

# Improving Chemicals Management in California



**Moving Forward Together  
Sacramento, CA  
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**Project Sponsor: University of California  
Office of the President**

## Overview



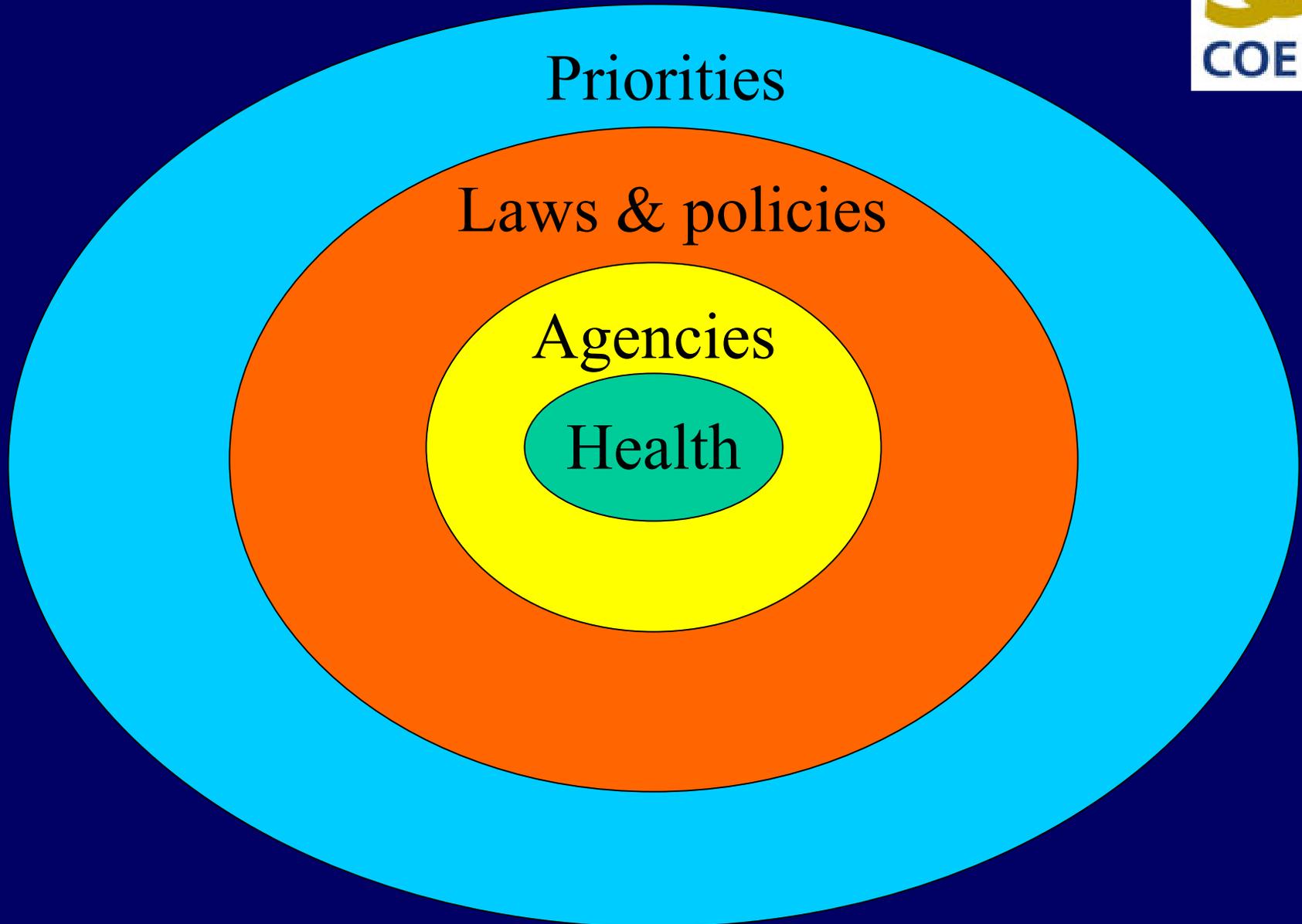
**TSCA: U.S. EPA burdened with high procedural & evidentiary requirements in gathering toxicity data from producers and in restricting chemicals of concern;**

**In California, there are inadequate State-level chemical demographic data. Together, these have resulted in**

- substantial gaps in chemical demographic, toxicity and exposure data**
- an inability to prioritize chemical hazards & risks**
- various efforts by the State to act despite data gaps**

