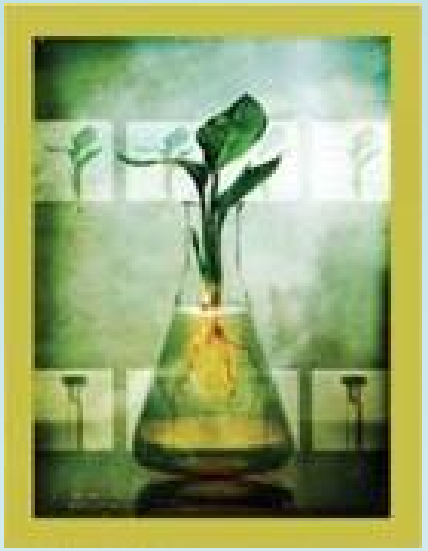
Opportunities for Green Chemistry, Green Jobs and a Sustainable Economy



Green Chemistry & Commerce Council

May, 2009

David Levine

Green Harvest Technologies

American Sustainable Business Council

Investing in America's Future

Barack Obama and Joe Biden's Plan for Science and Innovation

- Restoring integrity to U.S. science policy.
- Doubling over a 10 year period the federal investment in basic research
- Making a national commitment to science education and training
- Encouraging American innovation to flourish
- Addressing the grand challenges of the 21st century

Engaging Green Chemists

Environmental Health Fund & Lowell Center for Sustainable Production

- Center for Green Chemistry and Green Engineering, Yale, Paul Anastas
- Univ. of California, Michael Wilson
- Warner Babcock Institute, John Warner
- The Institute for Green Science, Carnegie Melon, Terry Collins

Sustainable Bioplastic Guidelines

www.sustainablebiomaterials.org

As You Sow | Center for Health, Environment and Justice | Clean Production Action* | Environmental Health Fund* | Green Harvest Technologies | Health Care Without Harm Healthy Building Network* | Institute for Agriculture and Trade Policy | Institute for Local Self-Reliance* | Lowell Center for Sustainable Production* | Sustainable Research Group | Pure Strategies | RecycleWorld Consulting | Science & Environmental Health Network | Seventh Generation | National Campaign for Sustainable Agriculture

* Steering committee

Policies to Promote Green Chemistry and Engineering and Sustainable Materials for a Stronger and Safer Economy

- Support Green Chemistry Research and Development Act
- Establish regional green chemistry and engineering centers
- Promote and Fund a Chemical Hazard Database for Green Chemistry
- Aid Colleges and Universities in Establishing Green Chemistry and Engineering Educational Programs
- Develop and Support Green Jobs Initiatives
- Promote Biobased Materials Development in Agriculture Policy
- Promote Materials Recycling to Reduce Waste.

Call for an Equitable and Sustainable Economy

We hold a shared point of view about the positive role that business should play in our society, the proper role of government in structuring the market, and the way public resources are invested. We believe that not only is sustainable economic development compatible with shared prosperity, environmental protection and regeneration, and social justice – it is essential from both a moral and pragmatic standpoint that we restructure our economy to achieve this balance.

Food, Water and Product Safety

We encourage you to support public policies and industry standards that know and disclose product chemistry; assess and avoid hazards; and commit to continuous improvement, also supporting research and development for green chemistry and engineering solutions.

