LABOR NETWORK FOR SUSTAINABILITY

FIXING BAD CHEMISTRY:
WORKERS, JOBS, TOXICS AND THE FUTURE OF THE CHEMICAL INDUSTRY

A DISCUSSION PAPER FOR CHEMICAL INDUSTRY WORKERS AND ALLIES

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INTRODUCTION

Americans need a good chemical industry. We need a chemical industry that provides safe, well-paid, secure jobs for its workers. That protects the health

and safety of the workers and communities it affects. That provides the rest of us safe materials that minimize destructive impacts both in production and in use. And that contributes effectively to the transition to a sustainable, climate-safe world. Such an industry could provide hundreds of thousands of good jobs promoting the well-being of our planet and its people.

Unfortunately, that is not the chemical industry we've got. In the past twenty years, the American chemical industry has cut nearly 40% of its jobs; if current trends continue it will cut half of its remaining US jobs by 2030.[1] The industry exposes workers, consumers, and communities to tens of thousands of chemicals whose safety is unproven and whose characteristics it keeps secret. It has little accountability for its impacts on local and global environments – and it uses its vast resources to fight such accountability. And it is doing little to implement a new "green chemistry" that can help convert the world to a sustainable basis. You could call it bad chemistry.

Fixing Bad Chemistry: Jobs, Workers, Toxics and the Future of the Chemical Industry is a guide to moving from the bad chemical industry we have to the good chemical industry we need. It tells how to protect the lives and livelihoods of workers in the chemical industry while also protecting the environment. It is designed first and foremost for those on the front line, chemical workers themselves, and more broadly for their potential allies concerned with protecting local communities and the broader environment. It is also intended for anyone concerned about our transition to a society that is economically, socially, and environmentally sustainable and just.

The Discussion Paper

Chapter 1 of this discussion paper describes the past, present, and possible futures of the American chemical industry in its global setting. It examines the reasons why the industry produces bad chemistry instead of good chemistry. Those reasons include a focus on short-term profits and a disregard of all the stakeholders who are affected by the industry, whether they be local communities, workers in the industry, those who use and are exposed to chemicals "downstream," or the broader public who face the consequences of industry malfeasance and nonfeasance.

Chapter 2 looks at the consequences of bad chemistry. It is causing the continuing downsizing, outsourcing, speed-up, and de-skilling of chemical industry jobs. It exposes workers, consumers, and communities to dangerous chemicals. And it fails to create new jobs making the kind of chemicals we need

[1] James Heintz and Robert Pollin, *The Economic Benefits of a Green Chemical Industry in the United States: Renewing Manufacturing Jobs While Protecting Health and the Environment* (Amherst, MA: Political Economy Research Institute, University of Massachusetts, 2012), p. 3. The figures do not include pharmaceuticals.

to support the conversion to a sustainable, climate-safe world.

Chapter 3 examines ways of fixing bad chemistry. State and Federal governments can help reconstruct the industry using some of the same techniques that helped stabilize jobs in the auto industry while moving it to a greener basis. New chemical regulation can replace today's antiquated, toothless Toxic Substances Control Act (TSCA) with the kind of regulation that has already been established in much of the rest of the world. Meanwhile, chemical workers are already developing ways to establish safer, greener chemical practices in their own workplaces.

All of these strategies require a central role for workers and their unions. At the same time, they require an alliance of labor with others in local communities and the broader public. And those stakeholders must be empowered to hold the chemical companies accountable to society's need to replace bad chemistry with good chemistry.

Sometimes that alliance is made difficult by the idea that there is a conflict between protecting workers and protecting the environment. But today that is a false choice. Redefining the chemical industry as a means to protect the environment is the key to creating both more jobs and safer jobs for chemical workers.

Bad chemistry is part of a broader assault on both workers and the environment by those who would have a world shaped by nothing except corporate greed. The analysis and strategy laid out in this discussion paper for the chemical industry is part of a broader labor strategy for a planned transition to a sustainable society -- for solving our economic problems by solving our sustainability problems.

The author would like to thank Rick Engler of the New Jersey Work Environment Council, Charlotte Brody of the Blue-Green Alliance, and Anna Fendley and Michael Wright of the United Steelworkers Union for help in the preparation of this paper. LNS also thanks the New Voices in Chemical Policy initiative of the Eco Fund at the Tides Foundation for financial support.

The Labor Network for Sustainability is a national network of more than 6000 trade unionists, environmentalists, students and others dedicated to addressing issues ranging from climate change and green job creation to economic justice and renewable energy.

THE PROBLEM: BAD CHEMISTRY

How We Got the Chemical Industry We Have

Our world –plants, animals, and people included – is made up of chemicals. So are the foods we eat, the air we breathe, and the environment we live in.

From earliest times, people gradually learned to take materials in the form nature provided them and transform them to take advantage of their hidden chemical properties. They gathered and prepared herbs for healing; used tannin from trees to tan leather; and melted ore to produce metal. But these processes were discovered largely by chance and were not organized as a systematic body of knowledge.

The modern chemical industry emerged as a result of the development of the science of chemistry, which made it possible to invent ever new ways to break down materials, transform them, and synthesize new materials from them.[2] In Germany starting in the 1880s university-based scientists formed research teams that aligned with and received long-term support from large, multiproduct companies. By the 1920s similar alignments had emerged in Switzerland, the UK, and the US.[3] The new chemical industry transformed agriculture, industry, and everyday life. The related pharmaceutical industry transformed medicine. Whatever the products, whether the food on our tables, the houses we live in, or the cars we drive, the chemical industry has played a major role in creating them.

In the United States the chemical industry was pioneered by DuPont and Monsanto. Mergers added Dow, Union Carbide, Allied, and other multisector producers, along with about fifty chemical companies and thirty pharmaceutical companies focused on particular product niches.[4] During the 1920s, US chemical companies established their own research and development programs, complementing those of universities and government. They increasingly challenged European companies for technological and economic leadership.[5] By 1946, chemical companies employed nearly a third of all scientists and engineers in US industrial research labs.[6]

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[2] Alfred D. Chandler, Jr., *Shaping the Industrial Century* (Cambridge, MA: Harvard University Press, 2005) p. 4.
[3] ACS, *Innovation, Chemistry, and Jobs*, Appendix II – A Brief History of U.S. Innovation in Chemistry, p. 1 http://web.2.c2.audiovideoweb.com/va92web25028/InnovationChemistryJobsReport-PDFs/Appendix%20II.pdf Chandler provides a somewhat different periodization. See p. 4.
[4] Chandler, p. 4.
[5] Chandler, p. 5.
[6] ACS, Appendix II, Table II-1, p. 2.

The early American chemical industry drew its raw materials from non-carbon "inorganic" sources, but in the 20th century fossil fuels like coal, natural gas, and especially petroleum became increasingly important "organic" raw materials. As a result, several oil companies became important chemical producers.

The years during and after World War II saw both the economy and daily life transformed by new chemical products, including plastics, synthetic fibers, fiberglass, silicones, herbicides, epoxides, flame retardants, high-nitrogen fertilizers, and automotive catalytic converters. From 1950 to 1974, chemical production grew approximately twice as fast as the American economy as a whole.[7]

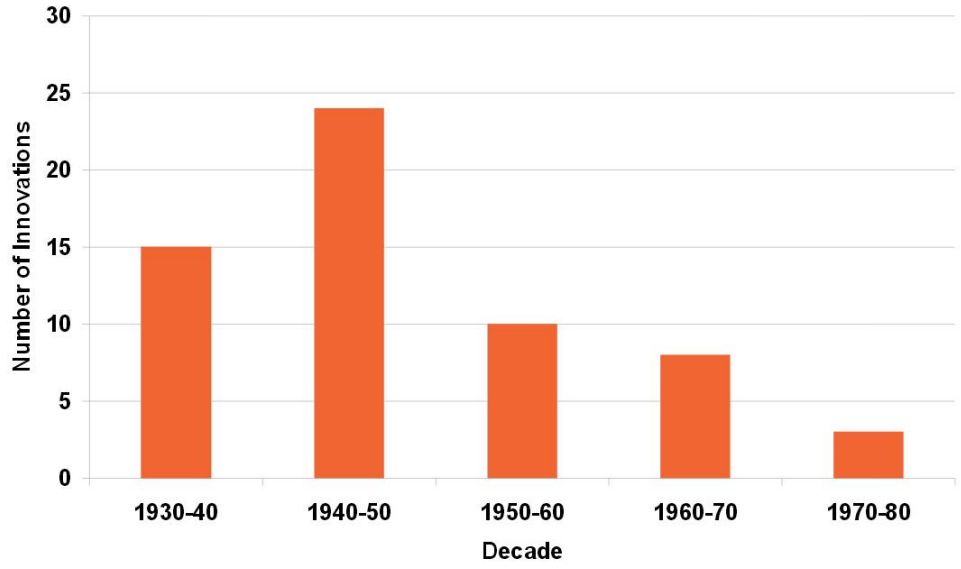
The US chemical industry changed radically after the economic crisis of 1973. According to Carol Williams, executive vice president of Dow Manufacturing and Engineering, "America went from being a net exporter of chemicals to a net importer. And for about 10 years there was almost no investment in the industry."[8]

Despite the chemical industry's reputation for dynamism, growth and innovation declined.[9] According to a study by the American Chemical Society,

With a lack of innovation, chemical companies entered a competition to produce the same materials less expensively than their competitors. Capacity grew to levels exceeding consumer demands, products were commoditized, and global competition with companies in countries with cheaper feed stocks took their tolls on U.S. chemical industry profits. Philosophical changes began to take place in the way that chemical companies were run, and a higher emphasis was placed on producing products that customers knew and wanted rather than finding markets for new or existing products.[10]

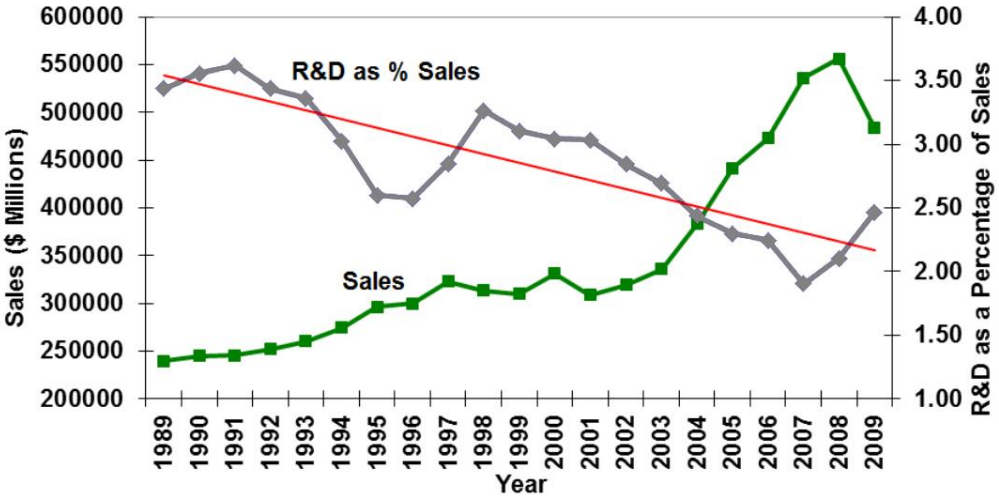
[7] ACS, Appendix II, p. 2.
[8] Jonathan Katz, "Dow Chemical's Recipe for Competitiveness and Innovation," *IndustryWeek*, March 11, 2012.
[9] ACS, Appendix II, p. 3.
[10] ACS, Appendix 2, p. 4

Figure II-1. Number of Innovations per Decade, 1930-1980



After 1974, chemical companies began cutting back on research. During the 1990s chemical industry R & D spending dropped from 4% to 2.5% of sales and reductions continued through the 2000s.[11] Today R & D spending by the US chemical industry is 1.5% of sales, less than half the average for US manufacturing.[12] A Brookings Institution study concluded that the slowdown in innovation in the American chemistry industry occurred not because of a lack of invention or creativity, but because "the U.S. economy failed to incorporate new technology effectively into production."[13]

Figure II-3. R&D Costs as a Percentage of Sales for Chemicals (excluding Pharmaceuticals), 1989-2009



[11] ACS, Appendix 2, p. 5.
[12] Heintz and Pollin, p. 3. See also p. 24 and tables on p 25.
[13] Quoted in ACS, Appendix 2, p. 5.