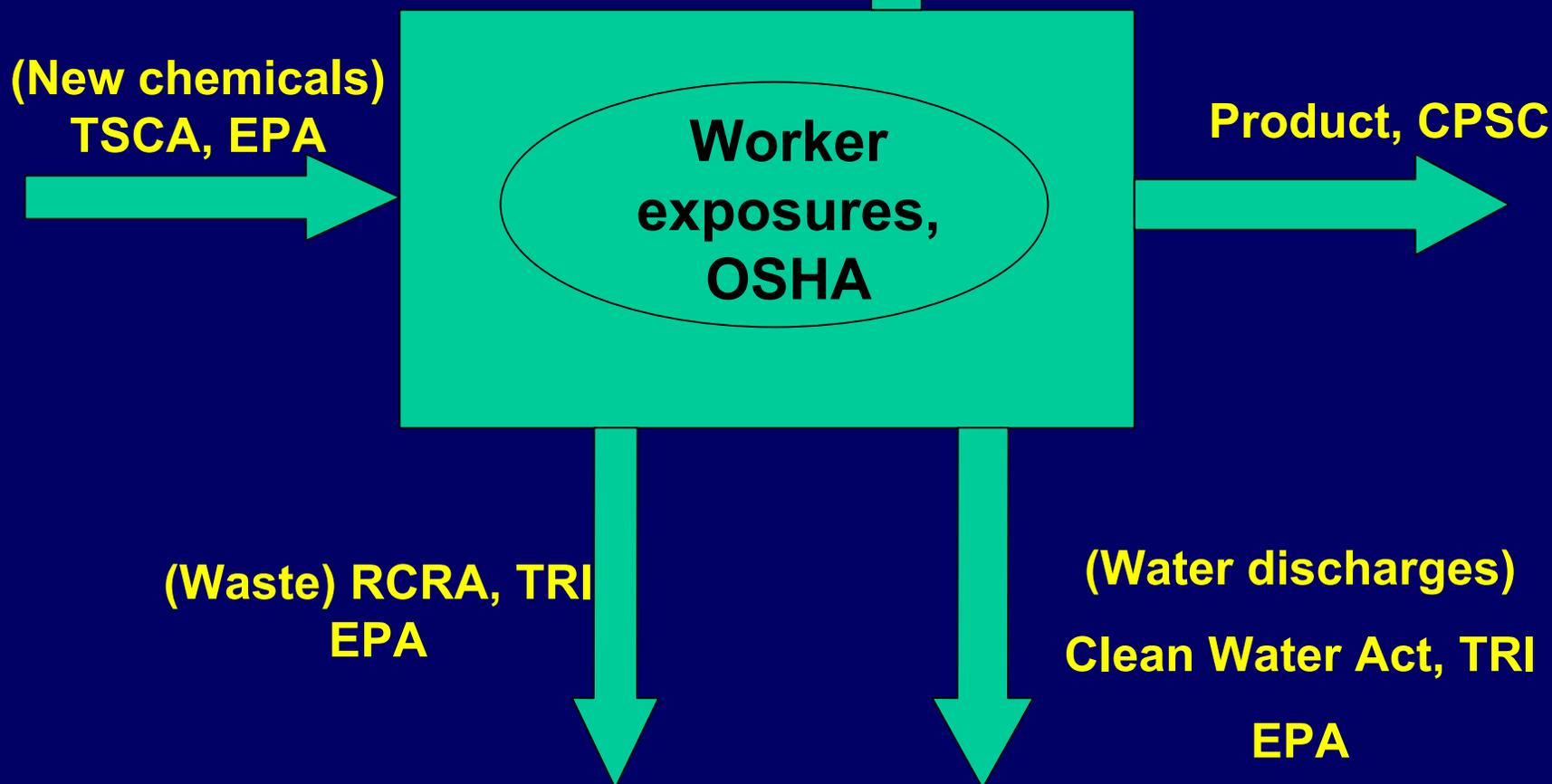
**Needed in California: To address data gaps, transfer evidentiary burden to industry, improve State authority to regulate as a condition of market entry.**

# State of knowledge





**Most statutes are “end-of-pipe”, information strategies or permissible exposure approaches, with exception of TSCA.**



# State of Knowledge - TSCA



- ❖ **TSCA addresses 72,000 industrial chemicals “prior to manufacturing”, except;**
- ❖ **Substantial procedural and evidentiary burden on EPA to acquire toxicity data from industry and to restrict use**
- ❖ **“Existing” chemicals in 1979 “grandfathered”; no data required ( = 99% of chemicals in commerce today).**
- ❖ **EPA reliance on voluntary initiatives (HPV Challenge program). Up to 60% of 2,800 HPV chemicals now tested. 70,000 others mostly unknown.**

# State of Knowledge - California



- ❖ **Inadequate State-level data on industrial chemicals in commerce:**
  - 1) **Identification**
  - 2) **Quantities**
  - 3) **Distribution**
  - 4) **Use**
  - 5) **Toxicity**
  - 6) **Exposure**
  
