



*Is it
necessary?*

*Green chemistry
asks the
prevention
question workers
need answered*

Presented by
Dorothy Wigmore, Worksafe
National COSH conference,
June 4, 2015

WORKSAFE
safety, health, and justice for workers
seguridad, salud, y justicia para los trabajadores

How many chemicals have you used lately?

Quickly, make a list of the chemicals (or products with them) you have used or been around lately. Think about:

- *what might be used at work*
- *what's used to clean your home or workplace*
- *hobbies, maintenance, renovation, garden activities at home*
- *personal care products*
- *dry cleaning*
- *transportation you use*

What do you see?

*And how many of them have been tested?
Won't harm you?*

ILO/WHO:

Goals of occupational health are to:

- ☐ *promote and maintain the highest degree of physical, mental and social well-being of workers;*
- ☐ ***prevent** ill-health among workers caused by their working conditions;*
- ☐ ***protect** workers from factors adverse to their health in their employment; and*
- ☐ *place and maintain workers in occupational environments adapted to their individual physiological and psychological conditions.*

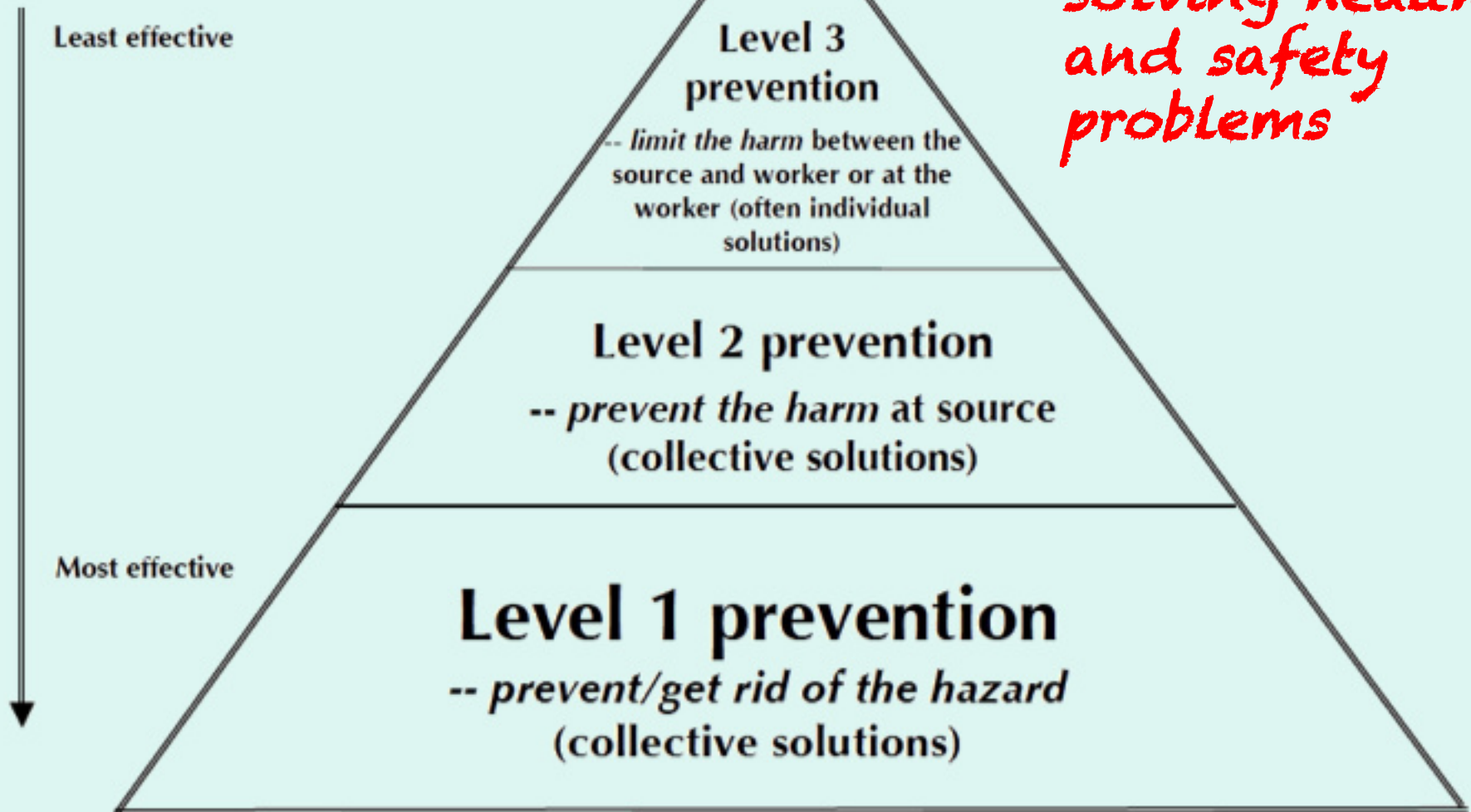
A clear language version is:

- ☐ *promote and keep workers healthy and happy*
- ☐ *prevent workers getting sick because of their job*
- ☐ *protect workers from all hazards on the job; and*
- ☐ *adapt the workplace to workers' mental and physical needs (i.e., use ergonomic principles)*



The prevention triangle:

principles for solving health and safety problems

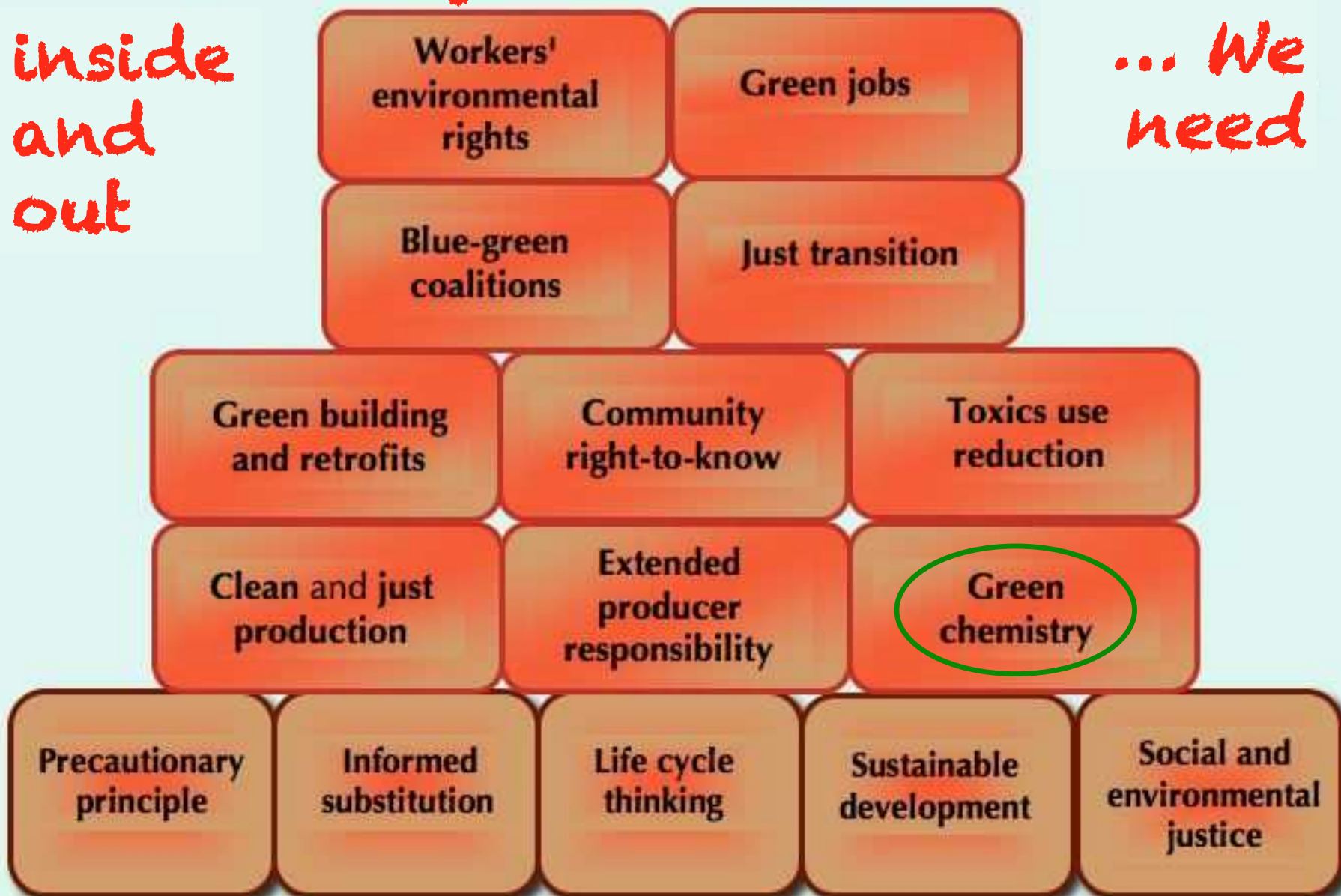


* What happens if it's upside down? It falls over!

