



# **Green Science Policy Institute**

## **Fire Safety without Harm: California's Changing Flammability Regulations**

**Arlene Blum PhD**

**University of California, Berkeley**

**Green Science Policy Institute**

# U.S. Toxic Substances Control Act, 1976

- 62,000 previous chemicals “grandfathered”
- 20,000 new chemicals
  - 85 % have no health data
  - 67 % have no data at all



# 1970s Flammability Standards

- Children's sleepwear
- Furniture
- Foam plastic building insulation

# Brominated Tris Flame Retardant

*Tris (2,3-dibromopropyl) phosphate*

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- In children's sleepwear 1975 to 1977
- Up to 10% of the weight of fabric
- In children's urine
- Mutagen and possible carcinogen



Science, January 7, 1977

# **Flame-Retardant Additives as Possible Cancer Hazards**

**The main flame retardant in children's pajamas is a  
mutagen and should not be used.**

**Arlene Blum and Bruce N. Ames**



U.S. Consumer Product  
Safety Commission

# TRIS-Treated Children's Garments Banned

April , 1977

Chlorinated Tris replaced Brominated Tris

- Removed from pajamas in 1978
- Used in furniture until 2012

# Technical Bulletin 117



- Required furniture foam to withstand a small open flame for 12 seconds
- No significant fire safety benefit (fires start in exterior fabric not filling)

# Animal health effects

- Chronic toxicity: long term impacts
  - **Endocrine disruption:** Interference with thyroid hormone action
  - **Neurodevelopment:** Decreased memory, learning deficits, altered motor behavior, hyperactivity
  - **Reproductive system effects:** Abnormal gonadal development, reduced ovarian follicles, reduced sperm count
  - **Immune suppression**
  - **Cancer**



# Human Health

Higher pentaBDE

associated with

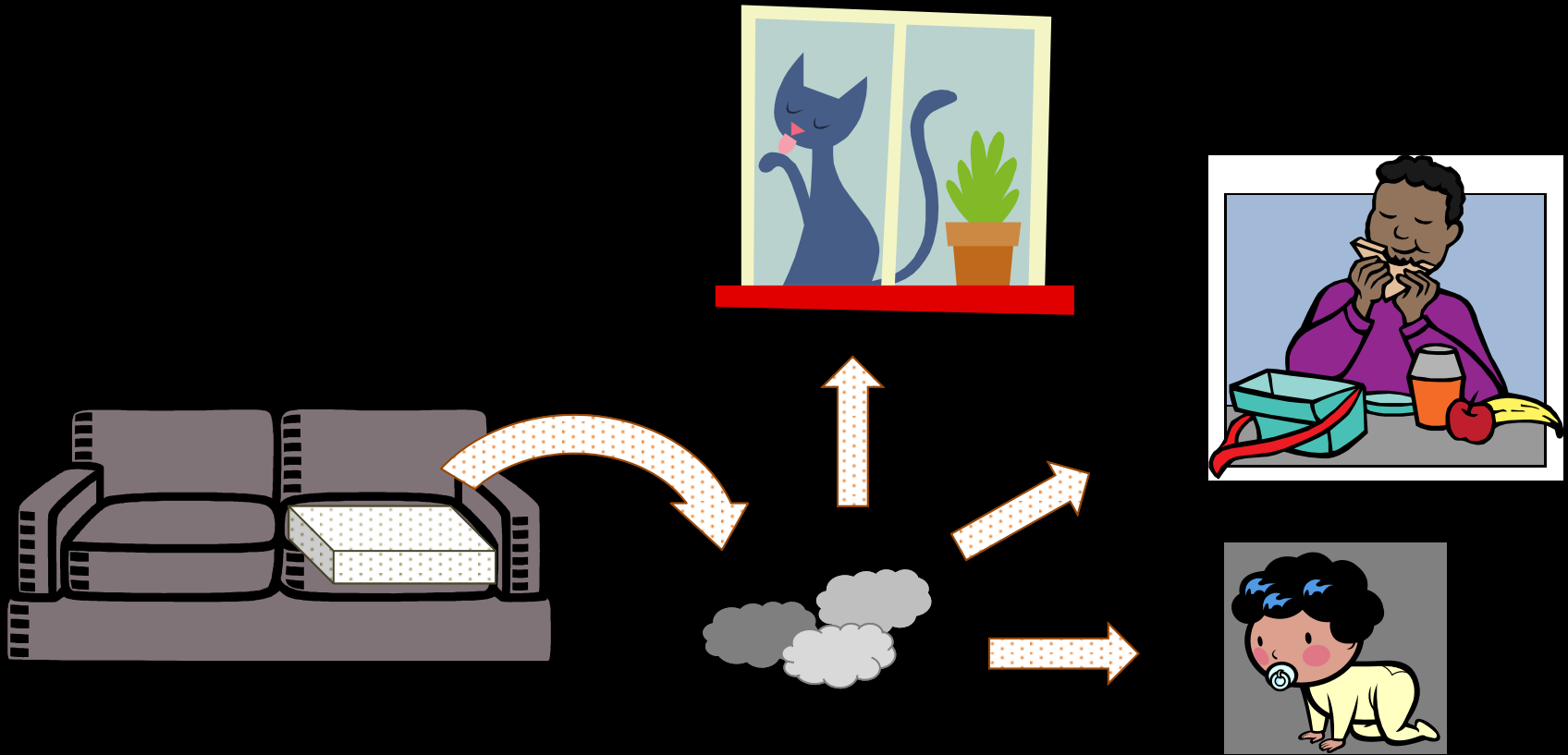
lower birth weight  
impaired attention  
poorer coordination  
lowered IQ