- ❖ **CUPA and PUR system flawed but promising.**



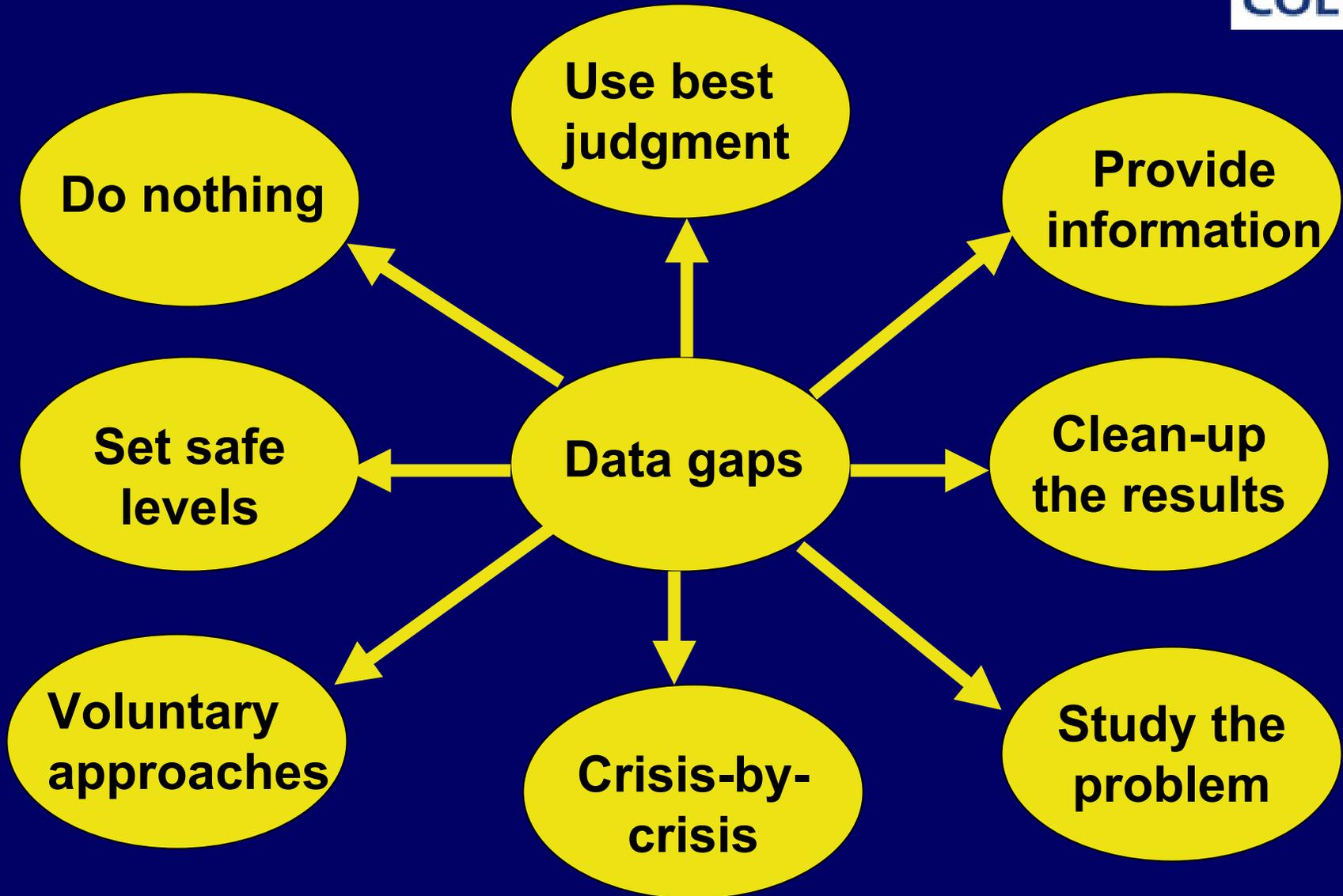
**We are therefore unable to systematically evaluate and prioritize chemical hazards in California.**