Guiding Principles for Chemicals Policy

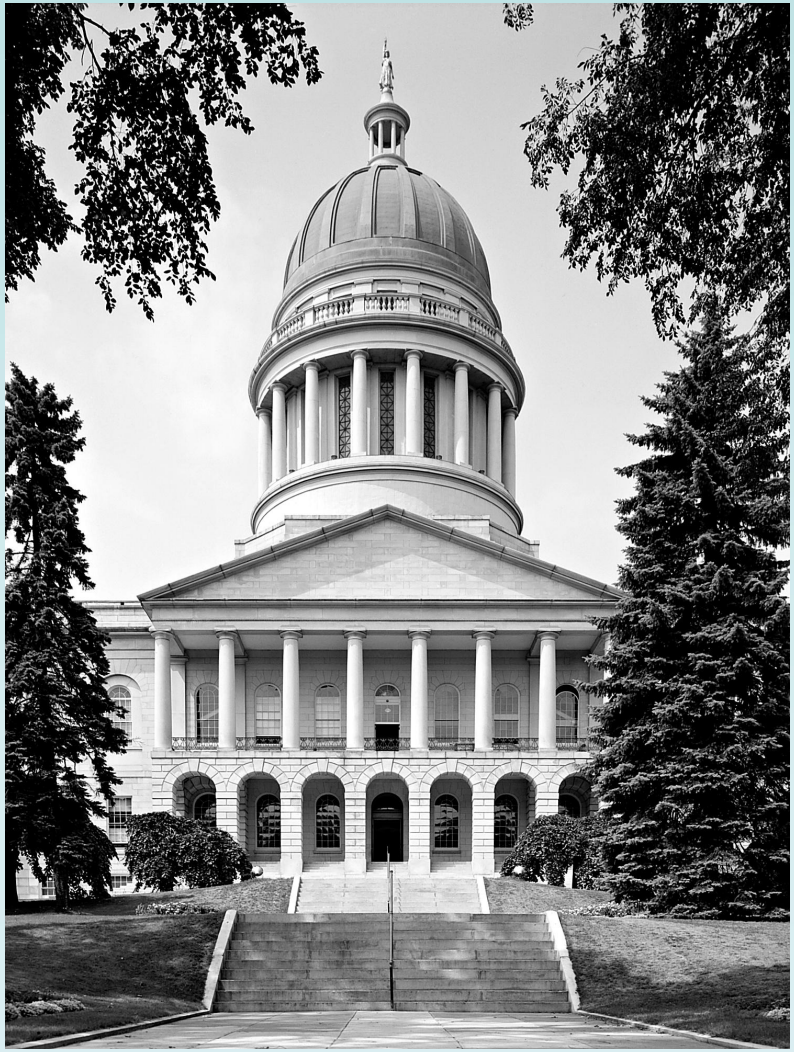
1. Know and disclose product chemistry

2. Assess and avoid hazards

3. Commit to continuous improvement

4. Support public policies and industry standards

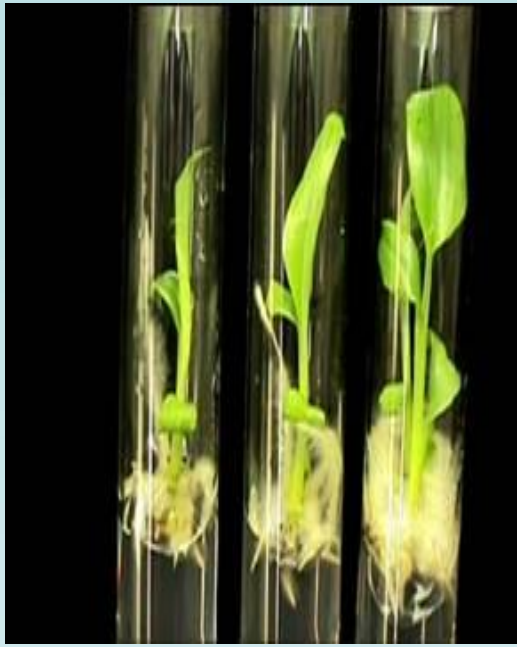
4. Support Public Policies and Industry Standards that …



- advance the implementation of the above three principles,
- ensure that **comprehensive hazard data** are available for chemicals on the market,
- take action to **eliminate or reduce known hazards** and
- promote a greener economy, including support for **green chemistry research and education**.

Green Chemistry Research & Development Act

- about $55 million a year to green chemistry researchers
- NSF and EPA would lead an Interagency Working Group
- Supports individual investigators, university-industry partnerships, and green chemistry R&D at Federal labs
- promote education through curricula development and fellowships
- help improve commercialization of green chemistry technologies
- collect and disseminate information about green chemistry.



Safer Alternatives, Green Chemistry and Engineering Recommendations for Kids-Safe Chemicals Act

- Establish a program to create market incentives for the development of safer alternatives as defined by green chemistry principles
- Establish a network of not less than 4 green chemistry and engineering centers
- Conduct interdisciplinary green chemistry and green technology research and alternatives assessment
- Provide technical training, create educational materials and promote outreach efforts and provide technical assistance
- Provide funding to support R & D work

Additional Bills

Ban Poisonous Additives Act

Ban BPA from all food and beverage containers

Safe Cosmetics Act

More strictly regulate the cosmetics industry

Chemical Facility Anti-Terrorism Act

Require facilities that use extremely hazardous substances to systematically seek alternatives