longer time to get pregnant  
altered thyroid hormones



# From Products to People



# Global pollutants

Migrate towards north and south poles



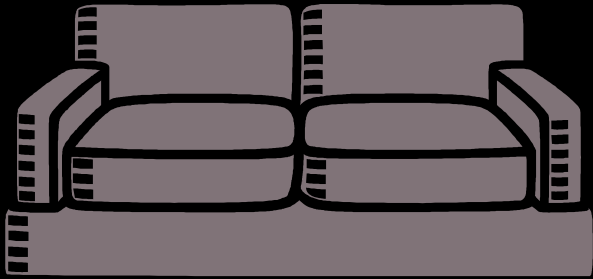




97 ppm to 3 ppm

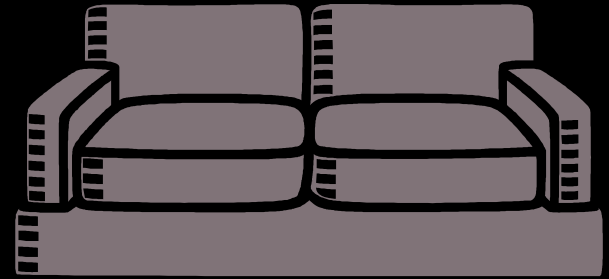
# TB117 Fire Safety Benefit?