For a healthy environment

inside
and
out

... We
need



Why are toxic chemicals used now?



▪ by “accident”?

▪ on purpose?

There is a method to the madness

The reactionary principle - don't worry 'til we have to



- ☐ design new chemicals, materials and technologies without caring how they could affect people's health and/or the environment.
- ☐ demand 100% proof about the harm from each hazard before doing anything about it. Tackle hazards one at a time.
- ☐ expect the public and government to prove something is harmful, after it is on the market, and keep chemical information secret ("confidential business information").
- ☐ use the "Delay game" as long as possible.
- ☐ discourage a public voice – including workers' and consumers' experiences -- about the need to deal with these hazards.

Delay game - the four dog defence



My dog doesn't bite.



My dog bites, but it didn't bite you.



My dog bit you, but it didn't hurt you.



My dog bit you, and hurt you, but it wasn't my fault!

Breast cancer isn't just about genes .. What about work and other environments

Breast cancer, workplace link found

November 19, 2012, 3:01 am • Section: Essex County, News, Windsor

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Occupational health researchers Jim Brophy, left, and Margaret Keith, shown here Nov. 13, 2012, in Tecumseh, Ont., have conducted a study linking occupation with breast cancer risks. Many of the health concerns involve working with plastics. (NICK BRANCACCIO/The Windsor Star)

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A woman's occupation could pose more of a risk to developing breast cancer than smoking or alcohol use, local researchers have found.

Results from a study involving more than 2,000 women in Windsor-Essex and Kent County show a strong link between breast cancer risk and work in jobs classified as "high exposure" to breast cancer-causing substances and hormone disruptors. These jobs include farming, automotive plastics, food canning, metalworking, and bars, casinos and racetracks.

A 2012 study linked breast cancer to work

One especially significant finding was that women who worked in food canning and automotive plastics were **five times** more likely to develop pre-menopausal breast cancer (although the odds are supposed to be much less for them).

And what do they work with?

- ✓ BPA
- ✓ phthalates
- ✓ vinyl chloride/PVC
- ✓ styrene
- ✓ flame retardants (e.g., Tris)
- ✓ and much more

And how did the industry respond?



... It is **concerning** that the **authors could** be over-interpreting their results and **unnecessarily alarm workers**. This study included no data showing if there was actual chemical exposure, from what chemicals, at what levels, and over what period of time in any particular workplace. Although this is an important area of research, these **findings are inconsistent with other research**. This study **should not be used to draw any conclusions about the cause of cancer patterns in workers**.

<http://www.foxnews.com/health/2012/11/19/exposure-to-chemicals-at-work-may-increase-breast-cancer-risk-in-women/#ixzz2DHxj1i8W>

Carol Bristow, 54, worked as a machine operator in a plastic auto parts factory in Windsor, Ontario, for 23 years. She believes on-the-job hazards from toxic vapours and dust played a role in her illness.

<http://www.publicintegrity.org/2012/11/19/11806/study-spotlights-high-breast-cancer-risk-plastics-workers>



In contrast,
the APHA
now has a
policy
called
**Breast
cancer and
occupation:
The need
for action**

*Eliminating hazards is a well-established public health strategy, and there is evidence that **primary prevention** of occupational and other environmental hazards linked to cancers “**reduces cancer incidence and mortality and is highly cost effective.**”[6] As do others using primary prevention approaches, APHA supports use of the **precautionary principle** of taking action in the face of scientific uncertainty.[7]*

*... **Action required** starts with making a national priority of promoting and supporting research on occupational and other environmental causes of breast cancer. Other public health actions include hazard surveillance and **primary prevention activities** such as **reductions in the use of toxic materials, informed substitution, and green chemistry efforts.***



*Science is not
(most of) the
answer*

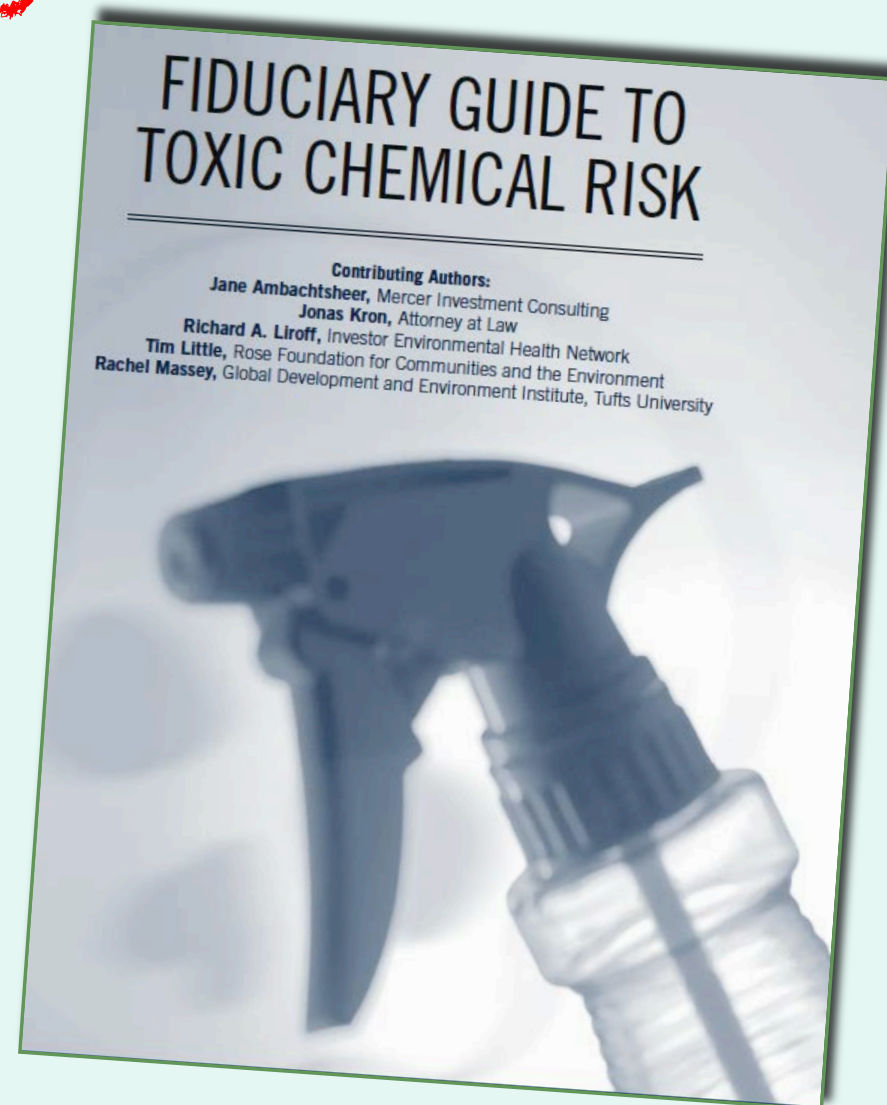
Scientific studies and standards, which are perceived as neutral and objective, have “annihilated our way of knowing” about hazards and overwhelmed workers’ rights. Standards and data banks, like those of the Canadian Centre for Occupational Health and Safety, are based on “industry-sponsored research with predictable results”..