Chemical Industry Unions

Unions in the American chemical industry date at least to 1836, when Philadelphia chemical workers were members of a union of Soap Boilers and Tallow Chandlers.[14] By 1902, the American Federation of Labor had chartered the Explosive Powder Workers union with 400 members. In 1910 the AFL organized workers in asbestos plants, soap factories, and gas works into the Asbestos Workers Union. In the 1930s, the AFL, the CIO, and the United Mine Workers all organized chemical workers. According to one account,

> As a result of this three-way division of organization, unionism in the industry has never exerted the influence that is possible in other industries where a single union predominates. Frequently, in the chemical industry, different plants of a multi-plant company are not organized by the same union. . . . Company-wide negotiations in the chemical industry have been the exception rather than the rule.[15]

Worker organization expanded along with the growth of the chemical industry and the rise of industrial unionism before, during, and after World War II. Some of the unions derived from the UMW and the CIO joined the Steelworkers Union; others became part of the Oil, Chemical, and Atomic Workers which later merged with the Steelworkers Union. They include workers in industrial gases and inorganic chemicals; pharmaceutical preparations; paints; industrial organic chemicals and fertilizers; explosives; soap; petrochemicals; petroleum refining; asphalt refining; asphalt paving mixtures, felts and coatings; lubricating oils and greases; and oil pipelines.[16] Those unions derived from the AFL are today in the International Chemical Workers Union, part of the United Food and Commercial Workers. Other chemical workers are in the Teamsters, IUE-CWA, and other unions. Over time, many of these unions cooperated through the coordinated bargaining department and health and safety program of the AFL-CIO's Industrial Union Department. Today chemical industry unions continue to cooperate: For example, the health and safety departments of the Steelworkers, UFCW, and Change to Win federation joined together to challenge the policies of the U.S. Chemical Safety Board.[17]

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[14] John R. Commons et al, *History of Labour in the United States* (New York: MacMillan, 1921), p. 476.

[15] History of the ICWUC http://www.icwuc.org/history.html . A similar picture emerges from Arnold R. Weber, "Competitive Unionism in the Chemical Industry," *Industrial and Labor Relations Review*, Vol. 13, No 1 (Oct., 1959)

[16] USW, "What We Make," http://www.usw.org/our_union/who_we_are?id=0003

[17] United Steelworkers, "Unions Say Chemical Safety Board is Broken, Putting Workers and Communities at Risk," *USW News,* October 5, 2009. http://www.usw.org/media_center/releases_advisories?id=0228

The Chemical Industry Today

Eight hundred thousand people work making chemicals in the US. More than four million jobs are linked to the chemical industry.

Overall U.S. Employment in Chemistry

THOUSANDS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Annual Change 2008 - 09	Annual Change 1999 - 09
Manufacturing	17,322	17,263	16,441	15,259	14,510	14,315	14,226	14,155	13,879	13,406	11,883	-11.4%	-3.4%
Chemicals	983	980	959	928	906	887	872	866	861	847	803	-5.2	-1.8
Basic chemicals	195	188	181	170	162	156	150	147	149	152	145	-4.6	-2.7
Resins, synthetic rubber & fibers	137	136	126	115	112	110	108	105	106	105	93	-11.4	-3.5
Agricultural chemicals	51	48	46	45	42	42	40	38	36	37	37	0.0	-2.9
Pharmaceuticals	261	274	283	291	292	290	288	292	295	291	285	-2.1	0.8
Paints, coatings & adhesives	78	80	75	72	69	68	68	67	65	62	58	-6.5	-2.7
Soaps & toiletries	131	130	127	121	119	115	114	111	110	107	102	-4.7	-2.2
Other chemicals	128	127	120	114	111	107	104	105	101	95	85	-10.5	-3.7

NOTE: Average annual domestic employment

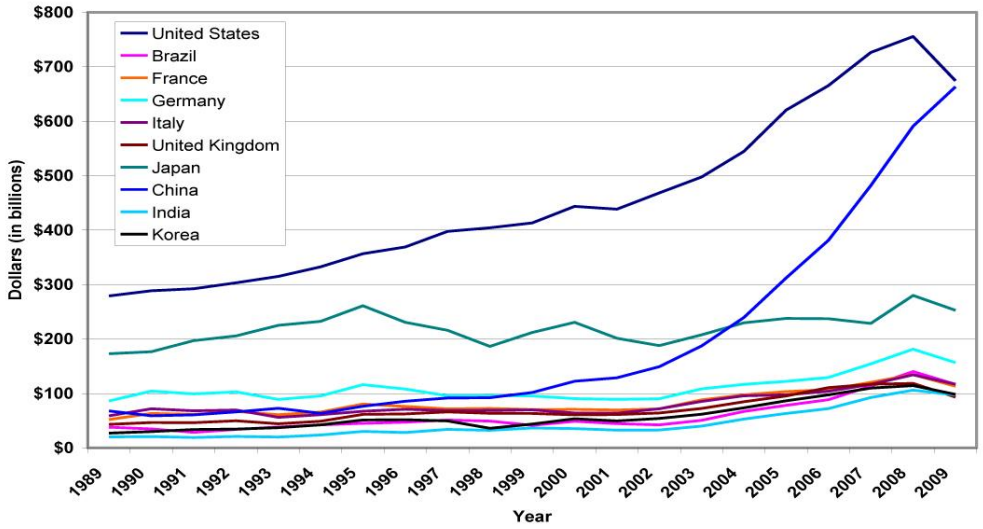
Sources: Voith, M.; McCoy, M.; Reisch, M. S.; Tullo, A.H.; Tremblay, J. Facts & Figures of the Chemical Industry. Chem. Eng. News. 2010, 88, 33-67.
National Occupational Employment and Wage Estimates United States, 1982009; Technical Report for the U.S. Department of Labor, Bureau of Labor Statistics: Washington, DC, 2009.

Eighty thousand different chemicals are produced in the US. Each year the US chemical industry produces 27 trillion pounds of chemicals. That's 86,000 pounds per American. According to the leading trade industry organization, the American Chemistry Council, 96% of US manufactured goods use some product from the chemical industry.[18] The chemical and closely related plastics industries make up 17 percent of US manufacturing's contribution to GDP, producing $674 billion in output and directly contributing $273 billion to the US economy.

The chemical industry is globally integrated. The US is still the world's largest producer of chemical products, making 20% of the world's chemicals by value. China is a close second. Global non-pharmaceutical chemical industry production is projected to increase 4.5% annually for the next decade[19] and to triple by 2050. However, the US share of the global market is declining.[20]

[18] Heintz and Pollin, p. 8-10
[19] Heintz and Pollin, p. 3.
[20] Heintz and Pollin, p. 11.

Global Chemical Sales by Country



Source: 2010 Guide to the Business of Chemistry American Chemistry Council: Ro sslyn, VA, 2010.

The US is both an exporter and an importer of chemicals. Exports rose as a share of US output from 12% in 1989 to 22% in 2009.[21] But the US imported $146 billion in 2009 – almost the same as it exports.

US chemical companies employed 847,000 people in the US in 2008 and nearly as many -- 627,000 -- in foreign affiliates abroad. About half of the off-shore jobs are in Europe.[22] At the same time, there were 306,000 people employed by foreign companies producing in the US, 321,300 fewer than in US companies abroad.

Historian Alfred Chandler has pointed out the extraordinary long-run stability of the leading chemical companies. By the 1920s, fifty leading chemical companies had established themselves in the US. Remarkably, by the 1990s, only two companies had replaced those already in the magic circle seventy years earlier –otherwise the fifty leading companies were the same.[23] According to Chandler, the reason is that the industry maintained unusually high barriers to entry by new companies.

[21] Heintz and Pollin, p. 10-10
[22] Heintz and Pollin, p. 11. (See chart p. 12 for more detail)
[23] Chandler, p. vii, 9.

TOP 50 U.S. CHEMICAL FIRMS

2011	Company	Chemical Sales ($Millions)	2011	Company	Chemical Sales ($Millions)
1	Dow Chemical	$59,985	26	Cytec Industries	$3,073
2	ExxonMobil	$41,942	27	Rockwood Specialities	$3,053
3	Dupont	$34,763	28	Chemtura	$3,025
4	Chevron Phillips	$13,935	29	Albermarle	$2,869
5	PPG Industries	$13,824	30	TPC Group	$2,759
6	Praxair	$11,252	31	Georgia Gulf	$2,575
7	Huntsman Corp.	$11,252	32	Ferro Corp.	$2,156
8	Mosaic	$9,938	33	NewMarket	$2,138
9	Air Products	$9,938	34	Solutia	$2,097
10	Momentive	$7,844	35	Kronos Worldwide	$1,943
11	Eastman Chemical	$7,178	36	Stepan	$1,843
12	Celanese	$6,763	37	Tronox	$1,651
13	Dow Corning	$6,427	38	Goodyear	$1,594
14	Lubrizol	$6,100	39	H.B. Fuller	$1,558
15	CF Industries	$6,098	40	Sigma-Aldrich	$1,503
16	Styron	$6,000	41	Kraton Polymers	$1,438
17	Honeywell	$5,659	42	Olin	$1,389
18	Occidental Petroleum	$4,815	43	Reichhold	$1,183
19	Ecolab	$4,649	44	OM Group	$1,111
20	Ashland	$4,531	45	Sunoco	$1,095
21	Westlake Chemical	$3,620	46	Koppers	$1,016
22	FMC Corp.	$3,378	47	Omnova	$952
23	Monsanto	$3,240	48	Innophos	$811
24	W.R. Grace	$3,212	49	MedWestvaco	$811
25	Cabot Corp.	$3,102	50	Innospec	$774

Source: Tullo [24]

A few of these companies, notably DuPont and Dow, were multisector companies producing a wide range of different products in diverse categories. The remainder were specialty chemical manufacturers focused primarily on products that had been commercialized before 1960.[25]

From the 1920s through the 1960s, this industry structure encouraged rapid technological innovation and an explosion of new products. But since the 1970s it has had the reverse effect. The chemical companies, despite their image as innovators, have slashed their research staffs, slowed the introduction

[24] Alexander H. Tullo, "Top 50 U.S. Chemical Producers," *C&EN*, May 14, 2012, p. 25.
[25] Chandler, p. 31.

of new products, and concentrated on "commodity" chemicals as a strategy for lowering costs. They have been more concerned to protect their "sunk capital" than to invest in what society needs. They have taken advantage of the "barriers to entry" to keep a comfortable, profitable niche for themselves while doing less and less to meet society's needs for safe chemicals that can facilitate the transition to a sustainable economy. When they face international competition, they often turn to outsourcing and offshoring to keep their prices competitive.