# Data gap consequences:

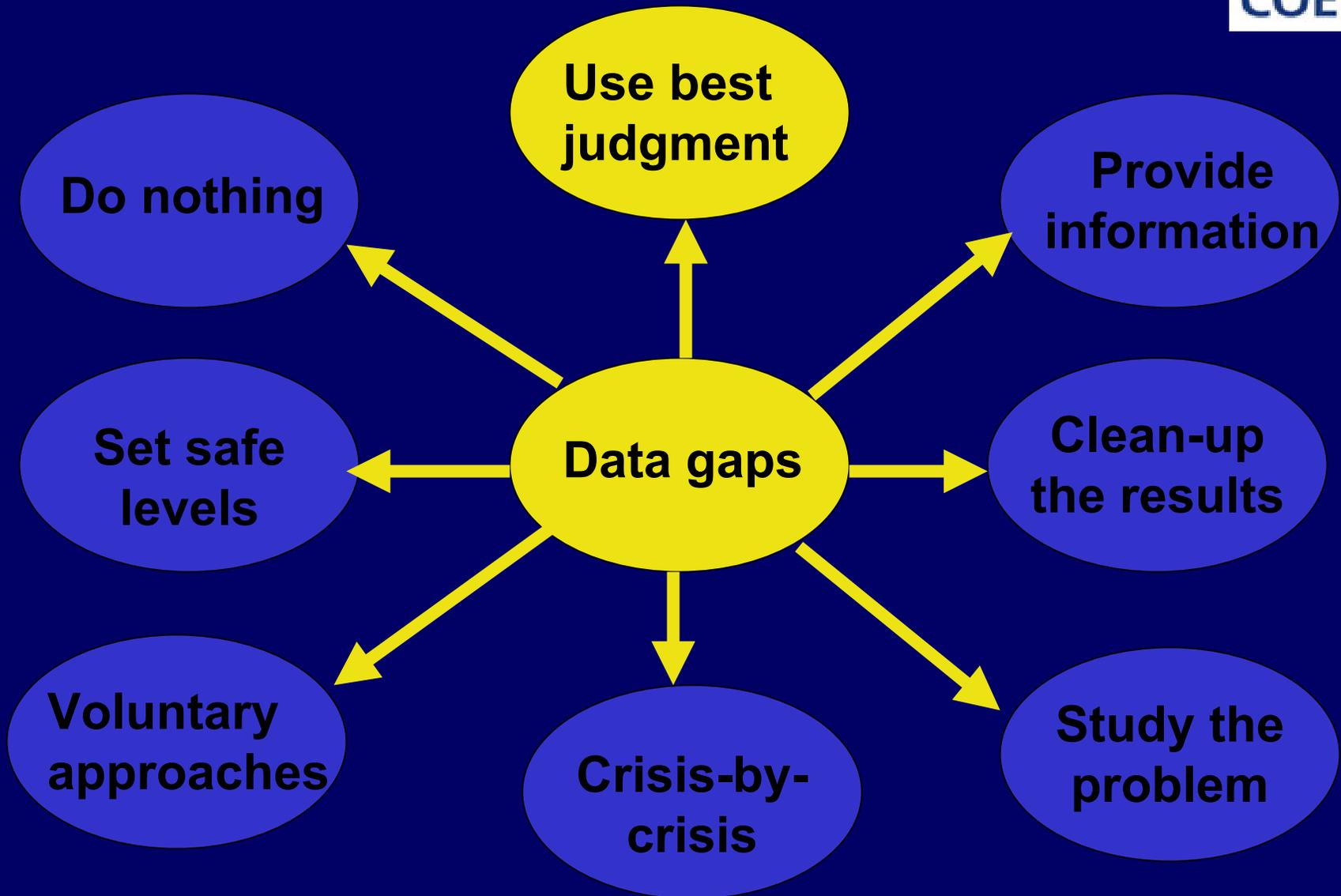


- ❖ **Legislature: Inability to recognize (and allocate resources to) priority chemical concerns and their diseases;**
- ❖ **Government Agencies: Inability to systematically address hazards, track disease and exposure trends; target outreach;**
- ❖ **Research Institutions: Inability to characterize exposure, risk and disease outcomes of priority chemicals;**
- ❖ **Business and industry: Increased and often conflicting regulations; market failures (e.g. unanticipated costs);**
- ❖ **Public, labor and NGOs: Inability to ID and advocate for changes related to priority chemical concerns.**

# Strategy options, given inadequate data



# Strategy options, given inadequate data



**Laws & policies: Perchloroethylene, hexane and neurological disease in the California vehicle repair industry**



**Harrison et al. MMWR, Nov 16**

**2001, Vol 50 #5, [mmwr.gov](http://mmwr.gov)**

# What is hexane?



- ❖ **A petroleum distillate used for cutting grease and oil**
- ❖ **A mixture of isomers; 20-80% is *n*-hexane**
- ❖ ***n*-Hexane identified in 1964 as a peripheral neurotoxin**
- ❖ **Co-exposure with acetone may amplify effects**

**Cases #1, #2 #3:  
25, 45 and 52 y/o vehicle repair technicians**



- **Presentation**
  - Numbness from hips to feet, mid-forearm to fingers, loss of grip strength
  - Ataxia
  - Totally disabled, unemployed
- **Exposure**
  - Daily occupational exposure to cleaning solvents containing 10 to 90% hexane, blended with acetone.

# Follow-up cases



**11 additional technicians fit case definition for hexane-induced peripheral neuropathy.**

**Some disabled, unemployed; some employed with early signs of disease.**

*(Use of photographs approved by Committee for the Protection of Human Subjects, UC Berkeley, file #2000-9-43)*



**About 85,700 vehicle repair technicians are employed in CA.**

***(CA EDD, 2000)***



## Chemical demographic data gap:

Working with OHB, we were unable to identify sales trends, volumes in commerce, use locations or suppliers of hexane-based products in the vehicle repair industry. We attempted voluntary industry surveys until ARB database identified.