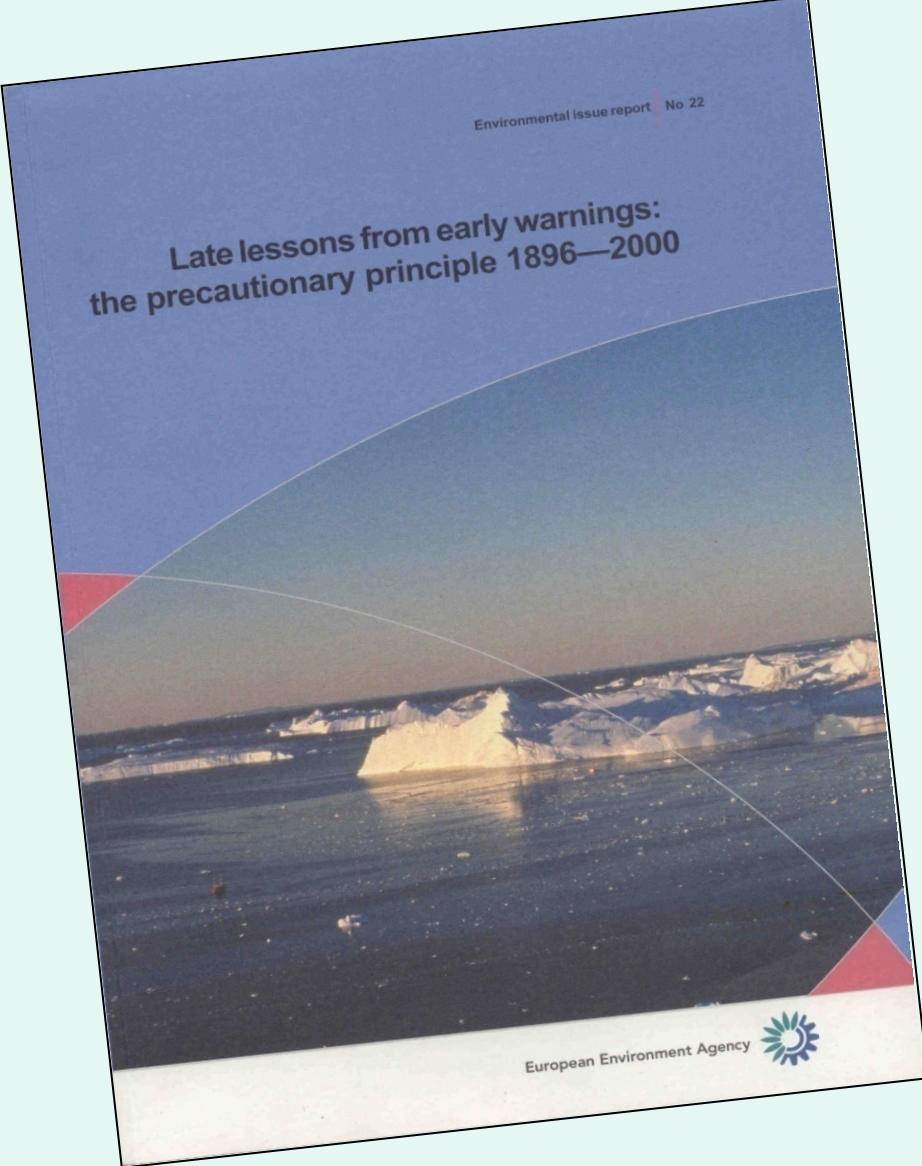
Bob Sass,
described in a Canadian Union of Public Employees (CUPE)
newsletter, 2004

Toxic chemicals cost, impede productivity

If we looked at the U.S. as a whole, the direct cost numbers would be frightening and the combined weight of the indirect costs (of toxic chemicals) would be staggering. But our nation's current systems of economic analysis are largely not geared towards capturing these costs. Therefore, instead of being managed, toxics-related costs act as an unrecognized, but very real and consistent brake on American economic productivity.

The Investor Environmental Health Network,
Rose Foundation for Communities and the
Environment, (2007)
Fiduciary guide to toxic chemical risk





“**Misplaced certainty** about the absence of harm played a key role in delaying preventive actions in most of the case studies” (preface, *Late lessons from Early Warnings: the Precautionary Principle 1896-2000*)

You're running the world. You get to design products and what goes into them.

Pick something from your list.

What "rules" would you put in place so that workers making or using the chemical/product don't get sick?



Hwang Yu-mi died at the age of 23 of leukaemia after working in a South Korean Samsung semiconductor factory. Her job was applying heat to semi-conductor plates and using gas or chemical solution to smooth their surface. After two years of work, she came down with leukemia and died two years after that.

[https://
stopsamsung.wordpress.com/](https://stopsamsung.wordpress.com/)

The precautionary principle -- better safe than sorry



- ✓ Take action to prevent harm, even if we are not sure about (all) the hazards.
- ✓ Shift the “burden of proof” to companies. Before it is sold, used or put on the market, make them prove that something will not harm people or the environment.
- ✓ Look at a lot of options or alternatives. Go for the non-toxic or least toxic.
- ✓ Increase public participation. Be democratic. Make sure that workers, consumers, and environmentalists are in all conversations and decisions about how to deal with chemicals and products.

Barry Commoner had it right with the "Four laws of ecology"

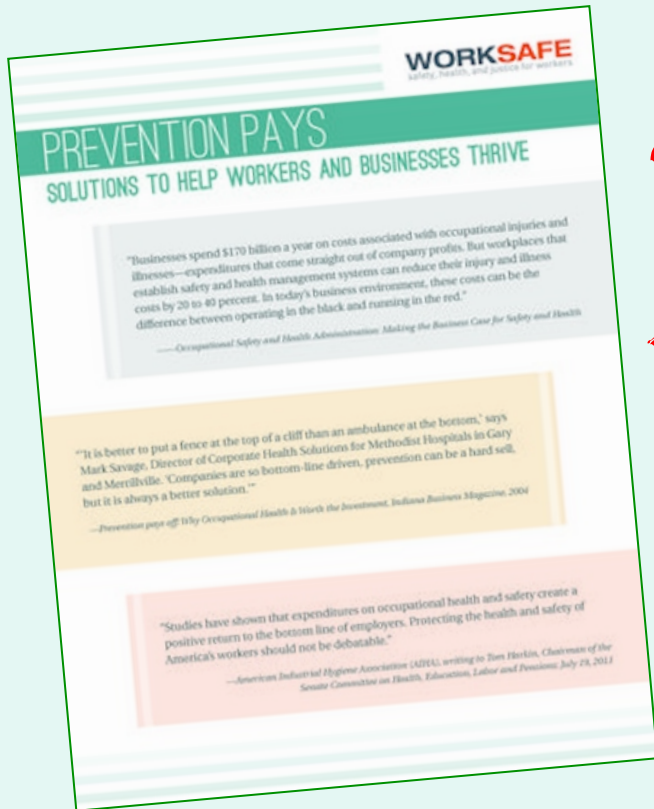
Promoting integrated views of the world, one of Barry Commoner's important contributions comes from *The Closing Circle* (1971). It is the notion that corporations, government, and consumers need to be in sync with the "Four laws of ecology":

- ✓ Everything is connected to everything else.
- ✓ Everything must go somewhere.
- ✓ Nature knows best.
- ✓ There is no such thing as a free lunch.