Environmental Justice Act

provides leverage to advance environmental justice throughout the government

State Efforts

BPA bill

Connecticut, Suffolk County, NY

MN, CA and NY & others considering bills

Other examples

Safe Children's Products - Michigan

The Safer Alternatives Bill - Massachusetts

Stimulus Package

- $11 billion for smart-grid related activities, including work to modernize the electric grid.
- $4.5 billion for repair of federal buildings to increase energy efficiency using green technology.
- $6.3 billion for Energy Efficiency and Conservation Grants.
- $5 billion for the Weatherization Assistance Program.
- $2.5 billion for energy efficiency and renewable energy research.
- $2 billion in grant funding for the manufacturing of advanced batteries systems and components and vehicle batteries that are produced in the United States.
- $6 billion for new loan guarantees aimed at standard renewable projects such as wind or solar projects and for electricity transmission projects.
- $1 billion for energy efficiency programs including alternative fuel trucks and buses, transportation charging infrastructure, and smart and energy efficient appliances.
- $8.4 billion for investments in public transportation. .
- $9.3 billion for investments in rail transportation, including Amtrak, High Speed and Intercity Rail.
- $4 billion to the public housing capital fund to enable local public housing agencies to address a $32 billion backlog in capital needs -- especially those improving energy efficiency in
- $250 million is included for energy retrofitting and green investments in HUD-assisted housing projects.
- $6 billion is directed towards environmental cleanup of former weapon production and energy research sites. - $6 billion for local clean and drinking water infrastructure improvements.
- $1.2 billion for EPA's nationwide environmental cleanup programs, including Superfund.
- $1 billion for the Bureau of Reclamation to provide clean, reliable drinking water to rural areas and to ensure adequate water supply to western localities impacted by drought.
- $1.38 billion to support $3.8 billion in loans and grants for needed water and waste disposal facilities in rural areas.
- $2 billion total for Science at the Department of Energy including $400 million for the Advanced Research Projects Agency—Energy (ARPA-E).

Grants Available for Green Chemistry Research

- "Green chemistry and engineering for drug discovery, development and production" has been identified by the National Institute of General Medical Sciences (NIGMS) as one of the specific challenge topics for the National Institutes of Health's "NIH Challenge Grants in Health and Science Research."
- The NIH has designated at least $200 million for the new initiative-part of the American Recovery and Reinvestment Act (ARRA)-which will support research in selected topic areas. Award grants of up to $1 million each are available to help quickly advance the area in significant ways.

State Engagements

AMERICAN RECOVERY AND REINVESTMENT ACT: THE IMPACT FOR *Colorado*

In Colorado, this package will deliver immediate, tangible impacts, including: **Creating or saving 59,000 jobs over the next two years.**

Michigan Green Chemistry Program

The Michigan Green Chemistry Program was created by Executive Directive, No. 2006-6, which also established a Green Chemistry Roundtable within the State of Michigan. Its goal is to promote green chemistry for sustainable economic development and protection of public health.

California Green Chemistry Initiative

Green Jobs Policy

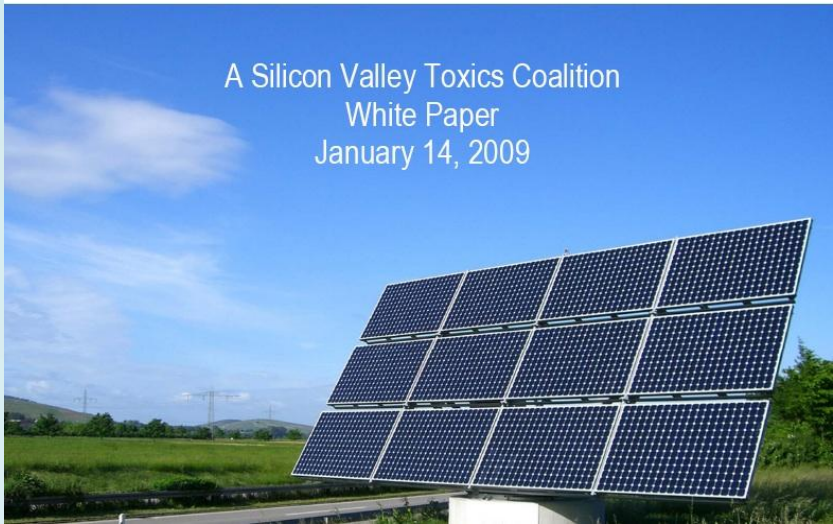
Of the 73 bills related to the solar PV industry that were introduced in the California Legislature during 2007 and 2008, none addressed the manufacturing or end-of-life hazards discussed in this report. Most of the bills focused on installation targets and tax incentives/rebates for photovoltaic adoption.