Segments of the Chemistry Industry

Pharmaceuticals include prescription and over-the-counter drugs; in-vitro and other diagnostic substances, vaccines; serums, plasmas and other biological products; and vitamins and other pharmaceutical preparations for both human and veterinary use.

Basic chemicals include inorganic chemicals, bulk petrochemicals, organic chemical intermediates, plastic resins, synthetic rubber, man-made fibers, dyes and pigments, printing inks, etc. Also called commodity chemicals, these chemicals are produced in large volumes.

Specialty chemicals are low-volume, high-value compounds sold on the basis of their function. Also known as performance chemicals, some examples include paint, adhesives, electronic chemicals, water management chemicals, oilfield chemicals, flavors & fragrances, rubber processing additives, paper additives, industrial cleaners, and fine chemicals.

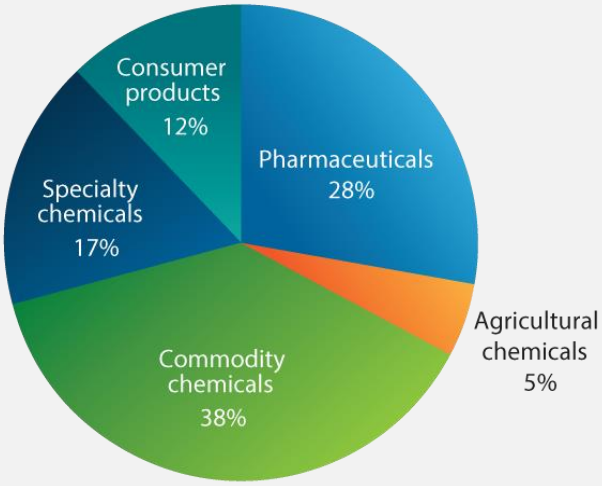
Agricultural chemicals include fertilizers and crop protection chemicals, i.e., pesticides.

Consumer products include soap, detergents, bleaches, laundry aids, toothpaste and other oral hygiene products, shampoos and other hair care products, skin care products, cosmetics, deodorants and other body care products, and perfume and cologne, among others.

Source: American Chemistry Council[26]

[26] http://www.americanchemistry.com/Jobs/EconomicStatistics/Industry-Profile/Business-of-Chemistry-Segments see also Heintz and Pollin, 12-13, including figure 6 chart from ACC. The boundaries of the chemical industry and its segments can be fuzzy to say the least. Segments like plastics and pharmaceuticals are sometimes included, sometimes excluded. Throughout this manual we will indicate in the footnotes what particular statistics include or exclude.

Major Segments of the Chemical Industry, Shares of Total Output, 2009



Source: American Chemistry Council. 2010 Guide to the Business of Chemistry.

http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/green_economics/Green_Chemistry_Report_FINAL.pdf [27]

While almost all states have at least some chemical industry jobs, the largest concentration is in Texas, followed by Ohio, California, Illinois, New Jersey, New York, Tennessee, Louisiana, Pennsylvania, and North Carolina.[28]

The Politics of Bad Chemistry

The chemical companies have not just followed their own industrial strategies. They have tried to prevent public policies that would encourage or require them to function in the public interest. Acting on their own and through industry associations, they have spent millions of dollars to influence public opinion in their favor. They have spent additional millions to win favorable policies from politicians and elected officials. They have fought against efforts to regulate the industry. The result has been to leave the American public largely unprotected from chemical hazards and without the safe and sustainability-promoting chemicals we need.

[27] Heintz and Pollin, figure 6, p. 15.
[28] Based on Heintz and Pollin, figure 3, p. 12.

"Responsible Care"

This reality has been concealed by a deliberate effort at "greenwashing" and "cleanwashing." According to secret documents released in a lawsuit, in 1987 the Public Perception Committee of the board of the industry trade organization the Chemical Manufacturers Association expressed concern that public opinion of the industry had reached "an all-time low."[29] An internal poll commissioned by the Chemical Manufacturers Association in 1990 found that "by comparison with 10 other industries, the chemical industry was rated ahead of only the tobacco industry by the general public."

This should have come as no surprise. Chemical disasters in the US and worldwide had been headline news for years. There had been thousands of chemical industry accidents; toxic disasters like Love Canal had become household words. Release of toxic substances at the Union Carbide plant in Bhopal, India three years earlier killed somewhere between 5,800 and more than 20,000 people. The public was clamoring for public policy to protect it against chemical threats.

In response, in 1988 the Association launched what it called the "Responsible Care" campaign. A 1990 internal document explained that a primary goal of the campaign was to slow the "public desire for additional regulation." The Chair of the Association explained to *Chemical Week* that the way to reverse pubic distrust was through "better, more open communication outlined by Responsible Care." This will let people feel less helpless about chemical risks, which is what "drives people to support stronger regulations and legislation." Without a feeling of control over their lives, people "seen no choice but for government to have more control over us."

Political scientist Michael Givel of the University of Oklahoma, who studied the nearly one hundred thousand secret chemical industry documents released by court order, concludes, "The primary goal of the Responsible Care effort has been to change public concerns and opinion about chemical industry environmental and public health practices while also opposing support for stronger and more expensive public health and environmental legislation and regulation of chemical products, even if warranted."

In 2000, perhaps as part of its public relations strategy, the Chemical Manufacturers Association changed its name to the innocuous-sounding American Chemistry Council.[30]

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[29] Michael Givel, "Motivation of chemical industry social responsibility through Responsible Care," *Health Policy*, April 2007. All subsequent quotes in this section are from this article.
[30] http://gadfly.igc.org/progressive/corp-reg.htm

Bad Chemistry

The chemical companies have systematically opposed all forms of social responsibility, accountability, and regulation in the public interest. They have also maintained a high level of secrecy about their processes and products. As a result, they are subject to extremely limited public control. For instance, they have repeatedly and successfully gone to court to prevent the EPA from regulating such an extremely hazardous substance as asbestos. They claim to engage in "self-regulation," but their Responsible Care program is more part of their campaign against regulation than a serious effort to protect the public from chemical hazards.

We need a chemical industry that provides jobs and protects the health and wellbeing of workers and communities. We need a chemical industry that serves the long-term conversion of the US and global economies to a safe, sustainable basis. We need a chemistry industry that is producing what people and society need, rather than one shaped by the short-term profitability of the chemical companies.

Unfortunately, that's not the chemical industry we've got.

The Industry in Politics: Protecting Bad Chemistry

"Unlike other manufacturing industries, chemical companies do not tend to contribute more to the party in power, but have solidly backed Republicans for most of the past two decades. The chemical companies are in a near constant state of conflict with environmentalists and consumer advocates -- a key constituency of Democrats -- and thus the industry has calculated that it is better to support the GOP. Over the past two decades, Republicans have received nearly three-quarters of the $72 million contributed by the industry."

"The chemical industry spent almost $45.3 million on federal lobbying in 2009, down from a 2008 high of $50 million. The top spender -- the American Chemistry Council, a trade group -- recorded more than $7 million in lobbying expenditures during 2009, nearly three times the amount it spent just two years before in 2007. Chemical giants Dow and DuPont also spent heavily on lobbying in 2009, with $6 million and $3.75 million respectively in lobbying expenditures."

"The biggest issues facing the industry are environmental, health and safety regulations, both related to the manufacturing process and to the products themselves. Under a Democratic Congress and the Obama administration, the industry fears more stringent regulations or outright bans on certain products and chemicals."

-- Steve Spires, Center for Responsive Politics[31]

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The Chemicals Industry in the 2012 Elections

"Since the introduction of the first bills to reform TSCA [Toxic Substances Control Act], most of America's chemical companies have used their trade association, the ACC, as their public face. At first the ACC opposed any changes in chemical regulation. During an early hearing on the 2005 version of a bill, an ACC representative told Senators:

The statute itself has proven effective and remarkably adaptable to changing needs and priorities. TSCA works, and it works well, and the facts support that conclusion.

But it became impossible to defend the credibility of that statement as more than 18 states passed chemical-related laws, explicitly citing the lack of meaningful federal protections. Similarly, companies like Walmart and Staples began to implement their own chemical policies to weed out some of the worst chemicals from their supply chains, citing a collapse in consumer confidence in the federal system. So the ACC publicly changed course in 2009 and endorsed reform of TSCA, even proposing their own principles for reform.

But as pressure has mounted for action on the Safe Chemicals Act, industry has maintained a public face of cooperation while working diligently behind the scenes to stall and defeat reform. In 2012, although Sen. Frank Lautenberg (D-NJ) reworked legislation to strengthen TSCA to reflect months of input from chemical companies, the ACC worked hard to prevent Republicans from joining him in a compromise, even mounting an extraordinary campaign to punish some of their own members for participating in such efforts. Nevertheless, in their statement at the time of the vote, ACC expressed its commitment to reform:

"ACC and our members are committed to working with the Senate Committee on Environment & Public Works to pursue reform of the Toxic Substances Control Act (TSCA), and have demonstrated our commitment time and again."

In July 2012, legislation passed the committee in spite of this campaign, though without Republican support. Industry contributions in the current election cycle have gone predominantly to Republicans, who have received 78% of the total, compared to just 22% for Democrats."