Barry Commoner, 1917 – 2012)

Let's move from problems to solutions, with prevention as our goal



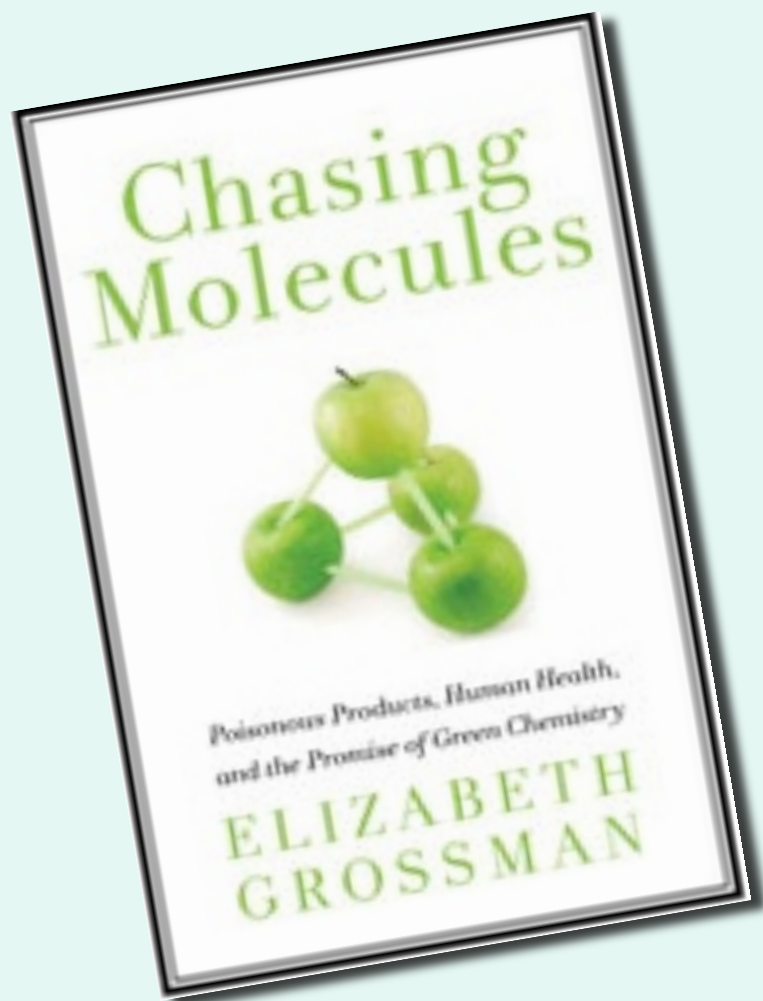
It is better to put a fence at the top of a cliff than an ambulance at the bottom. Companies are so bottom-line driven, prevention can be a hard sell, but it is always a better solution.

Director of Corporate Health Solutions for a Gary, Indiana hospital, Indiana Business Magazine, 2004; quoted in *Prevention Pays*, 2011)

It's time to shift from a focus on "the problem" and how bad it is, to a prevention framework that emphasizes solutions and "fixing" problems. It's time to make the goal clearer by using the word "prevention" instead of "controls." It's time to use the word "health" along with "safety." It's time to make the rewards of prevention more consistent, wide-ranging, and initiated by more employers and workers.

Worksafe, *Prevention Pays*, 2011

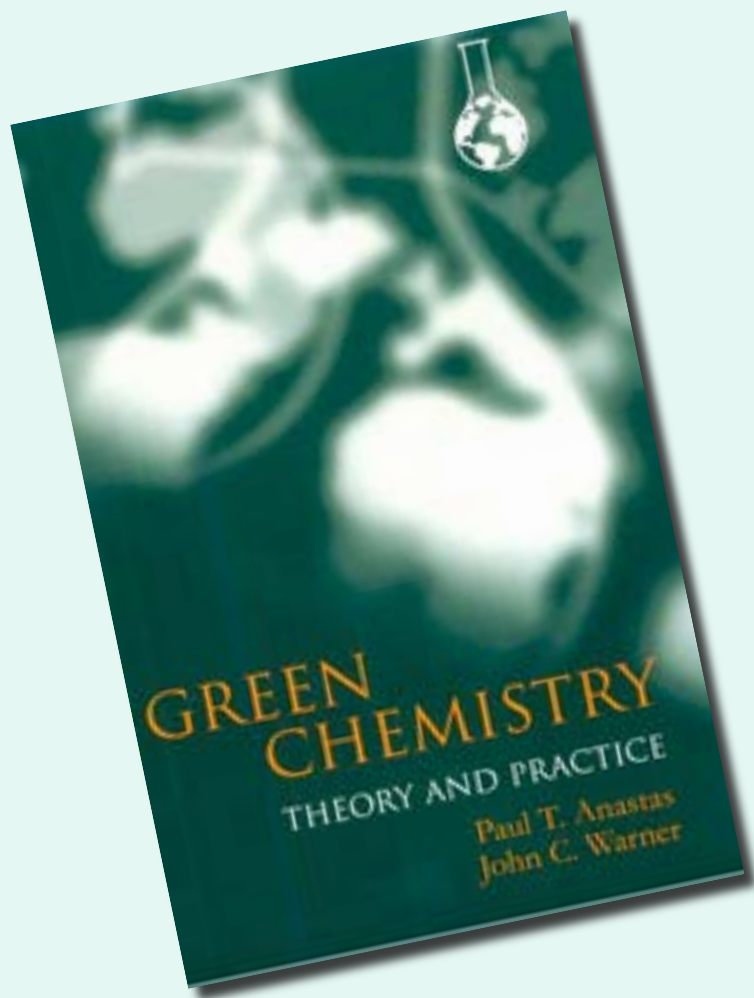
It's the hazards, stupid!



Prevention requires focussing on the chemical's hazard, not the risk it will harm (so why talk of “risk factors”?).

It's not about “safe” exposure levels or “controlling” the hazard.

Green chemistry is ...



- ✓ asking “Is this chemical/product necessary for this task?”
- ✓ about prevention -- using the precautionary approach
- ✓ better recipes -- designing safer chemicals, products and processes for healthier people, communities and environments
- ✓ not having to say you’re sorry (or making it less likely)



*Green chemistry is the **design** of chemical products and processes that reduce or eliminate the **use and/or generation** of hazardous substances.*

John Warner,
Warner Babcock Institute for Green Chemistry
Green chemistry: The missing element in chemistry education, presented October 15, 2014 in the Green Chemistry Webinar series.

Green chemistry ...

.. is a framework for the design of products and processes such that the goals themselves, e.g. degradability or less toxic products, are essential performance criteria.

