemicals/) (as of 1/24/2019)
- 102 "Mind the Store," *Safer Chemicals, Healthy Family*, [saferchemicals.org/mind-the-store/saferchemicals.org/mind-the-store/](http://saferchemicals.org/mind-the-store/saferchemicals.org/mind-the-store/), (as of 1/17/2019)
- 103 "Who's Minding the Store?" *Mind the Store*, [retailerreportcard.com/](http://retailerreportcard.com/) (as of 1/22/2019)
- 104 Campaign for Healthier Solutions [ej4all.org/campaigns-and-activities/campaign-for-healthier-solutions/](http://ej4all.org/campaigns-and-activities/campaign-for-healthier-solutions/) (1/24/2019)
- 105 Getting Ready for Baby Campaign [www.gettingready4baby.org](http://www.gettingready4baby.org) (as of 1/24/2019)
- 106 New York Sustainable Business Council [www.nyssbc.org](http://www.nyssbc.org) (as of 1/24/2019)
- 107 American Sustainable Business Council <https://www.asbc.org/> (as of 1/24/2019)
- 108 Green Business Partnership [www.greenbusinesspartnership.org/](http://www.greenbusinesspartnership.org/) (as of 1/24/2019)
- 109 Western New York Sustainable Business Roundtable [www.wnysustainablebusiness.org/](http://www.wnysustainablebusiness.org/) (as of 1/24/2019)
- 110 "Goliano Institute for Sustainability: About" *Rochester Institute of Technology* [www.rit.edu/gis/about/about](http://www.rit.edu/gis/about/about) (as of 1/24/2019)
- 111 "New York State Pollution Prevention Institute" *Rochester Institute of Technology* [nysp2i.rit.edu](http://nysp2i.rit.edu) (as of 1/24/2019)
- 112 Clarkson University [www.clarkson.edu/](http://www.clarkson.edu/) (as of 1/24/2019)
- 113 "NYS P2I Research & Development" *Rochester Institute of Technology* [www.rit.edu/affiliate/nysp2i/research-development](http://www.rit.edu/affiliate/nysp2i/research-development) (as of 1/24/2019)
- 114 Columbia Center for Children's Environmental Health of the Mailman School of Public Health at Columbia University <https://ccceh.org> (as of 1/24/2019)
- 115 Cornell University [www.cornell.edu/](http://www.cornell.edu/) (as of 1/24/2019)
- 116 "Department of Environmental Medicine and Public Health" *Icahn School of Medicine at Mount Sinia* [icahn.mssm.edu/about/departments/environmental-public-health](http://icahn.mssm.edu/about/departments/environmental-public-health) (as of 1/24/2019)
- 117 "Sustainable Environmental Systems" *Pratt University* <https://www.pratt.edu/academics/architecture/sustainable-environmental-systems/> (as of 1/24/2019)
- 118 "Center for Clean Water Technology: Drinking Water Contaminants" *Stony Brook University* [www.stonybrook.edu/](http://www.stonybrook.edu/) [commcms/cleanwater/research/drinkingwater.php](http://commcms/cleanwater/research/drinkingwater.php) (as of 1/24/2019)
- 119 "Institute for Health and the Environment" *University at Albany* <https://www.albany.edu/ihe/> (as of 1/24/2019)
- 120 Collaboratory for a Regenerative Economy [www.corebuffalo.org/](http://www.corebuffalo.org/) (as of 1/24/2019)
- 121 "Proposition 65" California Office of the Environmental Health Hazard Assessment, of the CA Environmental Protection Agency. <https://oehha.ca.gov/proposition-65> (as of 1/24/2019)
- 122 "General Laws Part 1, Title II, Chapter 21: Massachusetts Toxics Use Reduction Act Section 2: Definitions" *Commonwealth of Massachusetts* [malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter21/Section2](http://malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter21/Section2) (as of 1/24/2019)
- 123 "Hazardous Waste and Toxics Reduction" *Washington State Department of Ecology* <https://ecology.wa.gov/About-us/Get-to-know-us/Our-Programs/Hazardous-Waste-Toxics-Reduction> (as of 1/24/2019)
- 124 <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> (as of 1/24/2019)
- 125 <https://www.un.org/sustainabledevelopment/health/> (as of 1/24/2019)
- 126 <https://www.un.org/sustainabledevelopment/water-and-sanitation/> (as of 1/24/2019)
- 127 <https://www.un.org/sustainabledevelopment/infrastructure-industrialization/> (as of 1/24/2019)
- 128 <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/> (as of 1/24/2019)
- 129 [http://ec.europa.eu/environment/chemicals/reach/reach\\_en.htm](http://ec.europa.eu/environment/chemicals/reach/reach_en.htm) (as of 1/24/2019)
- 130 <https://chemsec.org/the-usual-suspects-time-to-move-beyond-the-most-obvious-svhcs/> (as of 1/24/2019)
- 131 <http://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/> (as of 1/24/2019)
- 132 <http://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/set-up-global-reverse-networks/> (as of 1/24/2019)
- 133 <https://www.weforum.org/about/circular-economy-videos> (as of 1/24/2019)
- 134 "A Roadmap for Advancing Green Chemistry in Washington State 2012-2017" from Washington State Departments of Commerce and Ecology. May 2013. Page 5. [fortress.wa.gov/ecy/publications/documents/1204009.pdf](http://fortress.wa.gov/ecy/publications/documents/1204009.pdf) (as of 1/24/2019)
- 135 <http://engineering.buffalo.edu/materials-design-innovation.html>
- 136 "A Roadmap for Advancing Green Chemistry in Washington State 2012-2017" from Washington State Departments of Commerce and Ecology. May 2013. Page 9. [fortress.wa.gov/ecy/publications/documents/1204009.pdf](http://fortress.wa.gov/ecy/publications/documents/1204009.pdf) (as of 1/24/2019)
- 137 <https://esd.ny.gov/centers-advanced-technology>
- 138 "Bill Tracker" *Safer States* [www.saferstates.org/bill-tracker](http://www.saferstates.org/bill-tracker) - click on the link for "Adopted Policy". (as of 1/15/2019)