-- *Toxic Spending: The Political Expenditures of the Chemical Industry, 2005-2012*
Common Cause[32]

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http://www.opensecrets.org/industries/background.php?cycle=2012&ind=N13

[32] *Toxic Spending: The Political Expenditures of the Chemical Industry, 2005-2012* Common Cause http://www.commoncause.org/atf/cf/%7BFB3C17E2-CDD1-4DF6-92BE-BD4429893665%7D/COMMONCAUSE_TOXICSPENDING-10%2023%20FINAL.PDF

THE CONSEQUENCES OF BAD CHEMISTRY

The strategies adopted by the American chemical industry have led to massive job loss in the United States. They have led to the poisoning of workers, communities, and environments. They have left unfilled our society's need for chemicals that are safer and that can support the transition to a sustainable economy. And they have prevented effective regulation and direction of the industry in the public interest.

Job Killing

Between 1992 and 2010, the US chemical industry (excluding pharmaceuticals) reduced employment by 38 percent, cutting more than 300,000 jobs. If that pattern is not changed, the chemical industry is set to eliminate 230,000 jobs by 2030 -- half of the jobs remaining in the industry.[33]

This job reduction is not the result of declining production. During this 1992-2010 period, the value of chemical industry production increased 4% a year.[34] From 2000 to 2009 the growth rate for US output has been 50%. (The global growth rate for this same period has been 98%.)[35] The job loss is due primarily to two strategies adopted by the US chemical industry: labor cost reduction and off-shoring.

Rather than investing in research and new production facilities, the chemical industry strategy has been to reduce labor costs. This has involved plant closing, downsizing, outsourcing, concession bargaining, cutting corners on safe production, and the phasing out of more complex forms of production in favor of high-output "commodity" chemicals.

The exception has been the pharmaceutical segment of the US industry. Non-pharmaceutical chemical production went from 807,000 jobs in 1992 to 504,000 jobs in 2010, a 38% reduction. In the same period pharmaceuticals went from 220,000 jobs to 273,000, a 24% increase.[36] The primary reason is that the pharmaceutical segment of the industry did not follow these job-cutting strategies. In non-pharmaceutical chemicals in this period every 1% increase in output was accompanied by a 1% decrease in jobs. In pharmaceutical chemicals in the same period every1% increase in output was accompanied by a .6 percent gain in jobs.[37] This is largely because at least until recently the pharmaceutical companies have invested in creating new products rather than cutting labor costs. Whether this trend is now being reversed is not yet clear.

The same patterns can be seen in the ratio of jobs to sales. In 1989, a million

[33] Heintz and Pollin, p. 3.
[34] Heintz and Pollin, p. 3.
[35] Heintz and Pollin, p. 11.
[36] Heintz and Pollin, p. 8-9.
[37] Heintz and Pollin, p. 9.

dollars of sales in non-pharmaceutical chemicals produced 1.83 jobs. In 2009 the same value in sales produced only one job – a 40% decline. In pharmaceuticals the decline was much less, from 1.62 to 1.49 jobs per $1 million in sales.[38]

The other job-killing strategy of the chemical industry has been to move its jobs off-shore. While the chemical industry has always been international, in the era of globalization US companies have transferred large numbers of jobs abroad. In 2008, there were an estimated 627,000 jobs in foreign affiliates of US companies that were majority owned by their US parent company. That's about three-quarters of the 847,000 jobs in the US.[39]

If recent productivity and global market share trends continue, 230,000 additional jobs will be lost from the non-pharmaceutical chemical industry from 2010 to 2030 – nearly half of all American chemical jobs. That would likely mean a loss of 30,000 jobs in Texas and 10,000-20,000 in Ohio, California, Illinois, New Jersey, New York, Tennessee, Louisiana, Pennsylvania, and North Carolina.[40]

However, chemical industry employment in the US may get a new lease on life as a result of the process called "hydraulic fracturing" or "fracking" that increases the extraction of natural gas from shale. According to the American Chemistry Council,

Access to vast, new supplies of natural gas from previously untapped shale deposits is one of the most exciting domestic energy developments of the past 50 years. After years of high, volatile natural gas prices, the new economics of shale gas are a "game changer," creating a competitive advantage for U.S. petrochemical manufacturers, leading to greater U.S. investment and industry growth.[41]

Fracking may help the chemical industry in several ways. Fracking uses a wide range of chemicals produced by the chemicals industry. (Just what chemicals are used is unknown to the public because of a special legal loophole that exempts fracking from even the modest right-to-know regulations that apply to other chemicals.) Since natural gas can be used as a "feedstock" (raw material) for petrochemical production, if it becomes less expensive the chemical industry can save money. And, since chemical production takes a lot of energy, more money can be saved by using inexpensive natural gas as a fuel.

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[38] Heintz and Pollin, p. 31, 2009 prices.
[39] Heintz and Pollin, p. 5. The figures include pharmaceuticals. Note that foreign companies also employ a substantial number of workers in the US.
[40] Heintz and Pollin, Figure 3, p. 10.
[41] American Chemistry Council, "Shale Gas and New Petrochemicals Investment: Benefits for the Economy, Jobs, and US Manufacturing," March 2011. See also: http://www.americanchemistry.com/ACC-Shale-Report

It is too early to tell how much truth is behind the buzz about new jobs in the chemical industry as a result of fracking. So far it is hardly a jobs "game changer." Chemical industry jobs decreased from 880,600 at the end of 2004 to 782,500 at the pit of the recession in 2011. By the end of 2013 they had only rebounded to 794,900, in spite of the alleged boom from fracking and cheaper natural gas.[42] Some new jobs have resulted from the expansion of chemicals used in fracking. Some old chemical plants are being converted to natural gas. However, it is uncertain how long the "gas boom" will last. Costs of fracked natural gas are likely to rise as the most accessible wells are exhausted. And natural gas, like other fossil fuels, is sold in a competitive global market, making it hard to maintain a lower US price in the long run.

Killer Chemicals

Chemicals can be hazardous to human health and the environment. But those hazards can be reduced enormously. In many cases, safer chemicals can be developed and substituted for more hazardous ones. Chemicals can be modified so that they can be handled more safely and so that they break down more rapidly into safer components. In those cases where doing without hazardous chemicals produces unacceptable hardships, they can be isolated from contact with people and the environment and their quantity can be reduced by continuous recycling. Exposure and release can be reduced by having a sufficient number of skilled, experienced workers who are empowered to enforce safe practices and insist on proper maintenance of equipment.

Unfortunately, instead of investing in a transition to safer chemicals and production techniques, the American chemical industry has devoted itself to cutting labor costs and fighting against requirements for safer materials and processes. As a result, the chemical industry is one of the most dangerous for those who work in it, those who live near it, and those who use its products.

While the secrecy of the chemical industry makes it difficult to evaluate toxic hazards fully, the available information is anything but reassuring. For example, a study published by the California Policy Research Center at the University of California surveyed deaths linked to occupational health and safety caused by chemical exposures.[43] They found that chemical exposure was a factor in 80-90% of cancer deaths, 100% of occupational lung disease deaths, 40-50% of deaths from neurological disorders, and 40-50% of deaths from renal disorders.

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[42] US Department of Labor, Bureau of Labor Statistics, Employment, Hours, and Earnings from the Current Employment Statistics survey (National) Series ID: CES3232500001, Seasonally Adjusted Super Sector: Nondurable Goods Industry: Chemicals NAICS Code: 325 Data Type: ALL EMPLOYEES, THOUSANDS.

[43] Michael Wilson with Daniel Chia and Bryan Ehlers, *Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation.* (Berkeley: California Policy Research Center, University of California, 2006).

While those who work in the chemical industry are likely to be most vulnerable to exposure to chemical hazards, millions of workers "downstream" use the products they produce and are also vulnerable to these devastating effects of chemical exposure.

The same is true of the communities where hazardous chemicals are produced and used. Once again, the chemical industry interferes with efforts to adequately evaluate these hazards, but what is known provides ample cause for concern. The threat is most severe for vulnerable, exposed groups, especially children. Studies indicate that chemical exposure plays a role in 100% of childhood lead poisoning, 10-35% of asthma, 2-10% of certain cancers, and 5-20% of neurological problems.[44] And since plants making and using toxic substances are disproportionately located in communities of color, these groups are most likely to be exposed to health-destroying chemical hazards.[45]

It is sometimes argued that environmental and workers health and safety regulations "kill jobs" by making companies less competitive. The exact opposite is true: Safer plants often mean more and better jobs.

The chemical industry's drive to cut labor costs aggravates chemical hazards for workers and communities. Reducing, stalling, and skimping on safety procedures increases worker exposure and the likelihood of accidents. Cutbacks in maintenance lead to a higher likelihood of accidents. Weakening worker job security protections and replacing permanent workers with temps and other contingent workers reduces workforce skills and ensure an inexperienced workforce. Cutting the workforce and speeding up production creates accidents. An adequate, trained, and stable workforce is essential for a safe chemical industry. Unionized workers are often the best first line of defense for any community near a chemical plant because they are better trained in health, safety and environmental matters, and they have whistle-blower protection -- the union.

An unsafe chemical industry also leads to spills, releases, explosions, and other catastrophic accidents that directly destroy jobs and indirectly serve as a drag on the industry. For example, in 1995 when the Lodi, New Jersey plant of Napp Technologies exploded, killing four workers, the company simply closed the plant and moved away.

Unsafe chemistry is a drag on company finances. Environmental lawsuits and toxic releases reduce the market value of US chemical firms by an estimated 31% of replacement value of assets, about $200 billion.[46] The chemical industry

[44] Heintz and Pollin, p. 4. See also Philip J. Landrigan, Clyde B. Schechter, Jeffrey M. Lipton, Marianne C. Fahs, and Joel Schwartz, *Environmental pollutants and disease in American children: estimates of morbidity, mortality, and costs for lead poisoning, asthma, cancer, and developmental disabilities.* (Environmental Health Perspectives, 110(7)).
[45] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1757035/pdf/v058p00024.pdf
[46] Heintz and Pollin, p. 4.

has the largest pollution abatement costs of any manufacturing sector, estimated at $5.2 billion in 2005 -- 25% of all manufacturing pollution abatement.[47] These are costs that would be sharply reduced by a chemical industry that invested more heavily in replacing current hazardous products and processes with safer ones.

A Rogue Industry?

What does the chemical industry achieve by its greenwashing campaigns and political clout? What is it protecting through its secrecy and opposition to effective regulation?

In May, 2012, the *Chicago Tribune* ran a series of four investigative reports that help answer those questions for one of the industry's most controversial and potentially hazardous products, so-called flame or fire retardants. The reports detail how "Manufacturers of fire retardants rely on questionable testimony [and] front groups to push standards that boost demand for their toxic – and ineffective – products."[48] They reveal a "decades-long campaign of deception that has loaded the furniture and electronics in American homes with pounds of toxic chemicals linked to cancer, neurological deficits, developmental problems, and impaired fertility."