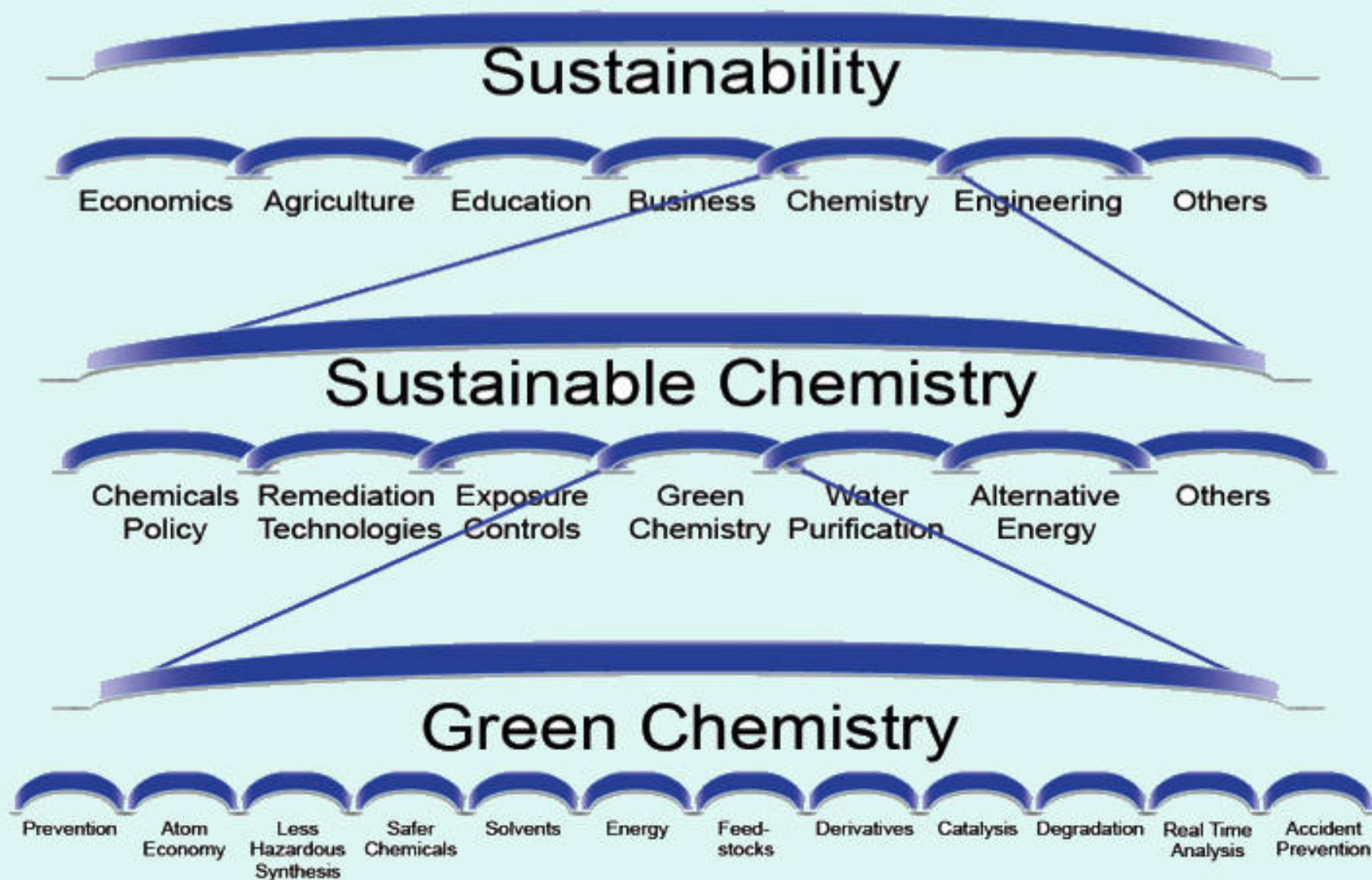
*It will be important that these goals are intrinsic design specifications. In that way, it will be obvious that **when a hazardous and unsustainable product or process is produced, there are only two explanations: (1) there is a design flaw or (2) it was designed to be hazardous.***



Paul Anastas

Paul Anastas and Evan Beach, "Green chemistry: the emergence of a transformative framework", Green Chemistry Letters and Reviews, March, 2007.

Green chemistry is part of sustainability



From: John Warner, Warner Babcock Institute for Green Chemistry
Green chemistry: The missing element in chemistry education,
presented October 15, 2014 in the Green Chemistry Webinar series.

Green chemistry is important to workplaces and workers

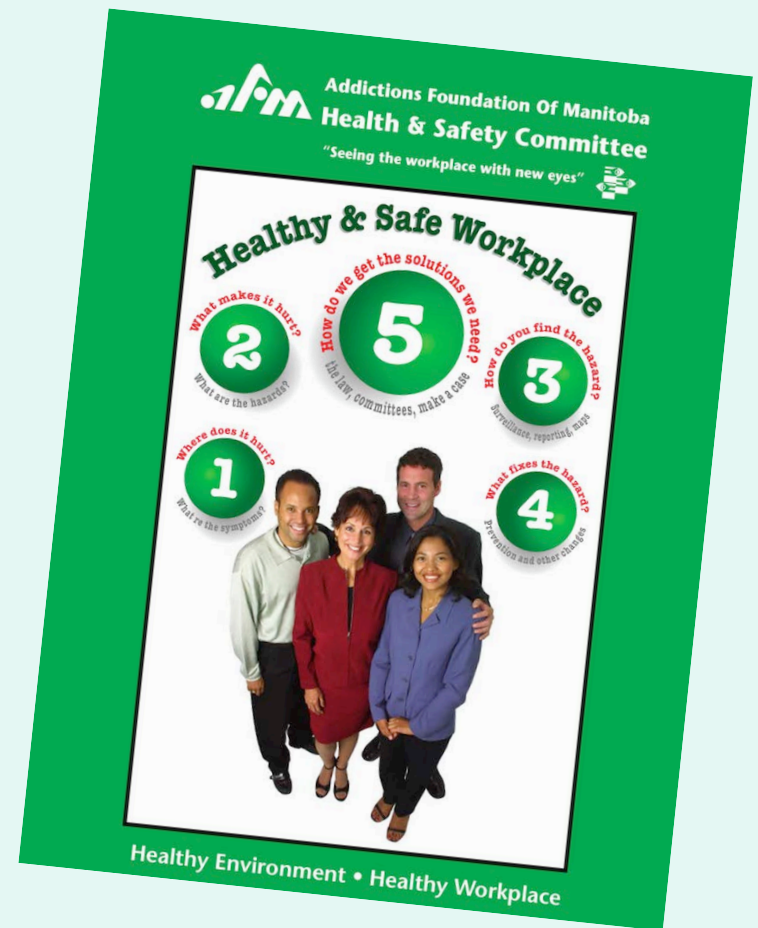


- ✓ addresses the unique effects of toxic chemicals on workers' health
- ✓ *prevents workplaces from contaminating the environment and communities*
- ✓ promotes integrated strategies to protect workers, communities, and the environment
- ✓ *builds on safer/healthier chemical alternatives already out there*

Based on Julia Quint's presentation at a California Green Chemistry Initiative workshop, 2010

Benefits of green chemistry

- ✓ healthier workplaces and communities
- ✓ *links healthy workplaces to a healthy environment*
- ✓ economical
- ✓ *less waste*
- ✓ fewer “accidents”
- ✓ *safer/healthier products*
- ✓ lowers cost of production and regulation
- ✓ *competitive advantage*



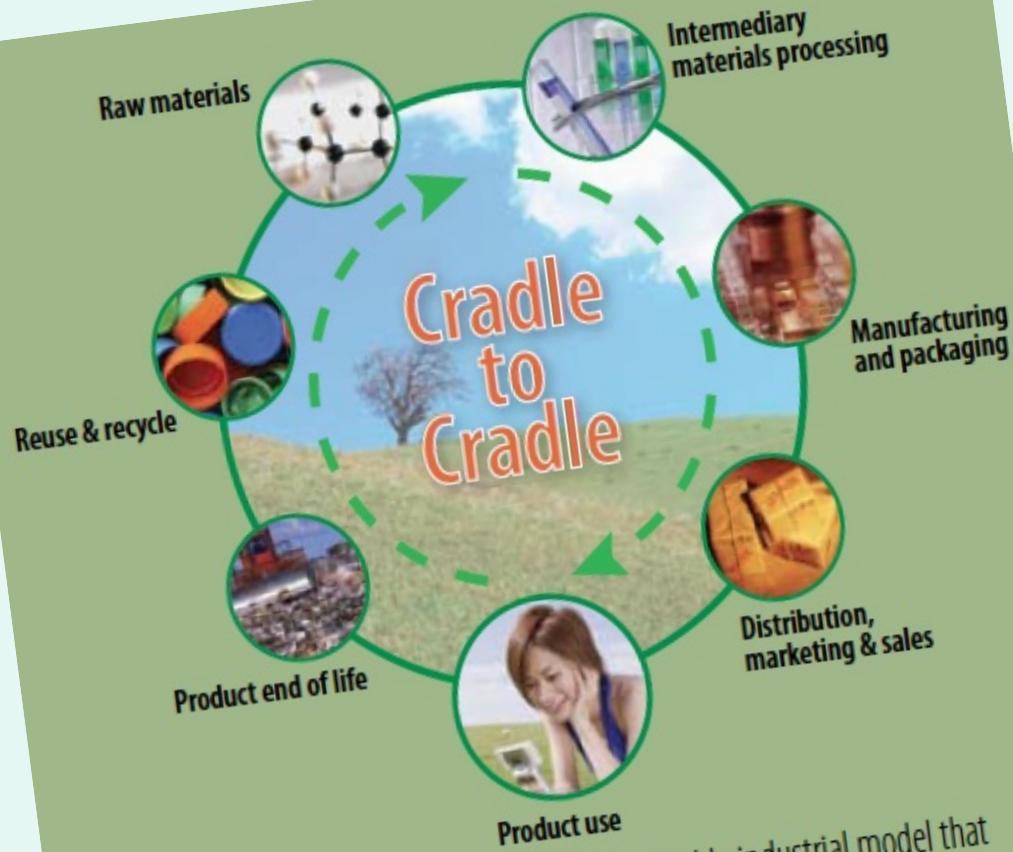
Green chemistry can link occupational and environmental health

Linkages between occupational and environmental health:

- essential to prevent unintended consequences
- *circumvent inadequacies of worker OHS regulations*
- supported by government agencies (in California)
- *shortage of on-going, institutional, inter-disciplinary mechanisms to leverage the benefits*



Linking environmental regulations to the prevention of chronic health damage among lithographic printers, presented by Patrice Sutton, Katy Wolf & Julia Quint, APHA, 2007



Cradle-to-Cradle is an innovative and sustainable industrial model that focuses on design of products and a production cycle that strives to produce no waste or pollutants at all stages of the lifecycle.