**Over five million aerosol cans of brake cleaning solvent are used in CA repair shops each year (ARB, 2000).**

# Aerosol brake cleaning solvents used in 14,400 CA vehicle repair shops (ARB, 2001)



- Chlorinated Solvents
- 26% = 3,700 CA shops
  - Perchloroethylene
  - Trichloroethylene (TCE)
  - Methylene Chloride

- Non-chlorinated Solvents
- 50% = 7,200 CA shops
  - Hexane
  - Acetone → 60%
  - Toluene
  - Heptane
  - Methyl Ethyl Ketone
  - Xylene
  - Methanol



**Hexane is a well-known neurotoxic solvent, so....**

- ❖ When and why was hexane introduced into the California vehicle repair industry?**
- ❖ How does this inform our thinking about chemicals management?**



## ***Brake Cleaner National Survey Project***

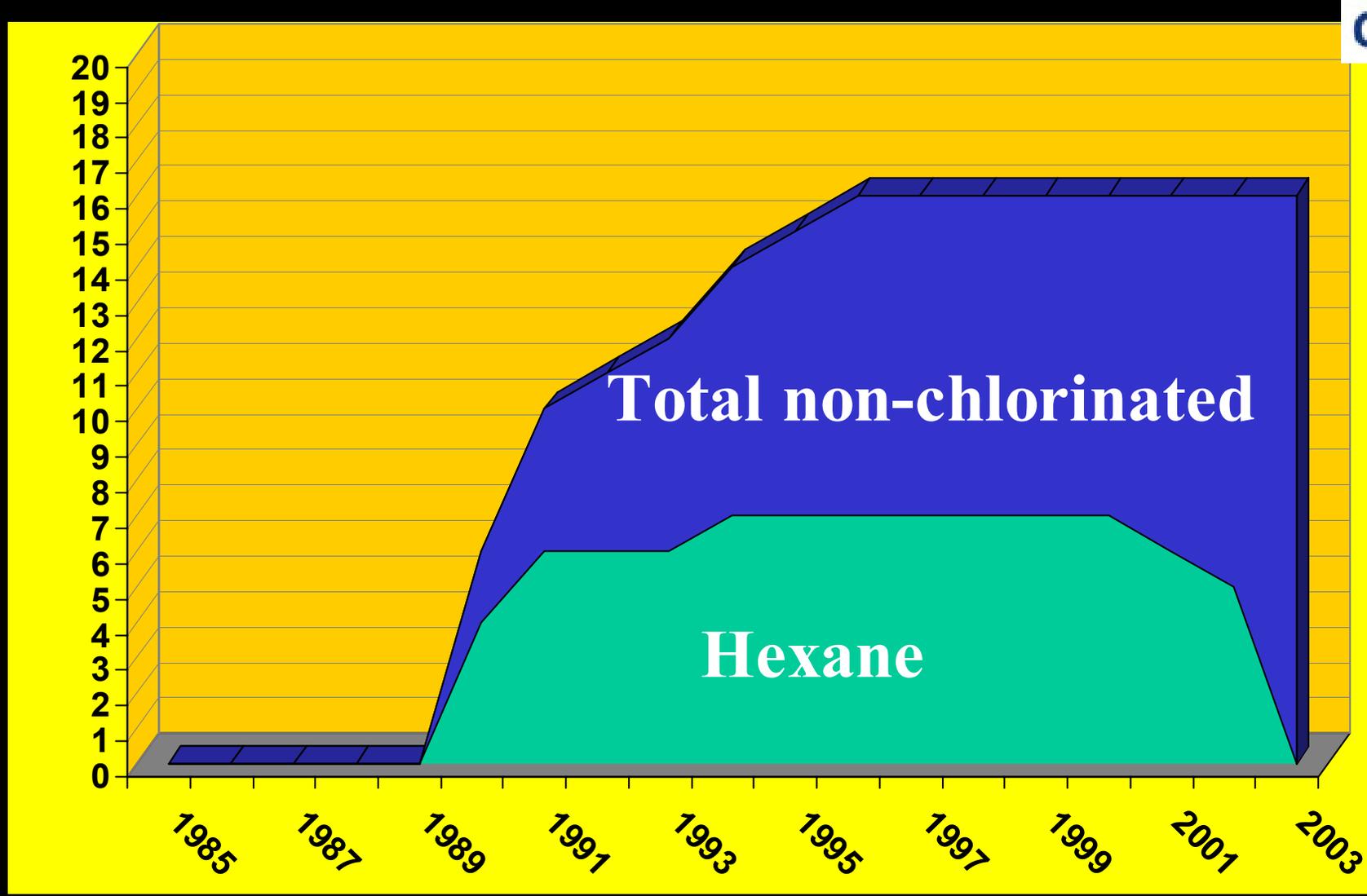
- ❖ **23 solvent suppliers sold products in the CA vehicle repair industry (ARB 1997) .**
- ❖ **18 of these suppliers represented over 90% of solvent sales in California (ARB, 1997).**
- ❖ **Follow-up interviews with 13 industry representatives, four ARB staff, five shop owners.**