Recommendations for a Clean and Just Solar Industry

- Reduce and Eventually Eliminate the Use of Toxic Materials
- Hold the Solar PV Industry Accountable for the Lifecycle Impacts of Its Products
- Ensure Proper Testing of New and Emerging Materials and Processes
- Expand Recycling Technology and Design Products for Easy Recycling
- Promote High-Quality “Green Jobs” That Protect Worker Health and Safety and0 Provide a Living Wage
- Protect Community Health and Safety throughout the Global PV Industry and Supply Chains

Hazardous Materials Used in Solar PV Cell Production Crystalline Silicon (c-Si), Amorphous Silicon (a-Si) Thin Film, Cadmium Telluride (CdTe) Thin Film, Copper Indium Selenide (CIS) and Copper Indium Gallium Selenide (CIGS), Gallium Arsenide (GaAs) and Multijunction Cells

Toward a Just and Sustainable Solar Energy Industry



Retrofitting Issues

- **Vinyl windows**
- **Vinyl Flooring**
- **Foam insulation**
- **PVC**
- **Flame retardants**
- **Toxic adhesives**

NYS Weatherization Program proposed

The program should assess and avoid hazardous chemicals, materials and products that are hazardous in any stage of their lifecycle; and commit to seek to utilize the safest materials and products. If the lead agency determines that a safe alternative does not exist, it shall direct that research and development be initiated to create and bring to market the safer substances as guided by the Twelve Principles of Green Chemistry.

Renew Through Green Jobs Act of 2009

A sustainability workforce training and education program

(1) clean energy, including wind, solar, and geothermal energy;
(2) green construction, green retrofitting, and green design
(3) green chemistry
(4) water and energy conservation;
(5) recycling and waste reduction
(6) sustainable agriculture and farming;
(7) sustainable culinary practices;
(8) smart grid technology, design, and deployment;
(9) advanced vehicle technology, including plug-in electric drive vehicles; and
(10) electric power transmission systems, including upgrading and reconductoring

Opportunities for GC3 and its participants to drive Green Chemistry

- **Partnerships**
  - American Sustainable Business Council
  - Business – NGO Working Group
  - Green jobs efforts
- **Federal Policies**
  - Green Chemistry Research & Development Act
  - Kids Safe Chemicals Act
  - Ban Poisonous Additives Act
  - Safe Cosmetics Act
  - Chemical Facility Anti-Terrorism Act
  - Environmental Justice Act
- **State Policies** - Interstate clearinghouse
- **Engagement with Federal Agencies**
- **Green Jobs**
  - Stimulus
  - Green Jobs Act