Braungart and McDonough
Cradle-to-Cradle: Remaking the Way We Make Things (2002)

It takes us to different ways of thinking about the design of materials and products and the chemicals that go into them

For more, check out the Story of Stuff



<https://itunes.apple.com/ca/podcast/good-stuff-episode-12-green/id506549857?i=312916738&mt=2>

If it's on the store shelf, it's been tested and found safe, right? Guess again. Bev Thorpe of Clean Production Action talks about the hidden chemical dangers in everyday products and how 'green chemistry'—designing materials and products without harmful chemicals—promises to transform the relationship between us and our Stuff. (May 14, 2014)

Especially the original "story" at <http://storyofstuff.org/movies/story-of-stuff/>

OSHA recognizes the need to go beyond PELs to designing chemicals differently



We know that the most efficient and effective way to protect workers from hazardous chemicals is by eliminating or replacing those chemicals with safer alternatives whenever possible.

David Michaels in US Department of Labor (2012) OSHA releases new resources to better protect workers from hazardous chemicals, OSHA Statement: 13-2026-NAT, available at

https://www.osha.gov/pls/oshaweb/owadisp.show_document?

https://www.osha.gov/dsg/safer_chemicals/

Informed substitution is key

*Informed substitution, a term coined at the US EPA, is the considered **transition from a chemical of particular concern to a safer chemical or non-chemical alternative.***

*Informed substitution builds on the best available information **and leads to cleaner production** and the development or use of less hazardous chemical and non-chemical technologies. It also **minimizes the opportunity for unintended consequences.** Informed substitution is a principle that underlies effective **alternatives assessment.***



California has a Green Chemistry Initiative - and regulation

1. Expand pollution prevention
2. Develop green chemistry capacity
3. Create an on-line product ingredient network
4. Create an on-line toxics clearinghouse (SB 509)
5. Accelerate the quest for safer products (AB 1879)
6. Move toward a cradle-to-cradle economy



Safer Consumer Products Regulation

The screenshot shows the DTSC website with the following elements:

- Header:** CA.GOV logo, California Department of Toxic Substances Control, navigation links (About DTSC, Jobs & Exams, Calendar, E-Lists, Contact), and a search bar.
- Navigation Bar:** HOME, RESTORING COMMUNITIES, SAFEGUARDING COMMUNITIES, PROTECTING FUTURE GENERATIONS.
- Main Content Area:**
 - SAFER CONSUMER PRODUCTS (SCP):** A large heading with a colorful diamond graphic.
 - GO Submit questions/feedback on the SCP Program:** A green button.
 - Safer Consumer Products:** A section with a green arrow icon.
 - SAFER CONSUMER PRODUCTS REGULATIONS:**
 - The Safer Consumer Products program strives to reduce toxic chemicals in products consumers buy and use. It identifies specific products containing potentially harmful chemicals and asks manufacturers to answer two questions: 1) Is this chemical necessary? 2) Is there a safer alternative?**
 - The program requires manufacturers to conduct a thorough analysis of alternatives to make sure they don't pose environmental or health problems. The result is that consumers will confidence that the products they buy are safe for their families and the environment.**
 - Program Overview**
 - PRIORITY PRODUCT WORK PLAN:**
 - DTSC is developing a Priority Product Work Plan which identifies product categories from which Priority Products will be selected over the next three years. DTSC invites you to participate in our workshops to discuss the draft Priority Product Work Plan. Workshops will be held on September 25, 2014 at the CalEPA Headquarters in Sacramento, and on September 29, 2014 at DTSC's regional office in Cypress. For workshop details and registration, please see our workshops web page. The draft Work Plan is available for public comment using our California Safer Products Information Management System (CalSAFER) until 5 p.m. (PDT) on October 21, 2014.**
 - PRIORITY PRODUCTS:**
 - What is a Priority Product? A Priority Product is a consumer product that contains one or more chemicals – known as Candidate Chemicals – that have a hazard trait that can harm people or the environment. A proposed list of three product-chemical combinations was released on March 13, 2014. This initial Priority Product list is the first of several product-chemical combinations that will be released by DTSC.**
- Left Sidebar:**
 - GO Submit questions/feedback on the SCP Program:** A green button.
 - Navigation Links:** SCP Home, News Coverage, Workshops, SCP Program Overview, Priority Products, Chemical Lists, Alternatives Analysis, Toxics Information Clearinghouse, Green Ribbon Science Panel, Petitions.
 - Image:** A photo of Matt Rodriguez, Secretary for Environmental Protection, speaking at a podium.
 - Caption:** Statement by Matt Rodriguez, Secretary for Environmental Protection.
 - Quick Links:** A section with a green arrow icon.

CHANGE
Californians for a Healthy & Green Economy

WORKSAFE
safety, health, and justice for workers
seguridad, salud, y justicia para los trabajadores



For too long, manufacturers have put toxic chemicals in everyday products, with no accountability for their hazards to people or the environment.

For too long, workers, low income communities and communities of color have been forced to bear an unequal burden of chemical exposure.

For too long, the public has been asked to suffer through increasing rates of disease and environmental degradation.

And for too long, we've been forced to live with the fact that all of us are carrying a cocktail of toxic and untested chemicals in our bodies knowing that the federal government is powerless to act due to weak and outdated chemical laws.

*This program's approach is very different from the way that chemicals are currently regulated. **Instead of debating over how much of a toxic chemical is safe, this program will instead require that manufacturers look for safer alternatives.***



DTSC'S Initial Proposed Priority Products List for the Safer Consumer Products Program

March 13, 2014

Under the Department of Toxic Substances Control's (DTSC) Safer Consumer Products regulations, DTSC must publish an initial proposed Priority Products list by March 28, 2014. This draft list imposes no new regulatory requirements on product manufacturers until DTSC finalizes it by adopting regulations and includes the following Priority Products:

- Paint and Varnish Strippers, and Surface Cleaners containing Methylene Chloride
- Spray Polyurethane Foam Systems containing Unreacted Diisocyanates
- Children's Foam-padded Sleeping Products containing TDCPP

Table 4 Potential Candidate Chemicals in Cleaning Products

Chemicals or Chemical Classes	Functional Use
Alkyl phenol ethoxylates (APEs)	Surfactant
Hydrogen Fluoride	Anti-scaling agent
Phthalates	Emulsifier
Triclosan	Antimicrobial
Volatile Organic Compounds, such as n-hexane, methyl ethyl ketone, n-methyl-pyrrolidone, toluene, and xylene	Solvent

Worksafe's
advocacy paid
off: workers are
a priority even
though it's
about
"consumer
products"

Workers matter, in California's green chemistry regulation

(6) "Adverse public health impacts" means any of the toxicological effects on public health specified in articles 2 or 3 of chapter 54, or exceedance of an enforceable California or federal regulatory standard relating to the protection of public health. Public health includes **occupational health**.

"Sensitive subpopulations" also include persons at greater risk of adverse health effects when exposed to chemicals, because they are either individuals with a history of serious illness or greater exposures or **workers** with greater exposures due to the nature of their occupation.