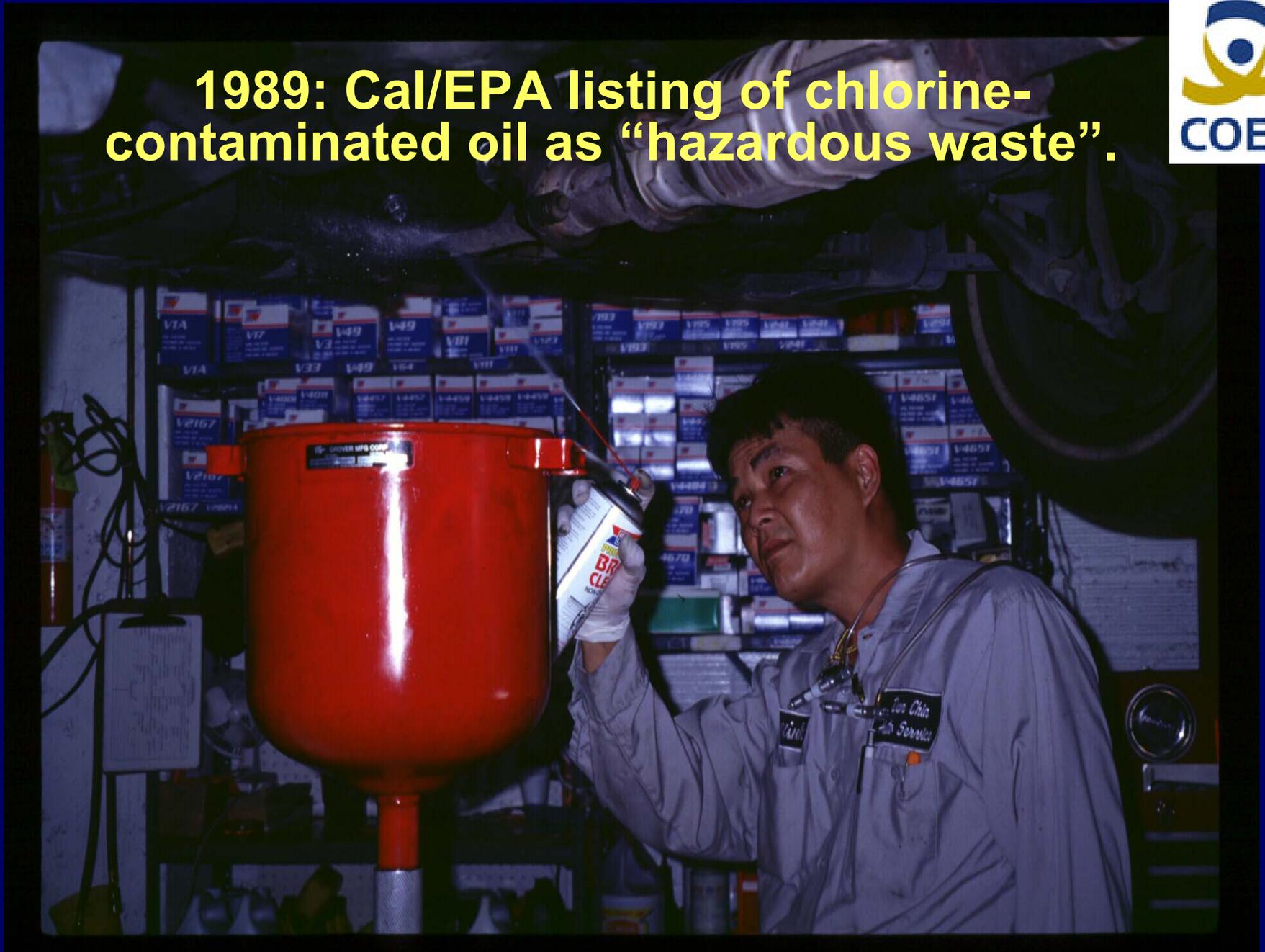
## *Brake Cleaner National Survey Project: Results*

- ❖ Usable response rate: 17/23 (74%).
- ❖ All large suppliers represented (>90% sales).