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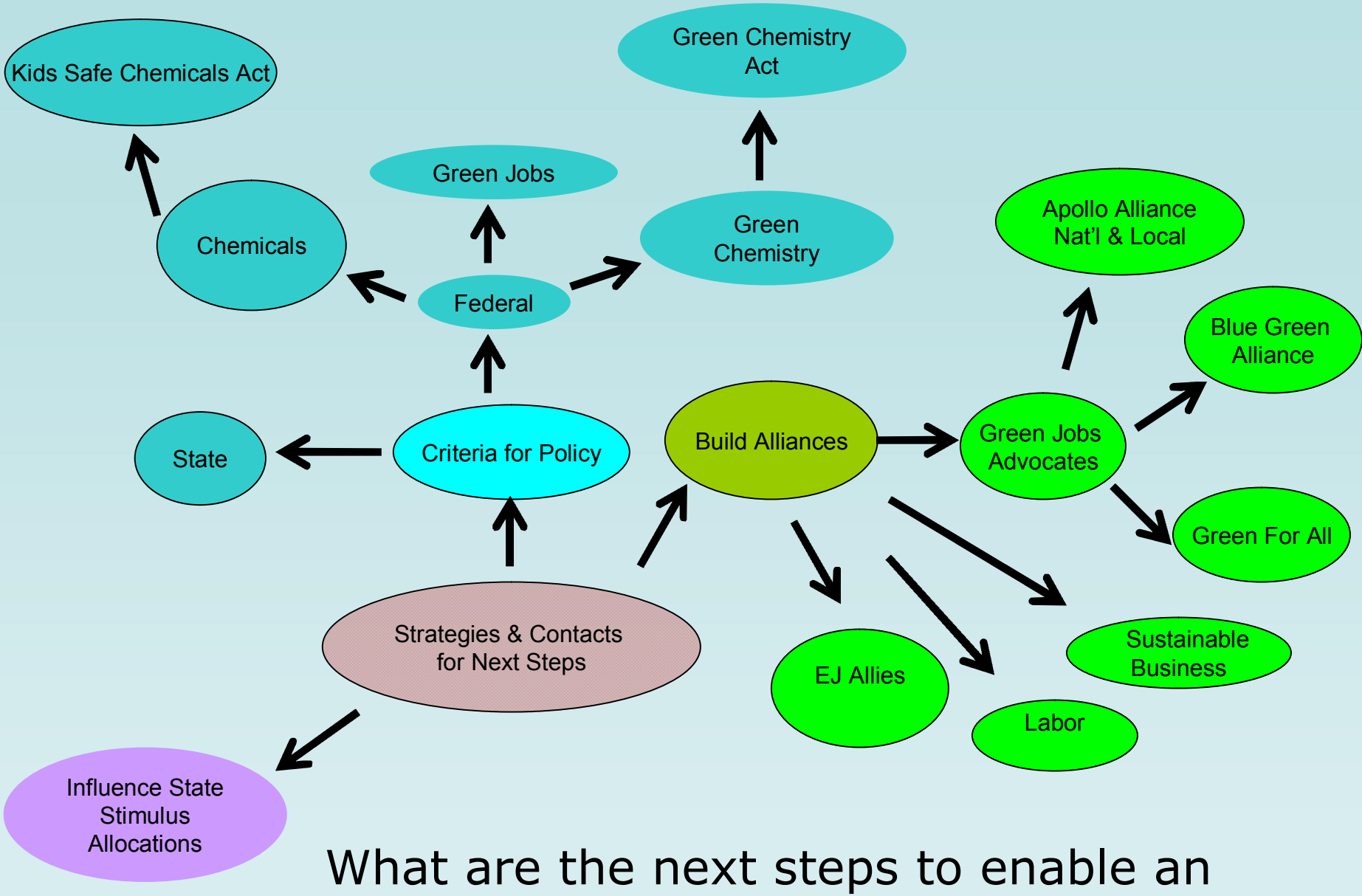
Resources

- http://grants.nih.gov/grants/guide/rfa-files/RFA-OD-09-003.html.
- **PLAN FOR SCIENCE AND INNOVATION** www.**barackobama**.com/pdf/issues/FactSheet**Science**.pdf
- **Business-NGO Working Group -- Guiding Principles** www.busngoworkgroup.org
- Michigan Green Chemistry

http://www.michigan.gov/deq/0,1607,7-135-3585_49005---,00.html

SAFER http://www.saferstates.com/



What are the next steps to enable an Green Chemistry and Engineering agenda for a sustainable economy?

Committee on International Science, Engineering and Technology

- **SCIENCE: Panel approves int'l research bill (04/30/2009)**
- Sara Goodman, E&E reporter
- The House Science Committee yesterday unanimously approved by voice vote a bill aimed at strengthening international cooperation for science and technology research.
- H.R. 1736, from Rep. Brian Baird (D-Wash.), would bring back a committee that was first created under former President Bill Clinton -- the Committee on International Science, Engineering and Technology (CISET) -- to develop inter-agency policies for establishing science and technology cooperation among countries. The panel was disbanded under President George W. Bush.
- Under the bill, the National Science and Technology Committee -- part of the White House Office of Science and Technology Policy -- would have jurisdiction over CISET, which would coordinate international science and technology partnerships between federal research agencies and the State Department.
- The last few years have seen an ad hoc approach to international coordination, and H.R. 1736 aims to streamline international collaboration.
- The committee also passed by voice vote H.R. 1709, which would establish a committee under the National Science and Technology Council to coordinate federal efforts to promote

Kids-Safe Chemicals Act

An effort to put reform of TSCA on the national agenda

Basic Principles

- shifting “the burden of proof” for chemical safety on to manufacturers
- establishing minimum information requirements for chemicals
- Go after the worst chemicals
- Easier access to information about chemicals and green chemistry alternatives
- identify and protect those most vulnerable to hazardous chemicals
- Drive innovation