4. Public and/or aquatic, avian, or terrestrial animal or plant organism exposures to the Chemical(s) of Concern in the product during the product's **life cycle**, considering:

a. Manufacturing, use, storage, transportation, waste, and end-of-life management

practices and the locations of these practices;

b. The types of uses that would contribute to or result in public exposure to the Chemical(s) of Concern in the product, considering:

i. Household and recreational use;

ii. **Sensitive subpopulation** use of, or exposure to, the product at locations frequented by members of sensitive subpopulations; and

iii. **Workers**, customers, clients, and members of the general public who use, or otherwise come in contact with, the product or releases from the product in the home, workplace, or other locations;

Steps in California's green chemistry (SCP) regulations -- and they include workers

The Four-Step Framework for the SCP Regulations

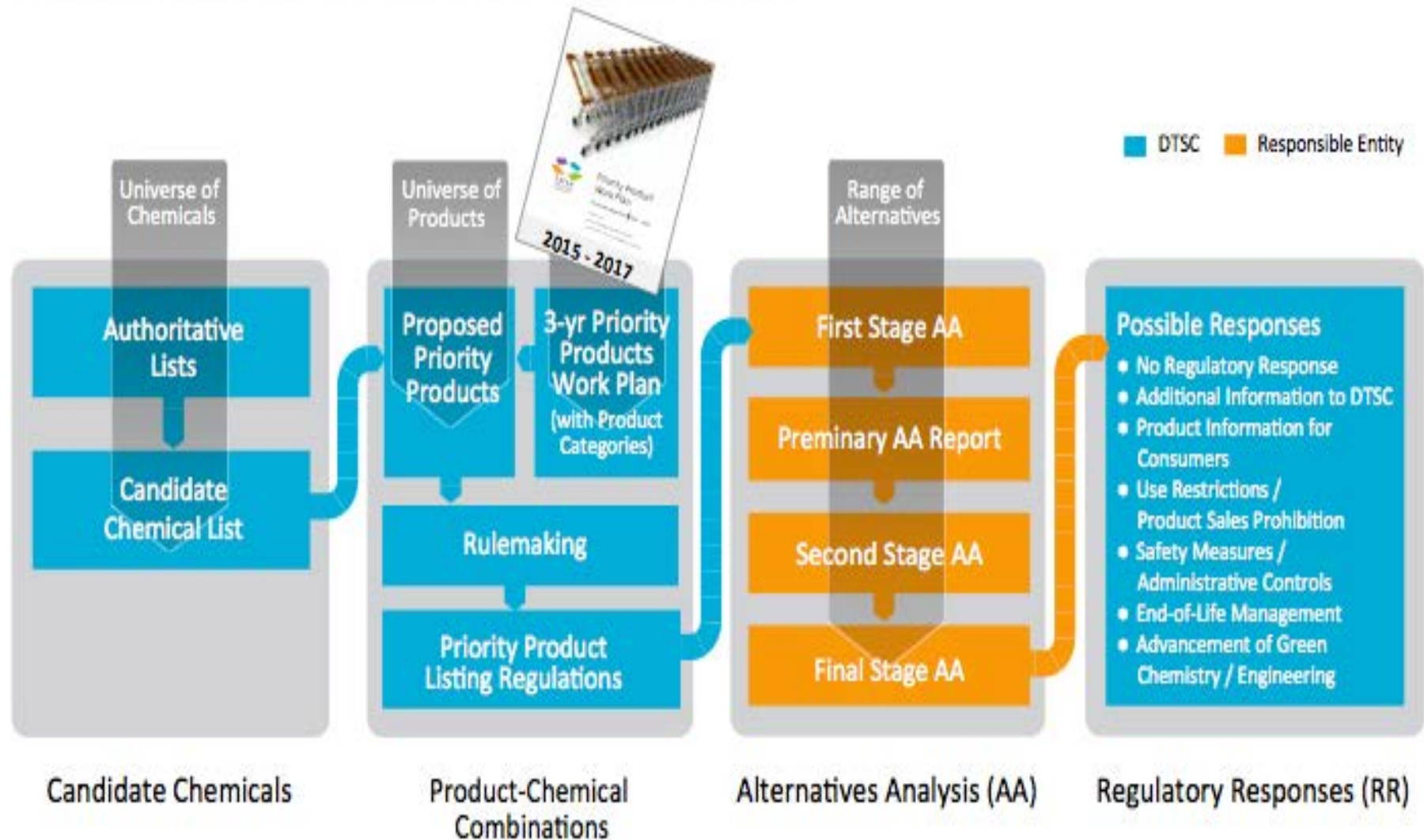


Table 8 Product Categories and Examples

Beauty/Personal Care/Hygiene	Cleaning Products
Skin Products Personal Hygiene Products Hair Products Cosmetics and Fragrances	Fresheners and Deodorizers Cleaners Laundry Surface Care
Building Products: Painting Products, Adhesives, Sealants and Flooring	Clothing
Adhesives and Glues Carpeting and Carpet Padding Engineered Wood and Laminate Flooring Paints and Primers Paint and Graffiti Removers Roof Coatings Sealants Vinyl Flooring	Full Body Wear Lower Body Wear and Bottoms Sleepwear Sportswear Underwear Upper Body Wear and Tops
Household/Office Furniture/Furnishings with PFCs, FRs	Fishing and Angling Equipment
Bedding Curtains Fabric and Textile Furnishings Household and Office Seating	Fishing weights
	Office Machinery Consumable Products
	Inks and Toners Thermal Paper

*Possible priority products
in next three years*

What else? Use the new GHS/Haz Comm pictograms

The hazard symbols, (e.g., the exploding chest, dead tree and fish) can become indicators to start looking for less toxic products or a different way to do the task.



- respiratory or skin sensitization: respiratory sensitizer (Categories 1, 1A, 1B)
- germ cell mutagenicity (Categories 1, 1A, 1B, 2)
- carcinogenicity (Categories 1, 1A, 1B, 2)
- reproductive toxicity (Categories 1, 1A, 1B, 2)
- specific target organ toxicity: one exposure (Categories 1, 2)
- specific target organ toxicity: repeated exposures (Categories 1, 2)
- aspiration (Category 1)



affects aquatic life

And then ...

Screen ingredients using
GHS classifications, Pharos,
ChemHAT, Risctox



[European Chemicals Agency \(ECHA\) Classification and Labelling \(C&L\) Inventory](#)



GreenScreen™ for Safer Chemicals v 1.2 Benchmarks

Start at Benchmark 1 (red) and progress to Benchmark 4 (green)



ABBREVIATIONS

- P** Persistence
B Bioaccumulation
T Human Toxicity and Ecotoxicity

This chemical passes all of the criteria.

BENCHMARK 4

Low P* + Low B + Low T (Ecotoxicity, Group I, II and II* Human) + Low Physical Hazards (Flammability and Reactivity) + Low (additional ecotoxicity endpoints when available)

Prefer—Safer Chemical



If this chemical and its breakdown products pass all of these criteria, then move on to Benchmark 4.

BENCHMARK 3

- Moderate P or Moderate B
- Moderate Ecotoxicity
- Moderate T (Group II or II* Human)
- Moderate Flammability or Moderate Reactivity



Use but Still Opportunity for Improvement

BENCHMARK 2

- Moderate P + Moderate B + Moderate T (Ecotoxicity or Group I, II, or II* Human)
- High P + High B
- High P + Moderate T (Ecotoxicity or Group I, II, or II* Human)
- High B + Moderate T (Ecotoxicity or Group I, II, or II* Human)
- Moderate T (Group I Human)
- Very High T (Ecotoxicity or Group II Human) or High T (Group II* Human)
- High Flammability or High Reactivity



If this chemical and its breakdown products pass all of these criteria, then move on to Benchmark 3.