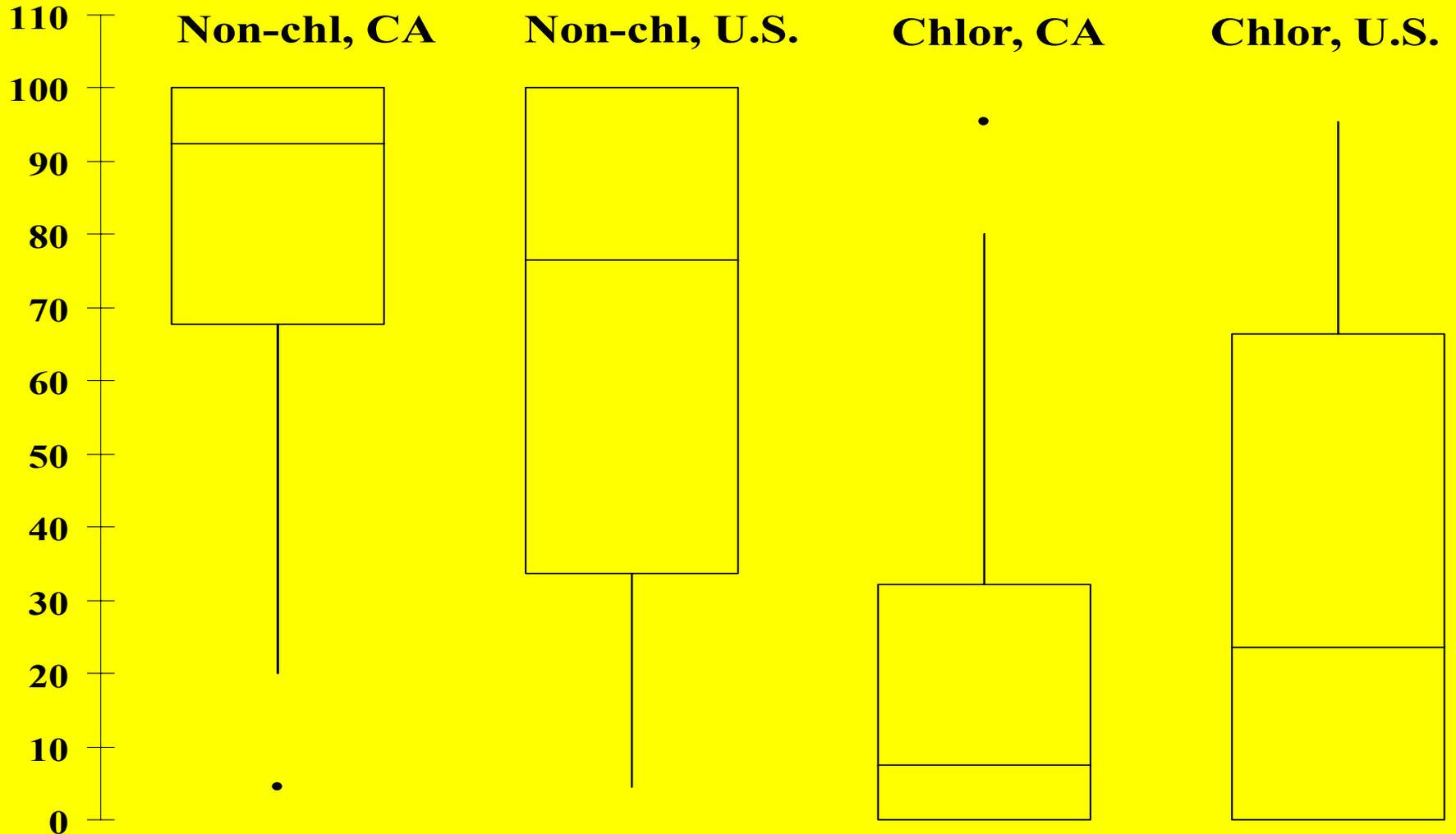
# Manufacturers producing hexane-based brake-cleaning products, 1988 – 2003 (hexane = 7/17)



**1989: Cal/EPA listing of chlorine-contaminated oil as “hazardous waste”.**



# Percent of sales of aerosol brake cleaning products in CA and the U.S., FY 2000 (n = 17 firms, 90% of CA sales)





## **Agency effectiveness:**

**Generally: In an environment of incomplete information and in the absence of a comprehensive, integrated chemical management program, acting on our best judgment can result in the generation of new, unanticipated consequences.**

**More narrowly: Product reformulations engendered by California regulations will likely have national implications in the affected industry.**