The reports exposed the organization "Citizens for Fire Safety" which has lobbied for government policies supporting the purported chemical "fire retardants." Citizens for Fire Safety is actually a trade association whose only three members are the three largest manufacturers of flame retardants. The *Chicago Tribune* revealed that burn specialist Dr. David Heimbach, who later admitted he had been paid by the organization, testified before a California hearing about a 7-week old baby girl who was burned to death on a pillow without flame retardants. The pitch was heart-rending. "Now this is a tiny little person, no bigger than my Italian greyhound at home." She ultimately died "after about three weeks of pain and misery in the hospital." Sound like a good argument for fire retardants? The *Chicago Tribune* investigation discovered that "The baby he described didn't exist." Dr. Heimbach made the story up. And scientists at the U.S. Consumer Product Safety Commission maintain that the fire retardants in household furniture simply aren't effective.

The *Chicago Tribune* reports also explained how the industry has "twisted research results, ignored findings that run counter to its aims and passed off biased, industry-funded reports as rigorous science."[49] For example, the

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[47] Heintz and Pollin, p. 4, 20.
[48] Patricia Callahan and Sam Roe, "Fear fans flames for chemical makers," *Chicago Tribune*, May 6, 2012.
[49] Patricia Callahan and Sam Roe "Distorting Science," *Chicago Tribune*, May 9, 2012.

American Chemistry Council (ACC) says that "ACC's work is grounded in scientific evidence." However, when the *Tribune* asked the ACC for research on fire retardants, the ACC initially provided only one study, conducted by Vytenis Babrauskas of the National Bureau of Standards. When the *Tribune* showed Babrauskas the claims the ACC was making based on his research, he responded that the industry official had "grossly distorted" the findings of his research. In fact, fire retardants in typical home furnishings offer little or no fire protection. "Industry has used this study in ways that are improper and untruthful."

Queried about the inadequacy of its "scientific evidence," the ACC provided another study available only in Swedish. The researcher receives funding from the chemical industry. The study claims that flame retardants are effective, extrapolating exclusively from a study of eight TV fires in western Stockholm. The *Tribune* translated the paper and gave it to a retired analyst from the Canadian environmental protection agency, who said of the author's extrapolations, "She's just making these numbers up."[50]

Unsustainable Chemistry

People needs chemicals. But we need chemicals that make the world safer and more sustainable. The American chemical industry is not making the necessary effort to meet that need. It is not investing in research to create the chemicals we need and to replace those that are doing us harm. Instead, it is concentrating on wringing additional profits from the chemicals it has already commercialized in the past by cheapening their production and fighting efforts to encourage their replacement with safer ones.

The threats shared by workers in the chemical industry, other workers who use chemicals, and communities where chemicals are made and used create the natural basis for an alliance to fight bad chemistry and force the transition to good chemistry.

[50] "Distorting Science."

FIXING BAD CHEMISTRY

Is there an alternative to profit-driven bad chemistry? How can we have a chemical industry that invests in producing the new kinds of chemicals the future requires? That thereby produces the good jobs workers need? That promotes effective regulation of hazardous chemicals instead of spending millions to prevent it? Chapter 3 explores how the chemical industry could be transformed by public policy promoting a "green chemistry" that produces the safe chemicals needed for a transition to a sustainable economy.

A "Green Chemistry" Industrial Policy

What society needs from chemistry is brilliantly summarized in the study "Innovation, Chemistry, and Jobs" by the American Chemical Society, the scientific society for the field of chemistry:

> Understanding and managing global climate change; generating and conserving energy and potable water; building a more efficient, less expensive, and more humane health care system producing products that solve problems in the largest, fastest growing markets (those in the developing world); generating new materials for high-technology products such as consumer electronics; energy-efficient transportation systems and buildings; and building a sustainable industrial economy – all will require new chemistry. And it is this *new* chemistry that has the potential to lead to true innovations and to found new industries.[51]

Twelve Principles of Green Chemistry

Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green chemistry applies across the life cycle of a chemical product, including its design, manufacture, use, and disposal.

Twelve "principles of green chemistry," originally developed by Paul Anastas and John Warner, are widely used to guide sustainable chemistry efforts:[52]

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[51] P. 10.

[52] Paul Anastas and John Warner, *Green Chemistry: Theory and Practice* (Oxford University Press: New York, 1998). This summary and explanation of the principles comes from http://greenchem.uoregon.edu/Pages/GreenChemGlossary.php

1 Prevent Waste

The ability of chemists to redesign chemical transformations to minimize the generation of hazardous waste is an important first step in pollution prevention. By preventing waste generation, we minimize hazards associated with waste storage, transportation and treatment.

2 Maximize Atom Economy

Atom Economy is a concept, developed by Barry Trost of Stanford University, that evaluates the efficiency of a chemical transformation. Similar to a yield calculation, atom economy is a ratio of the total mass of atoms in the desired product to the total mass of atoms in the reactants. One way to minimize waste is to design chemical transformations that maximize the incorporation of all materials used in the process into the final product, resulting in few if any wasted atoms. Choosing transformations that incorporate most of the starting materials into the product is more efficient and minimizes waste.

3 Design less Hazardous Chemical Synthesis

Wherever practicable, synthetic methodologies should be designed to use and generate substances that possess little or no toxicity to human health and the environment. The goal is to use less hazardous reagents whenever possible and design processes that do not produce hazardous by-products. Often a range of reagent choices exist for a particular transformation. This principle focuses on choosing reagents that pose the least risk and generate only benign by-products.

4 Design Safer Chemicals and Products

Chemical products should be designed to affect their desired function while minimizing their toxicity. Toxicity and ecotoxicity are properties of the product. New products can be designed that are inherently safer, while highly effective for the target application. In academic labs this principle should influence the design of synthetic targets and new products.

5 Use Safer Solvents/Reaction Conditions

The use of auxiliary substances (e.g., solvents, separation agents, etc.) should be made unnecessary wherever possible and innocuous when used. Solvent use leads to considerable waste. Reduction of solvent volume or complete elimination of the solvent is often possible. In cases where the solvent is needed, less hazardous replacements should be employed. Purification steps also generate large sums of solvent and other waste (chromatography supports, e.g.). Avoid purifications when possible and minimize the use of auxiliary substances when they are needed.

6 Increase Energy Efficiency

Energy requirements of chemical processes should be recognized for their environmental and economic impacts and should be minimized. If possible, synthetic and purification methods should be designed for ambient temperature and pressure, so that energy costs associated with extremes in temperature and pressure are minimized.

7 Use Renewable Feedstocks

Whenever possible, chemical transformations should be designed to utilize raw materials and feedstocks that are renewable. Examples of renewable feedstocks include agricultural products or the wastes of other processes. Examples of depleting feedstocks include raw materials that are mined or generated from fossil fuels (petroleum, natural gas or coal).

8 Avoid Chemical Derivatives

Unnecessary derivatization (use of blocking groups, protection/ deprotection, temporary modification of physical/chemical processes) should be minimized or avoided if possible, because such steps require additional reagents and can generate waste. Synthetic transformations that are more selective will eliminate or reduce the need for protecting groups. In addition, alternative synthetic sequences may eliminate the need to transform functional groups in the presence of other sensitive functionality.

9 Use Catalysts

Catalytic reagents (as selective as possible) are superior to stoichiometric reagents. Catalysts can serve several roles during a transformation. They can enhance the selectivity of a reaction, reduce the temperature of a transformation, enhance the extent of conversion to products and reduce reagent-based waste (since they are not consumed during the reaction). By reducing the temperature, one can save energy and potentially avoid unwanted side reactions.

10 Design for Degradation

Chemical products should be designed so that at the end of their function they break down into innocuous degradation products and do not persist in the environment. Efforts related to this principle focus on using molecular-level design to develop products that will degrade into hazardless substances when they are released into the environment.

11 Analyze in Real-Time to Prevent Pollution

It is always important to monitor the progress of a reaction to know when the reaction is complete or to detect the emergence of any unwanted by-products. Whenever possible, analytical methodologies should be developed and used to allow for real-time, in-process monitoring and control to minimize the formation of hazardous substances.

12 Minimize the Potential for Accidents

One way to minimize the potential for chemical accidents is to choose reagents and solvents that minimize the potential for explosions, fires and accidental release. Risks associated with these types of accidents can sometimes be reduced by altering the form (solid, liquid or gas) or composition of the reagents.

The American chemical industry often gives lip service to the idea of green chemistry and service to social needs. But as we have seen, in practice it is resisting pressures to transition to safe, green chemistry that produces what we

need for a sustainable economy. Is there a way that workers and the public can promote that transition?

Most countries have an industrial policy designed to encourage economic development in selected products and industries. Industrial policy uses a range of techniques including support for research, workforce education and development, subsidies, market creation, loans and investments, regulatory structures, and other techniques.[53] While for much of its history the US used many of the tools of industrial policy, today it is unusual among countries in not having an explicit industrial policy. "Let the market decide" has been the dominant approach to industrial development – which is tantamount to saying, "let the corporations decide."

Remarkably, top officials of Dow Chemicals have become leading proponents of industrial policy for the US. Dow CEO Andrew Liveris wrote a book called *Make It In America*. "We need an industrial policy for the 21st century," he argues. "We became enamored with making money from money. We forgot that making things – real tangible things – still matters."[54]

Some of the basic elements of industrial policy were embodied in the reorganization of the automobile industry by the Federal auto task force after the economic crisis of 2008. The Federal government provided billions of dollars in grants, loans, and investments. But these were not provided as simple bailouts or giveaways. Instead, they were used to transform the industry. Through complex negotiations, the government, the companies, and the union agreed to shift the industry to production of smaller, far more energy-efficient cars built in the US that would substantially reduce climate-threatening carbon emissions. The new standards required carmakers to produce fleets that would be 40% cleaner and more fuel-efficient by 2016.

The new standards that grew out of the auto task force, combined with government grants, loans, and investments under the Recovery Act, led to a substantial growth in automotive and related employment. For example, as part of its plan to meet the new fuel efficiency standards, GM retooled its plant in Lordstown, Ohio, to build the high-efficiency Chevrolet Cruze, bringing 1,200 new jobs to the plant. A study by CERES indicated that the new standards will produce several hundred thousand jobs.[55] The government also provided funding to develop a car battery industry that would serve as the basis for building electric cars and hybrids in the US.[56] They produce batteries that are far less toxic than conventional lead batteries.

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[53] See Robert Pollin and Dean Baker, "Public Investment, Industrial Policy and U.S. Economic Renewal," Political Economy Research Institute and Center for Economic and Policy Research, December, 2009.
[54] "US economic recovery requires new industrial policy – Liveris," ICIS.com, June 15, 2009.
[55] Ceres, *More Jobs Per Gallon* (Washington, DC: July, 2011).
[56] "The Recovery Act: Transforming the American Economy Through Innovation," Executive Office of the President, August, 2010.

A Federal industrial policy for the chemical industry might take off from the concept of the "new chemistry" laid out by the American Chemical Society – a chemistry designed to address climate change, provide safe water, protect health, aid developing countries, and support the transition to sustainable transportation, buildings, and industry. Negotiations among government, industry, labor, and other stakeholders would identify both new needs to address and existing products and processes that require transformation.