TB117 foam



~

Non - TB117 foam

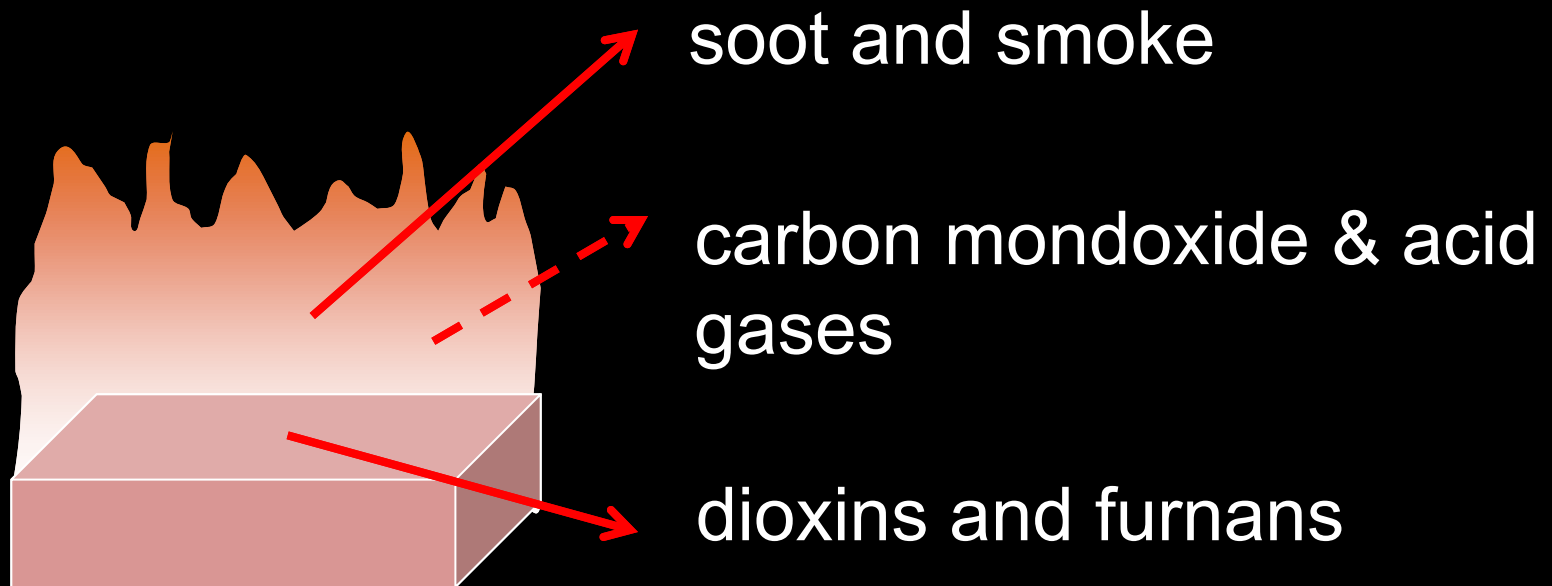


“No significant, consistent difference...”

# Fire toxicity

Flame retardants can delay,  
but do not prevent foam from burning

When foam does burn, flame retardants can  
increase....



# Firefighters

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- Elevated rates of
  - multiple myeloma
  - non-Hodgkin's lymphoma
  - prostate cancer
  - testicular cancer
- associated with dioxin/furan exposure

G.K. LeMasters, et al, Journal of Occupational and Environmental Medicine  
48(11): 1189-202(2006). NIOSH (2014)

# Increased fire safety without flame retardants



Assembly Bill 706, Senate Bill 772, Senate Bill 1291, Senate Bill 147



**A DEADLY MISTAKE**

Help stop the bill that will ban material used to make flame resistant products.

CALL YOUR STATE SENATOR TODAY AND TELL THEM TO  
**VOTE NO ON AB 706**

Call State Senator  
**Tom Torlakson**  
at **916-651-4007** and tell him to  
**VOTE NO** on AB 706.

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Richmond, CA 94804-5339

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**DON'T LET THE SACRAMENTO POLITICIANS BAN THE USE OF  
PROVEN FLAME RETARDANTS-IT COULD BE A DEADLY MISTAKE**

## Paid for by Californians for Fire Safety:

- Albemarle
- Chemtura
- Israel Chemicals LTD (ICL)



## TRIBUNE WATCHDOG

# Playing with fire

A deceptive campaign by industry brought toxic flame retardants into our homes and into our bodies. And the chemicals don't even work as promised.

BY PATRICIA CALLAHAN AND SAM ROE  
*Tribune reporters*

**D**r. David Heimbach knows how to tell a story. Before California lawmakers last year, the noted burn surgeon drew gasps from the crowd as he described a 7-week-old baby girl who was burned in a fire started by a candle while she lay on a pillow that lacked flame retardant chemicals.