Use but Search for Safer Substitutes

BENCHMARK 1

- PBT = High P + High B + [very High T (Ecotoxicity or Group II Human) or High T (Group I or II* Human)]
- vPvB = very High P + very High B
- vPT = very High P + [very High T (Ecotoxicity or Group II Human) or High T (Group I or II* Human)]
- vBT = very High B + [very High T (Ecotoxicity or Group II Human) or High T (Group I or II* Human)]
- High T (Group I Human)



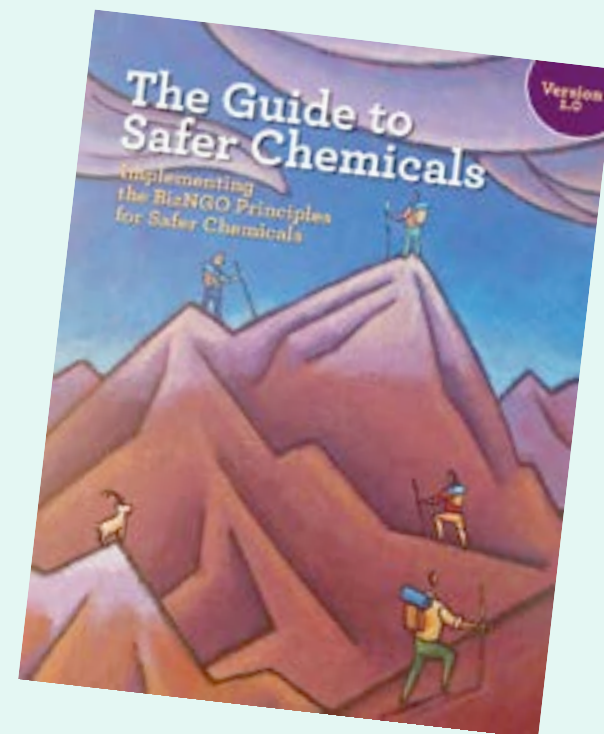
If this chemical and its breakdown products pass all of these criteria, then move on to Benchmark 2.

Avoid—Chemical of High Concern

BENCHMARK U

- Unspecified Due to Insufficient Data

The Green Screen is behind Pharos and ChemHAT



<http://www.bizngo.org/safer-chemicals/guide-to-safer-chemicals>

Group I Human includes Carcinogenicity, Mutagenicity/Genotoxicity, Reproductive Toxicity, Developmental Toxicity (incl. Developmental Neurotoxicity), and Endocrine Activity. **Group II Human** includes Acute Mammalian Toxicity, Systemic Toxicity/Organ Effects-Single Exposure, Neurotoxicity-Single Exposure, Eye Irritation and Skin Irritation. **Group II* Human** includes Systemic Toxicity/Organ Effects-Repeated Exposure, Neurotoxicity-Repeated Exposure, Respiratory Sensitization, and Skin Sensitization. Immune System Effects are included in Systemic Toxicity/Organ Effects. **Ecotoxicity** includes Acute Aquatic Toxicity and Chronic Aquatic Toxicity.

Note: The level of hazard indicated is the lowest hazard level at which a chemical would fail that criterion. However, if the chemical has a higher hazard level than what is listed (e.g. chemical is very High and the criterion is High), it would also fail that criterion.

* For inorganic chemicals with Low B, Low T (Ecotoxicity, Group I, II and II* Human) and Low Physical Hazards (Flammability and Reactivity), persistence alone will not be deemed problematic. Inorganic chemicals that are only persistent may achieve Benchmark 4.



BizNGO.ORG
FOR SAFER CHEMICALS AND SUSTAINABLE MATERIALS

The Business-NGO Working Group promotes the creation and adoption of safer chemicals and sustainable materials in a way that supports market transitions to a healthy economy, healthy environment, and healthy people.



Principles for Sustainable Plastics

Plastics provide benefits to people across the globe. Lightweight, durable, flexible and easy to form, their use continues to grow rapidly. Cell phones, baby car seats, blood bags, backpacks, chairs, cars and clothing are among the many products made with plastics and reflect their beneficial properties. Yet plastic litter, gyres of plastics in the oceans and toxic phthalates in plastic products are raising public awareness, consumer demand, retail pressure and regulations for a more sustainable material.

Businesses, hospitals and individuals are increasingly seeking plastics that are more sustainable across their life cycle: from raw material extraction and production to manufacturing to use and end-of-life management. They want to use plastics that are made from sustainable raw materials, if it contains chemicals of high

4. Safer Chemicals

A plastic should be manufactured using inherently safer chemicals and processes. The byproducts and waste streams from manufacturing along with the degradation and transformation products from use and end-of-life management should be inherently safer and in balance with natural systems.⁴

5. Healthy Workplaces & Communities

Industry practices at each stage in the life cycle of a plastic, from the growing or extracting of feedstocks to the manufacturing of a plastic and its end-of-life management should be healthy for workers, local communities and the environment.

It is important to note that the evaluation and selection of plastics will vary over time as the infrastructure and technology evolve for developing new materials and capturing and reusing existing materials at end of life.



Ecolabels can help

- [*Ecologo*](#)
- [*Green Seal US*](#)
- [*EPA's Design for Environment/DfE Safer Choices*](#) (sometimes)



You still need to check their criteria, especially for asthmagens, CMRs, endocrine disruptors, and whether they've actually been tested

Examples of green chemistry at work -- at work



- ✓ nail salon workers
- ✓ dry cleaning (wet cleaning, not perc)
- ✓ plastics
- ✓ cleaning products without asthmagens, carcinogens, mutagens, etc. – and without chemicals (microfibre cloths/ mops)



- ✓ adhesives (e.g., UF-based one with soy-based one)



- ✓ methylene chloride paint strippers
- ✓ graffiti removers (Katy Wolf, IATA)
- ✓ floor strippers
- ✓ printing solvents

If we really want
"green jobs" - ones
that are good for
people doing the
work, and the
environment -- we
need to ask:

- *Is it necessary? and*
- *What about the workers?*



Other sources of information

Informed substitution

Chemical screening/information

- CAREX Canada (about cancer) (www.carexcanada.ca/)
- ChemHAT (www.chemhat.org)
- Environmental Working Group' Skin Deep (www.ewg.org/skindeep)
- GHS categories (e.g., <http://echa.europa.eu/regulations/clp/cl-inventory>)
- Green Screen (www.greenscreenchemicals.org)
- New Jersey chemical information sheets (<http://web.doh.state.nj.us/rtkhsfs/rtkhsl.aspx>)
- Pharos database, Healthy Building Network (www.healthybuilding.net)
- RISCTOX (www.istas.net/risctox/en/)
- Substitute It Now (SIN) list (www.chemsec.org)
- Clean Production Action and BizNGO (www.cleanproduction.org)
- Healthy Building Network (www.healthybuilding.net)
- Informed solutions (for cleaning products) (www.informedsolutions.org)
- Institute for Research and Technical Assistance (Katy Wolf) (www.irta.us)
- Lowell Center for Sustainable Production (<http://sustainableproduction.org/>)
- Responsible Purchasing Network (www.responsiblepurchasing.org)
- Safer consumer products program (California) (<http://www.ewg.org/skindeep/>)
- San Francisco Department of Environment (www.sfapproved.org)
- Story of Stuff (www.storyofstuff.org)
- Transitioning to safer chemicals (OSHA) (www.osha.gov/dsg/safer_chemicals/)
- TURI CleanerSolutions database (www.cleansolutions.org)
- Warner Babcock Institute for Green Chemistry (<http://www.warnerbabcock.com>)



***Our health is not
(supposed to be)
for sale***



*The men learned that
their health belonged to
them -- they were leasing
their labour but not their
health.*



Emilien Clouthier, CSN strike leader,
1974; from “Our health is not for sale”,
National Film Board, 1978

My friends, Love is
better than anger. Hope
is better than fear.
Optimism is better than
despair. So let us be
loving, hopeful and
optimistic. And we'll
change the world.



A message to Canadians from Jack Layton,
Leader of the federal New Democratic Party
August 20, 2011
(two days before his death from cancer at 61)

Think big.

Think solutions.

Think tools.

Think collective
action.

Think justice.

(and a whole
lot more)



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