Once such goals were identified, the tools of industrial policy could be utilized to realize them. Targeted subsidies to research would create the scientific basis for new production. (The US currently ranks 23rd among economically developed countries in research and development credits.[57]) Investment in education from community colleges through advanced scientific education would expand the pool of trained workers. Targeted public and private investment would create new or refurbished facilities to produce the needed new chemicals, much as the auto industry reorganization did for auto battery production. Public procurement programs would create guaranteed markets for the new products. At the same time a planned, phased shutdown of highly polluting facilities would be conducted in a way that guaranteed jobs and livelihoods for those who work in them.

Protecting the Livelihoods of Workers Affected by Change

While industrial policy, green chemistry, and TSCA reform can lead to more jobs in the chemical industry, there is always the possibility that some plants will be shut down or some jobs lost. The principle that the cost of policies that benefit society shouldn't be borne by those who are adversely affected by their side effects was recognized in the Trade Act of 1974 and subsequent programs for trade adjustment assistance, which provide compensatory benefits to workers who lose their jobs as a result of US trade policies. The eligibility requirements, benefits, and administration of trade adjustment programs are widely recognized as inadequate, however.

Transition assistance in the past has often meant little more than an economic hospice for workers and communities threatened by the side effects of globalization, environmental protection, and other public policies. Without a clear program to protect workers, the struggle to fix the chemical industry can all too easily come to be perceived as a threat to chemical workers' jobs.

Chemical industry unions and their environmentalist allies have been pioneering advocates of a "just transition" in which workers are protected from having to bear the cost of policies that protect the public and the environment. For example, the Oil, Chemical, and Atomic Workers union led the effort to create a "Superfund for Workers" which would provide financial support and an opportunity for higher education for workers displaced by environmental protection

[57] Vincent Valk, "Dow Kokam and Industrial Policy," *Chemical Week*, June 21, 2010. Data for countries in the Organization for Cooperation and Development.

policies.

Such protections can be included in any program for industrial policy, green chemistry, or TSCA reform. Specifically, workers who lose their jobs because of such policies should receive:

- full wage and benefit replacement for at least three years; and
- up to four years of education or training, including tuition and living expenses; and
- decent pensions with healthcare for those ready to retire

The opportunity for individuals to access higher education and advanced training will also mesh with the need to develop new labor force capabilities for the emerging green economy.

Industrial changes often affect not just individual workers but whole communities, and a just transition also needs to address those impacts. Changes in the chemical industry can emulate the highly successful process that helped local communities adjust to the disruption and job shifting that resulted from the closing of military bases under the Base Realignment and Closing Commission (BRAC). Those communities were provided a wide range of federal assistance, including planning and economic adjustment assistance, environmental cleanup, community development block grants, and community service grants.

Individual workers dislocated by base closings also received extensive support. The Department of Defense itself provided advance notification of a reduction in force; pre-separation counseling; a hiring preference system with federal agencies to reemploy qualified displaced DOD employees; and financial incentives to encourage early retirement of those eligible. Workers affected by base closings were also eligible for help under national emergency grants, rapid response programs, comprehensive assessments and development of individual employment plans, and job training programs.

Communities and individuals affected by chemical industry transitions could be similarly targeted for assistance from such existing programs as the Department of Labor's Rapid Response Services and the national emergency grants of the DOL's Employment and Training Administration, as well as funding for economic development and industrial efficiency and modernization from the Departments of Energy and Commerce.

Perhaps surprisingly, some of the best ideas for protecting workers and communities hit by the side effects of public policy decisions were embodied in legislation championed in 1988 by Sen. John McCain to protect tobacco workers and farmers from negative side effects of tobacco control policy. McCain's Universal Tobacco Settlement bill, which passed out of committee 19–1 but was defeated on the Senate floor, would have created an industry-funded $28 billion trust fund to help tobacco growers, cigarette factory workers, their families, and their communities adjust to the reduced purchase of American tobacco.[58] Workers and farmers would have received transition assistance from the fund if "the implementation of the national tobacco settlement contributed importantly to such workers' separation" from their jobs.

The Tobacco Community Revitalization Trust Fund would offer economic development grants over a twenty-five-year period that would support:

Business development and employment-creating activities "to provide a more viable economic base and enhance opportunities for improved incomes, living standards, and contributions by rural individuals to the economic and social development of their communities."

Activities that "expand existing infrastructure, facilities, and services to capitalize on

[58] Universal Tobacco Settlement Act, S. 1414, 105th Cong. (1997).

opportunities to diversify economies in tobacco communities that support the development of new industries or commercial ventures."

Initiatives and technical assistance designed to "create or expand locally owned value-added processing and marketing operations in tobacco communities."

Preference in employment under the program would be given to former tobacco workers and members of tobacco worker communities.

There are many sources from which an industrial policy for the chemical industry can grow. Many foreign countries, notably Germany and China, are actively pursuing such policies. In the absence of Federal policy, many US states have developed their own industrial policies. [See boxes on Louisiana and Oregon] The proposed US Safe Chemicals Act [see below on TSCA reform] includes some elements of industrial policy, notably Federal research funding.

The Louisiana Scorecard

The book *No More Candy Store*[59] by Greg LeRoy describes how a state policy called the Louisiana Scorecard began to transform the Louisiana chemical industry in the early 1990s – until it was killed by the industry.

Louisiana has historically granted large tax abatements to companies. It also has what may be the nation's worst toxics emissions record. So the state under governor Buddy Roemer decided fight pollution by making half of a company's tax abatement conditional on a "Scorecard" rating its environmental performance.

Half the Scorecard was based on emissions per job. The more points a company received, the larger abatement it could get. If a company emitted10,000 pounds per job or more annually, it received zero points. If it emitted 500 pounds per job or less annually, it received 25 points.

The other half of the Scorecard was based on environmental compliance. A company applying for a tax abatement lost points on the Scorecard if it had been convicted of previous environmental violations. A serious violator could lose 25 points.

Companies could offset bad scores by reducing emissions (one point per 2% annual reduction, with a minimum 5% reduction to qualify); by installing recycling systems (up to five points); by recycling or producing consumer products with recycled materials (up to ten points); by creating jobs in areas of high unemployment (up to 15 points); or by providing industrial diversification (up to ten points for low or non-

[59] Greg LeRoy, *No More Candy Store* (Washington, DC: Good Jobs First, 1997). LeRoy's account appears at http://www.goodjobsfirst.org/sites/default/files/docs/pdf/nmcs.pdf and has been slightly edited here.

polluting industries which were not common in Louisiana and which provided high-pay, high-skill jobs).

According to the state's environmental director, the Scorecard achieved pledges of a 40-million pound (8%) reduction in toxic pollutants and a 140-million pound reduction in air pollutants. It also improved revenues to local governments by $6 to $7 million. All the companies' scores were published, and some plant managers began competing with each other for better scores. Workers and neighbors could learn from the scores why one plant was better or worse than others.

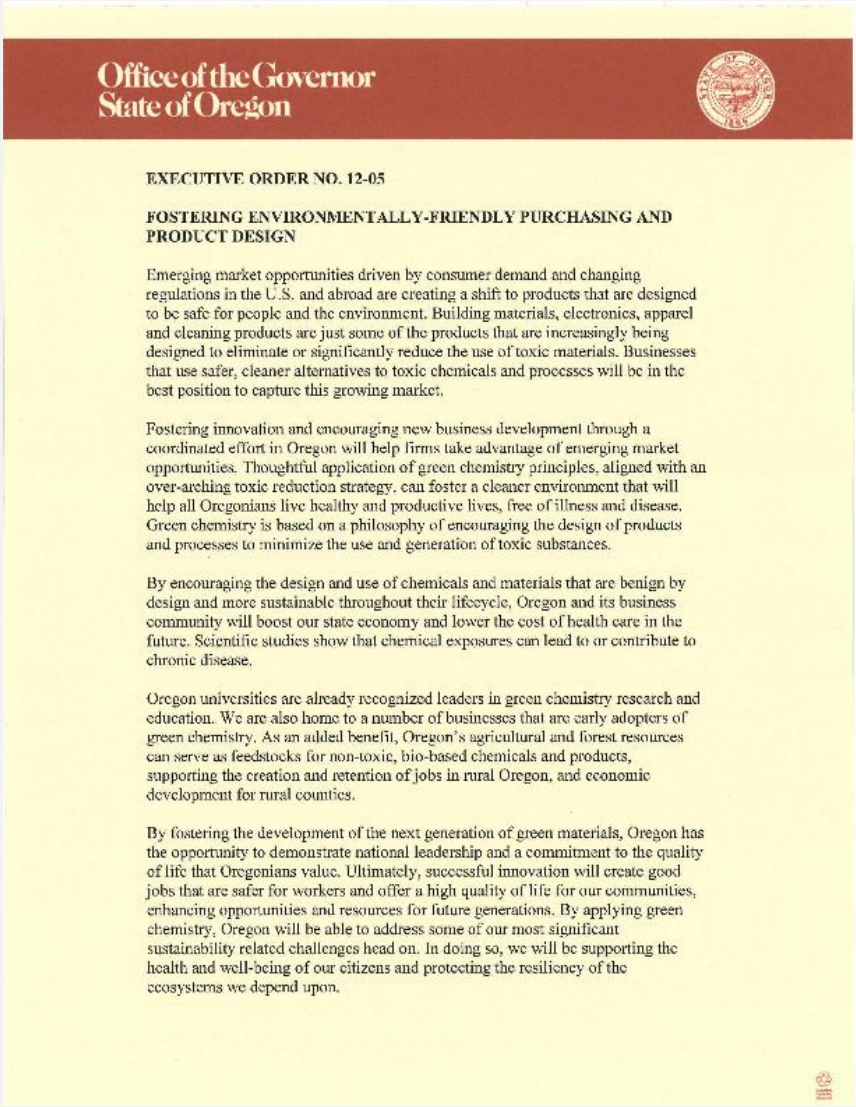
The Scorecard had the greatest impact on Louisiana's chemical industry, source of 90% of the state's toxic pollution. The industry averaged 14,000 pounds of emissions per job (100 times that of New Jersey). A company with10,000 pounds or more lost 25% of its tax abatement. Many chemical companies tried to make up the loss by reducing emissions or increasing recycling.

Chemical industry employment had been declining in Louisiana before 1988. But as the new abatement requirements appeared on the horizon in 1988 and then went into effect in 1991, the industry created 3,500 new jobs, a 15% increase. That was due to a 1988-1991 surge in pollution control spending, from $90 million per year to $291 million. The result was thousands of new jobs in the Louisiana chemical industry -- an estimated 23 jobs per $1 million in capital spent for pollution controls.
The chemical industry claims a job-multiplier effect of 4.6 additional jobs for every chemical industry job, so thousands of additional jobs were created as well. For the first time in recent history, Louisiana's unemployment rate dropped below the U.S. average, and poorer areas in the southern part of the state especially benefitted.