"Now this is a tiny little person, no bigger than my Italian greyhound at home," said Heimbach, gesturing to approximate the baby's size. "Half of her body was severely burned. She ultimately died after about three weeks of pain and misery in the hospital."

Heimbach's passionate testimony about the baby's death made the long-term health concerns about flame retardants voiced by doctors, environmentalists and even firefighters sound abstract and petty.

But there was a problem with his testimony: It wasn't true. Records show there was no dangerous pillow or candle fire. The baby he described didn't exist.

Neither did the 9-week-old patient who Heimbach told California legislators died in a candle fire in 2009. Nor did the 6-week-old patient who he told Alaska lawmakers was fatally burned in her crib in 2010.

Heimbach is not just a prominent burn doctor. He is a star witness for the manufacturers of flame retardants.

His testimony, the Tribune found, is part of 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 tactics started with Big Tobacco, which wanted to shift focus away from cigarettes as the cause of fire deaths, and continued as chemical companies worked to preserve a lucrative market for their products, according to a Tribune review of thousands of government, scientific and internal industry

stoked the public's fear of fire and helped organize and steer an association of top fire officials that spent more than a decade campaigning for their cause.

Today, scientists know that some flame retardants escape from household products and settle in dust. That's why toddlers, who play on the floor and put things in their mouths, generally have far higher levels of these chemicals in their bodies than their parents.

Blood levels of certain widely used flame retardants doubled in adults every two to five years between 1970 and 2004. More recent studies show levels haven't declined in the U.S. even though some of the chemicals have been pulled from the market. A typical American baby is born with the highest recorded concentrations of flame retardants among infants in the world.