# New Directions in European Union Chemicals Policy

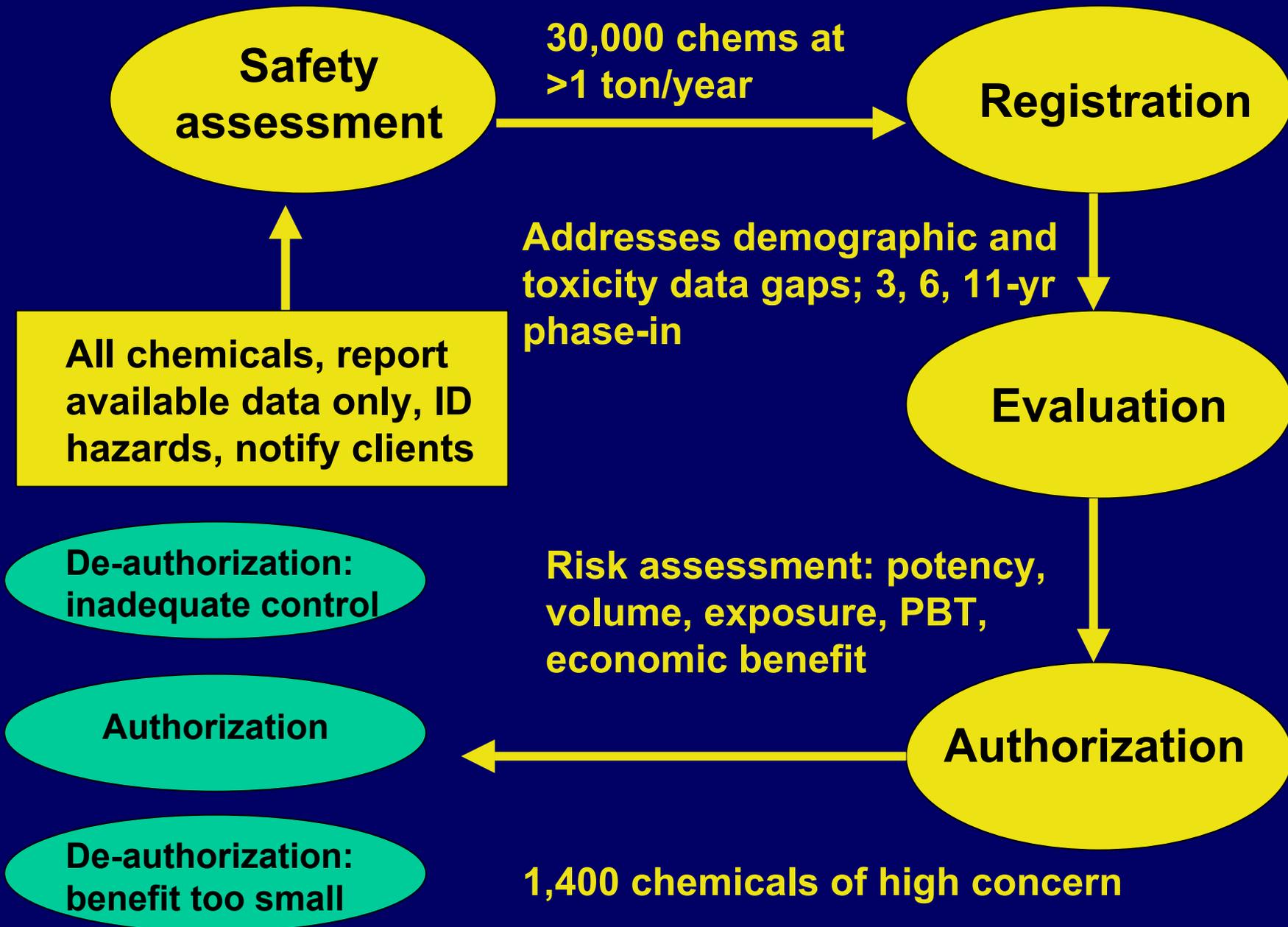


- ❖ **Faced with similar problems, EU moving forward with major restructuring of chemicals policy**
- ❖ **Centerpiece is the REACH initiative (Registration, Evaluation and Authorization of Chemicals)**
- ❖ **REACH represents an opportunity for broad-based reevaluation of chemicals policy in the U.S.**

# New Directions in The European Union Chemicals Policy: REACH



- ❖ **Based on a 2001 White Paper issued by the European Commission**
- ❖ **A duty of care on chemical producers & importers**
- ❖ **Protection of internal market**
- ❖ **Stimulate innovation in safer chemicals**
- ❖ **Substitute chemicals of high concern**
- ❖ **Address data gap between “new” and “existing” chemicals**
- ❖ **Reduce animal testing**



# REACH: the new EU Chemicals Agency



- ❖ **Centralized database on chemicals under registration & authorization**
- ❖ **Centralized registration; integrated analysis to avoid risk shifting; authorization and enforcement**
- ❖ **Introduction of socio-economic factors in risk assessment**
- ❖ **Receiver of registration fees, forum for exchange of information**

# REACH: areas of debate



- ❖ **“Offshoring” of chemical industry**
- ❖ **Nature of “control” of high hazard chemicals**
- ❖ **Nature of socio-economic factors in risk assessment**
- ❖ **Confidentiality of data**



**Imported electronic waste, Lianjiang River, Guiyu, China**  
**All China photos copyright 2001, Basel Action Network**



**Electronic waste recovery workers, Guiyu, China**



**Electronic waste recovery workers, Guiyu, China**

**Hazards: lead, phosphor dust, arsenic, cadmium, barium, silver, selenium, chromium; dumping and combustion of plastics mercury**



**Toner recovery worker, Guiyu, China**  
**Carbon black (IARC 2A carcinogen); cartridge dumping**



**Burning of plastic-encased printer and motor parts to recover metals, Guiyu, China**



## REACH: Opportunities for California

- ❖ **Innovation**: Authorization process is driver of innovation. Meeting EU standards could introduce R & D in “safer chemical products” by California producers
- ❖ **Data**: Producers will generate testing data to maintain EU markets; these data could be available to California chemical industry
- ❖ **Harmonization**: International harmonizing of chemical testing, evaluation and authorization standards reduces barrier to change