However, the chemical interests disliked the precedent of accountability, especially the subsidy penalties for past violations. At the industry's behest, newly-elected Gov. Edwin Edwards eliminated the Scorecard as his first official act in office just two days after his inauguration in January, 1992. Louisiana's environmental enforcement, as measured by fines assessed, dropped 70% in Edwards' first year in office.

Green Chemistry in Oregon

In the vacuum left by Federal policy, many states have developed their own "Green Chemistry" initiatives. For example, in April, 2012 Oregon governor John Kitzhaber, MD issued Executive Order 12-05 detailing a wide range of strategies for the state to promote green chemistry and a green chemical industry, including use of government purchasing power, encouraging preferential purchasing in the private economy, supporting relevant research, and development action plans to reduce production and use of chemicals of concern. The Executive Order begins:



Office of the Governor
State of Oregon

EXECUTIVE ORDER NO. 12-05

FOSTERING ENVIRONMENTALLY-FRIENDLY PURCHASING AND PRODUCT DESIGN

Emerging market opportunities driven by consumer demand and changing regulations in the U.S. and abroad are creating a shift to products that are designed to be safe for people and the environment. Building materials, electronics, apparel and cleaning products are just some of the products that are increasingly being designed to eliminate or significantly reduce the use of toxic materials. Businesses that use safer, cleaner alternatives to toxic chemicals and processes will be in the best position to capture this growing market.

Fostering innovation and encouraging new business development through a coordinated effort in Oregon will help firms take advantage of emerging market opportunities. Thoughtful application of green chemistry principles, aligned with an over-arching toxic reduction strategy, can foster a cleaner environment that will help all Oregonians live healthy and productive lives, free of illness and disease. Green chemistry is based on a philosophy of encouraging the design of products and processes to minimize the use and generation of toxic substances.

By encouraging the design and use of chemicals and materials that are benign by design and more sustainable throughout their lifecycle, Oregon and its business community will boost our state economy and lower the cost of health care in the future. Scientific studies show that chemical exposures can lead to or contribute to chronic disease.

Oregon universities are already recognized leaders in green chemistry research and education. We are also home to a number of businesses that are early adopters of green chemistry. As an added benefit, Oregon's agricultural and forest resources can serve as feedstocks for non-toxic, bio-based chemicals and products, supporting the creation and retention of jobs in rural Oregon, and economic development for rural counties.

By fostering the development of the next generation of green materials, Oregon has the opportunity to demonstrate national leadership and a commitment to the quality of life that Oregonians value. Ultimately, successful innovation will create good jobs that are safer for workers and offer a high quality of life for our communities, enhancing opportunities and resources for future generations. By applying green chemistry, Oregon will be able to address some of our most significant sustainability related challenges head on. In doing so, we will be supporting the health and well-being of our citizens and protecting the resiliency of the ecosystems we depend upon.

http://cms.oregon.gov/gov/docs/executive_orders/eo_12-05.pdf

Chemicals and Climate Change

In today's world, industrial policy is usually closely connected with energy and climate policy. Protecting the earth's climate requires a major shift from fossil fuels to renewable energy and conservation. That in turn requires both a transformation of industry and a transformation of the entire economy to a low-carbon basis.

This is recognized in principle by Dow Chemical. According to Carol Williams, Dow's Executive Vice-President, "Almost every other country in the world has

an energy policy, and we do not." To restore prosperity, the US needs "integrated environmental policies that encourage sustainability, that protect our earth and that safeguard our neighbors."[60]

Dow's "Energy Plan for America" pushes for aggressive energy efficiency and conservation. It also calls for reducing greenhouse-gas emissions, increasing both the supply and variety of domestic energy supplies, and accelerating the development of alternative and renewable energy.[61] According to Williams,

A key example of innovation on the advanced manufacturing side is our solar shingles. With these, instead of having to build a roof and then a separate roof for the solar panels, the panels get integrated right into a shingle. It's essentially an electrical system that gets embedded into a shingle. So that's one example of a chemical company combining our material science capability with some of the global trends that are required for the world. That manufacturing is being done in Midland [Michigan], which is where our headquarters is.

Product development was assisted by a Federal R&D tax credit. (Williams did not comment on how many installation jobs may be eliminated by this new technology.)

The chemical industry uses large amounts of petroleum and natural gas both as raw material ("feedstock") and to provide energy for production processes. One of the crucial principles of green chemistry is to "Use renewable raw material or feedstock" whenever practicable. Unfortunately, the American chemical industry is going in exactly the opposite direction. It is portraying the increased availability of natural gas as a result of the process called "hydraulic fracturing" or "fracking" as a boon to the future of the industry. And it is advocating the radical expansion of fracking, despite its devastating effects on local environments and the global climate. The chemical industry also hopes to gain by producing the many chemicals that are used in the fracking process.

The chemical industry could play a major role in developing and producing alternative, climate-safe fuels. For example, nonfood biofuels like wood chips and algae could someday be produced at as little as $1 a gallon and substitute for up to half of the gasoline consumed by American cars.[62] A study by the University of Michigan at Amherst finds that biofuel based production creates substantially more jobs than fossil fuel based production. Shifting 20% of plastics production from current fossil fuels to biofuels, they estimate, would produce 104,000 new jobs throughout the American economy.[63]

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[60] Jonathan Katz, "Dow Chemical's Recipe for Competitiveness and Innovation," *IndustryWeek*, March 11, 2012. http://www.industryweek.com/archive/dow-chemicals-recipe-competitiveness-and-innovation

[61] "US economic recovery requires new industrial policy – Liveris," ICIS.com, June 15, 2009.

[62] Steve Lohr, "In U.S., Steps Toward Industrial Policy in Autos," *New York Time*s, May 20, 2009.

[63] Heintz and Pollin, p. 32.

Regulating Chemical Hazards

The US chemical industry is regulated by the Toxic Substances Control Act (TSCA), which was passed in 1976.[64] It has loopholes so large that under it the EPA has been able to require less than 300 of the 80,000 chemicals produced in the United States even to be tested for safety -- and only three of those have ever been restricted.

Environmental groups, the Steelworkers and other unions, and the BlueGreen Alliance have joined to propose reform of TSCA to close its loopholes and eventually require that all chemicals produced and/or sold in the US be proven safe. Workers, communities, and environmentalists have a common interest in implementing such legislation.

In the past, a series of highly publicized chemical disasters like Love Canal and Bhopal alerted the American public to the threat chemicals can pose to human health. But today, much of the public simply assumes that the chemical industry is regulated by government agencies that prevent dangerous chemicals from entering the environment and poisoning land, air, water, and people. Unfortunately, that is very far from the case.

TSCA does not require companies to prove that the chemicals they produce are safe. Indeed, even where there is a reasonable suspicion that a chemical may be harmful, TSCA does not give the EPA authority to regulate it. Before it can regulate a product under TSCA, the EPA must demonstrate that the product is harmful.[65] But the EPA has limited resources to test products – a condition the chemical companies have done much to ensure. And the standard for harmfulness that the EPA must meet is extravagant – courts have interpreted TSCA to forbid the EPA from regulating even such a terrifying substance as asbestos. Chemicals are not required to be safe, only to present an "unreasonable risk." And in those rare cases when the EPA requires companies to comply, the requirements must be limited to the solution that is "least burdensome to industry."

When TSCA was passed in 1976, it "grandfathered in" 62,000 existing chemicals. Companies aren't even required to provide more than minimal information about them, let alone prove them safe.[66] The result: The EPA has been able to require fewer than 300 of the 62,000 chemicals grandfathered

[64] For background on the origins and implementation of TSCA, see Craig Collins, Toxic Loopholes (Cambridge: Cambridge University Press, 2010) chapter 5, "TSCA: The Toothless Tiger."

[65] Heintz and Pollin, p. 3. On the inadequacy of chemical industry regulation, see also "Toxic roulette," *Chicago Tribune*, May 10, 2012.

[66] Heintz and Pollin, p. 3.

under TSCA to be tested.[67]

For new chemicals, TSCA has somewhat stronger requirements. Companies must provide basic information on processing, the volume produced, and the number of employees exposed in the workplace. But companies are under no obligation to prove the new chemicals they introduce are safe.

Even where TSCA requires companies to provide it information on the chemicals they make, that information can often remain secret. If the companies can validate a claim that the facts are proprietary "trade secrets," the EPA is required to conceal them from the public and even the purchasers and users of the chemicals.

This means that the cost of hazards is "externalized" – displaced onto others. The result is what economists call "market failures." The chemical companies have little incentive to produce new, safer chemicals, because the hazards of unsafe chemicals is borne by the "downstream" purchasers, users, and neighbors. But the purchasers and users are kept in the dark about the toxic substances they are supplied by the chemical companies. They can't demand safer chemicals – or even shop for the safest available chemicals -- because they are denied reliable, impartial information about the chemicals they are provided. The chemical industry's culture of secrecy prevails over the needs of the public and even of their own customers.

The most obvious flaw in this dubious "system of regulation" is that it doesn't effectively protect the public against the threat of toxic chemicals. TSCA's inadequate regulation directly contributes to the chemical devastation of workers, communities, and the environment detailed in Chapter 2.

But there are subtler downsides as well. Because TSCA provides less stringent regulation for chemicals that existed before 1976, it discourages investment in new, safer chemicals. Because it displaces the costs of toxic effects onto others, it removes the incentive to find and commercialize safer chemicals. The US industry's lack of an effective regulatory framework ensuring reliable information and protections to customers is a significant competitive disadvantage, predictably leading to loss of domestic and international markets and therefore to further job losses. All of these in turn impede the development of the kind of chemical industry that can provide good, safe, stable jobs for the future.

REACH

Other countries have recently modernized their regulation of chemicals, putting the US at a comparative disadvantage. The European Union (EU), the US's main competitor in chemical production, is currently implementing a

[67] Heintz and Pollin, p. 16.

comprehensive program for "Registration, Evaluation, Authorization, and Restriction of Chemical Substances" [REACH]. The program began in 2007 and is being implemented over an 11-year period.

Chemical manufacturers and importers must test their products for environmental health and environmental safety, with high-volume chemicals required to meet more stringent standards. Then EU governments evaluate the tests and assess the hazards. Chemicals of high concern – including ones that cause cancer, genetic mutations, or birth defects, or are persistent and bio-accumulative -- require special authorization and can only be used for specific purposes. Chemicals that pose unacceptable risks to health or the environment can be partially or completely banned.[68] While REACH aims where possible to phase out unsafe chemicals, it makes provision for cases where there is no feasible alternative, high social benefit, or adequate control.

REACH corrects many of the limitations that make TSCA so ineffective. It applies the same standards to existing and new chemicals. It applies the same standards to chemicals produced within the EU and those imported from abroad. While the US's TSCA only limits chemicals that pose an "unreasonable risk" and then requires a "least burdensome to industry" solution, REACH makes health and environmental impact the basic standard for regulation. It also makes far more information available to the public.

REACH incorporates a strategy for setting regulatory priorities and phasing in new requirements. Chemicals that are used in large quantities require more testing. Chemicals designated "substances of very high concern," such as those that are persistent, bioaccumulative, and toxic (PBT) require special authorization. While new chemicals must be proven safe before being introduced, safety requirements for existing chemicals are being phased in.

TSCA Reform Legislation

From 2005 to his death in early 2013, the late Senator Frank Lautenberg (D-NJ) backed by a wide public interest coalition, repeatedly proposed legislation in Congress to reform the Toxic Substances Control Act. Dubbed the Safe Chemicals Act, the legislation required chemical companies to submit a minimum set of data for each chemical they produce, whether old or new. The EPA could then require more data and additional testing for chemicals that could pose an unacceptable risk. Information would be made widely available to purchasers, users, and the public. The EPA would prioritize action based on probable risk and require expedited action where the risk is highest.[69] The bill

[68] Frank Ackerman, Elizabeth A. Stanton and Rachel Massey, "European Chemical Policy and the United States: The Impacts of REACH," p. 2.
http://www.ase.tufts.edu/gdae/Pubs/rp/US_REACH.pdf

[69] Heintz and Pollin, p. 18.

would also provide incentives for safer alternatives, fund research grants, and establish research centers for green chemistry.

The Safe Chemicals Act would correct many of the inadequacies in TSCA. It would put the burden of proof on companies to demonstrate that their products are safe. It would eliminate the grandfathering of existing chemicals by applying the same standards to old and new products. Its requirements would apply equally to imported and domestic chemicals.

The most obvious effect of such a reform of TSCA would be safer jobs, healthier communities, and a less threatened planet. It would mean more incentive to produce safer chemicals and produce them in safer ways. It would mean less pollution, better health, and a more stable climate. The chemical industry would be better able to play its much-needed role in supporting the emergence of a sustainable economy.

Reform of TSCA could also mean more jobs. New, greener industries can often generate more demand for jobs. With the advantage of existing over new chemicals removed, companies will have more incentive to innovate. They will have an incentive to seek and create new markets. Effective regulation will create a greatly expanded market in the development and production of new, safer products, which in turn will require a substantial number of new jobs.

Without TSCA reform, however, the existing regulatory regime will just perpetuate the current trend toward sending chemical industry jobs offshore. The US chemical industry will continue to favor grandfathered chemicals. It will be shut out of markets in countries with modern regulatory regimes. Competing on costs, it will seek out lower labor costs abroad.[70] The result will be the continued hemorrhaging of American jobs.

The chemical industry often argues that more effective regulation will hurt jobs by raising production costs and making companies less competitive. This argument is not credible.
REACH costs for registering and testing chemicals are expected to be less than 1 percent of sales for the whole life of each product.[71]

The argument that regulation leads to job loss is also refuted by the record of those chemicals that are regulated under other US laws and agencies. For example, pharmaceuticals are closely regulated by the Food and Drug Administration (FDA). Yet from 1992 to 2010, pharmaceutical employment grew by 24% while non-pharmaceutical chemical production, regulated only by the ineffectual TSCA, fell by 38%.[72]

[70] Heintz and Pollin, p. 34.
[71] Heintz and Pollin, p. 5.
[72] Heintz and Pollin, p. 8-9.

In May, 2013, a month before his death, Sen. Lautenburg's name appeared on a bill called the Chemical Safety Improvement Act which quickly won support from many Senate Republicans and the chemical industry. The proposed law purported to reform TSCA, but it failed to include many of the reforms that Lautenburg had championed for the previous decade. After Lautenburg's death the bill was promoted by its main Republican sponsor, Sen. David Vitter (R-LA). It was opposed by Sen. Barbara Boxer (D-CA), chair of the Senate Environment and Public Works Committee, who continued to support the Safe Chemicals Act. Most of the groups that had supported the Safe Chemicals Act opposed Sen. Vitter's bill as written, although many expressed willingness to negotiate changes that would strengthen it.[73] Meanwhile, the bill languished in committee.

In February, 2014 Rep. John Shimkus (R-IL) proposed a new law, the "Chemicals in Commerce" Act, also designed to modify TSCA. Cal Dooley of the American Chemistry Council quickly endorsed it. "The balanced approach taken in the draft Chemicals in Commerce Act will provide Americans with more confidence in the safety of chemicals, while at the same time encouraging innovation, economic growth and job creation by U.S. manufacturers."[74]

The response of the coalition that supports the Safe Chemicals Act, in contrast, was strongly negative. Andy Igrejas, director of the coalition Safer Chemicals, Healthy Families -- which includes 450 organizations including the United Steel Workers, the United Auto Workers, and the BlueGreen Alliance – commented, "The draft ignores nearly every recommendation for reform made by health professionals, environmental experts, and advocates for families dealing with cancer, autism, infertility and other health problems linked to chemical exposure, but it adopts the wish list of oil and chemical companies like Dow and ExxonMobil."[75] Anna Fendley of the United Steelworkers Union, which represents the majority of unionized chemical workers in the U.S., testified that the Chemicals in Commerce Act "would result in a less protective, less functional federal system for assessing and restricting industrial chemicals."[76]

According to Safer Chemicals, Healthy Families, the Chemicals in Commerce Act would among other things:

[73] Mark N. Duvall and Alexandra M. Wyatt, "House Republicans Release Draft Toxic Substances Control Act (TSCA) Modernization Legislation," *National Law Review*, March 6, 2014.
[74] "ACC Welcomes Draft House Legislation to Update TSCA," media release, American Chemistry Council, February 27, 2014.
[75] "House Chemical Bill Fails to Protect Public from Toxic Chemicals," Safer Chemicals Healthy Families, media release, February 28, 2014.
[76] Testimony of Anna Fendley, MPH United Steelworkers before the Subcommittee on Environment and the Economy on the "Chemicals in Commerce Act of 2014" March 12, 2014, Washington, DC.

- Annul laws in Maine, Washington, California, Minnesota and several other states that provide most of the information on toxic chemicals in consumer products.

- Continue the legal standard and other hurdles in current TSCA that prevented EPA from taking action on asbestos

- Make it nearly impossible for EPA to require health information for new chemicals before they end up on the market and in the products we bring into our homes. (This is one of the few areas where EPA currently has some authority.)

- Significantly roll back EPA's authority to restrict the use of existing toxic chemicals in products.

- Contradict the recommendations of the National Academy of Science and the American Academy of Pediatrics for how chemical safety should be reviewed.

- Require EPA to weigh the economic benefits of a chemical -- like whether it leaves streaks on your windows- against whether it causes birth defects, cancer, autism, or infertility.[77]

According to the National Conference of State Legislators, the Shimkus bill would "essentially eliminate state policymakers' ability to regulate toxic chemicals at the state level." At least 22 states have toxic chemical laws that are stronger than TSCA. For example, largely as a result of citizen campaigns, twelve states currently outlaw products that include flame retardants like polybrominated diphenyl ethers. The Shimkus bill would nullify such laws. Such preemption is one reason the chemical industry is supporting the Shimkus bill; according to Roger Harris, chairman of the National Association of Chemical Distributors, EPA preemption of state laws "is of fundamental importance in maintaining national markets and retaining business support for reform."[78]

Michael Belliveau, executive director of the Environmental Health Strategy Center, portrayed the bill as a response to the growing demand for protection against unsafe chemicals. "The chemical industry realizes that they're being hammered in the marketplace when you have Wal-Mart and Target specifying safer substitutes to dangerous chemicals in their supply chain. When you have some 30 states that have passed laws, when you have major trading partners in Europe that are far ahead of the United States, the chemical industry is not able

[77] "House Chemical Bill Fails to Protect Public from Toxic Chemicals," Safer Chemicals, Healthy Families, February 28, 2014.
[78] Reid Wilson, "States fight chemical industry over proposed rules," *Washington Post*, March 13, 2014.

to effectively compete in that patchwork of state and marketplace restrictions. That's why they want federal reform." But the reform proposed in the Chemicals in Commerce Act "holds onto the worst features of the current law and rolls back those that are actually working a bit."[79]

Workers Protect Themselves

How can workers discover the hazards associated with the chemicals they are exposed to on the job and investigate safer alternatives?

A new Internet tool, the Chemical Hazard and Alternatives Toolbox (ChemHAT) has been designed by workers in the Communications Workers, Auto Workers, Steelworkers, and other unions with support from the BlueGreen Alliance to make it easier for workers to learn about chemicals. The free, searchable database of the scientific findings on the short and long-term health effects of over 10,000 commonly used chemicals can be accessed at www.chemhat.org ChemHAT aims not only to provide information on hazards; it is collecting information on safer chemicals and processes that can be substituted for dangerous ones.

The ChemHAT website also includes information on workers rights to a safe workplace and guidance for how unions can negotiate with their employers for safer chemicals (http://www.chemhat.org/for-workers/bargaining-safer-chemicals).

[79] Michael Belliveau interview, "Environmental Health Strategy's Belliveau discusses latest House TSCA reform draft," OnPoint, E&E Publishing, March 12, 2014.

CONCLUSION: A LABOR VISION FOR A SUSTAINABLE AND SUSTAINING CHEMICAL INDUSTRY

Our current chemicals industry has been shaped by the reckless pursuit of short-term profits at the expense of worker health, community wellbeing, and long-term employment security. Yet the chemicals industry could be a crucial part of reconstructing our economy on an economically, socially, and environmentally sustainable basis. Such an industry will take time to build, but we can ensure that the changes we make today are steps in the right direction.

Replacing bad chemistry with good jobs in a sustainable, green chemistry industry requires an alliance among the stakeholders who would benefit from good chemistry -- workers, environmental advocates, community members, consumers, and advocates for public health and safety. When faced by efforts to impose public accountability, the chemical industry has often turned to a divide-and-conquer strategy, playing different groups off against each other by framing the issue as "jobs vs. the environment." But there is a long tradition of joint advocacy in support of programs that benefit both workers and the environment, such as right-to-know laws, chemical regulation, and a just transition for workers whose livelihoods are affected by environmental protection.

Protecting workers and the environment requires making chemical corporations more accountable to democratic control. It requires giving workers, consumers, community members, representatives of the public, and other stakeholders greater voice in shaping corporate decisions. It requires empowering workers to see that such stakeholder interests are followed in the day-to-day functioning of the chemical industry. And it requires forms of public regulation that ensure chemical companies are accountable to the public interest.

A decent future for chemical industry workers depends on deepening the alliance with all those who are harmed by bad chemistry and all those who would benefit from a sustainable chemical industry.