People might be willing to accept the health risks if the



Pulitzer Prize

Finalist

Goldsmith Prize

Investigative Reporting

Environmental

Journalists Society

Environmental Reporting

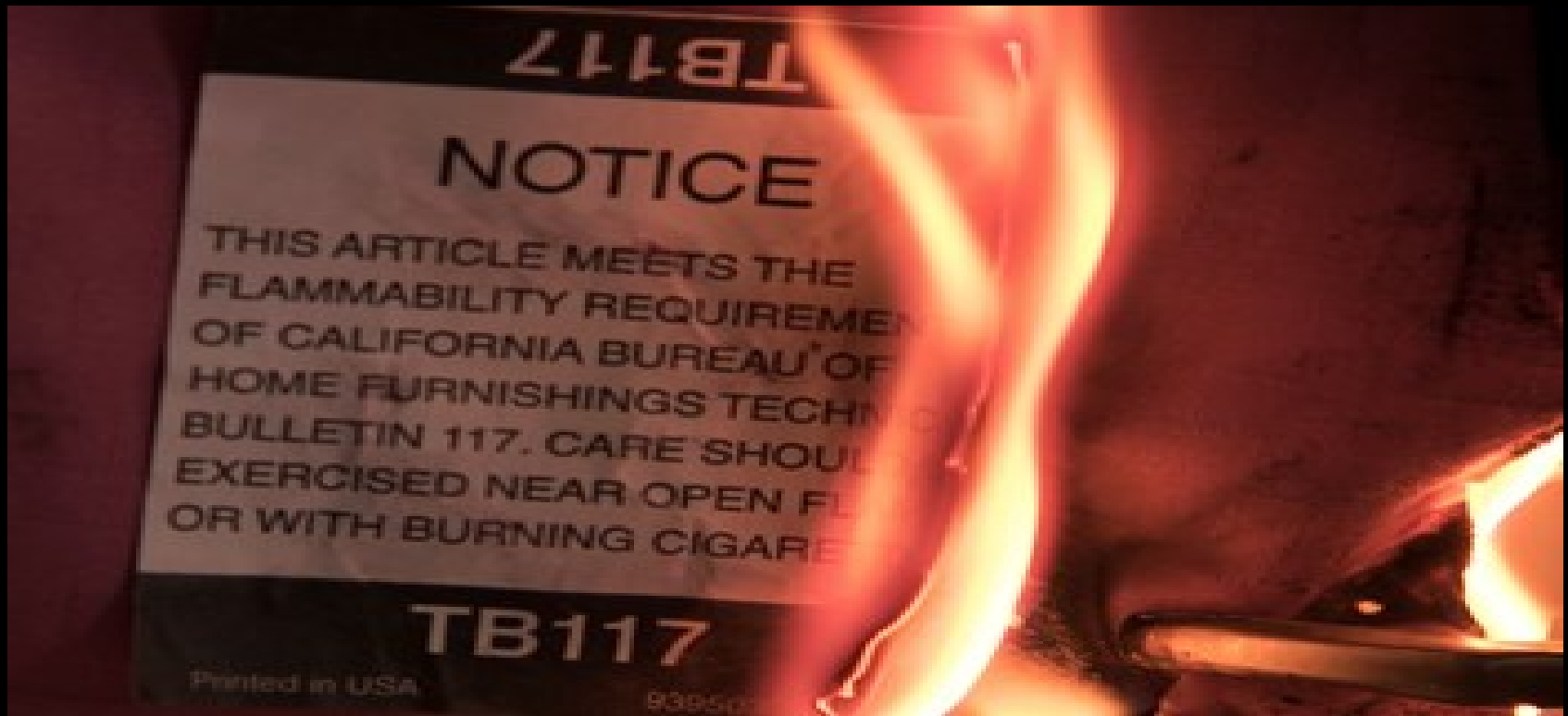
Gerald Loeb Award

Business and Financial Journalism

National Press Club

Consumer Award

# Toxic Hot Seat



A film about stopping the use of the harmful and ineffective flame retardants in furniture and baby products

Rent it at <http://vimeo.com/ondemand/toxichotseat>



Office of Governor

**Edmund G. Brown Jr.**



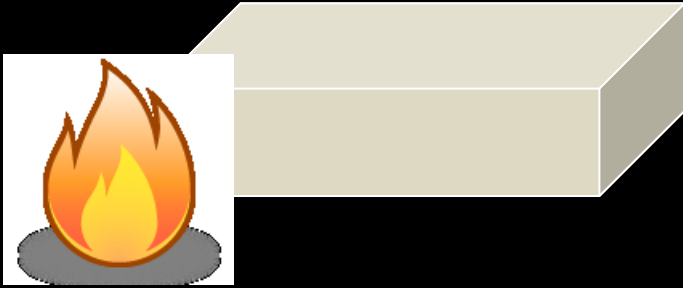
June 18, 2012

## Governor Brown Directs State Agencies to Revise Flammability Standards

‘We must find better ways to meet fire safety standards by reducing and eliminating - wherever possible - dangerous chemicals.’

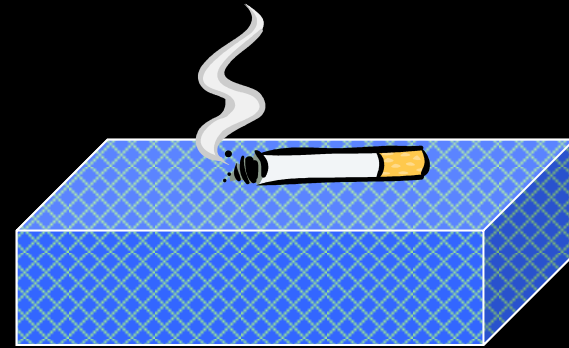
# Open flame versus smolder?

TB117 regulates  
furniture filling



- Flame retardants used to meet this open flame standard

Fires start on fabric



Most start with smoldering:

- Cigarettes
- Electrical sources

# California Flammability Standard TB117-2013

- Mandatory January 1, 2015
- Flame retardants not needed, but can still be used



# Senate Bill 1019

- Effective January 1, 2015  
for products that meet  
TB117-2013

## NOTICE

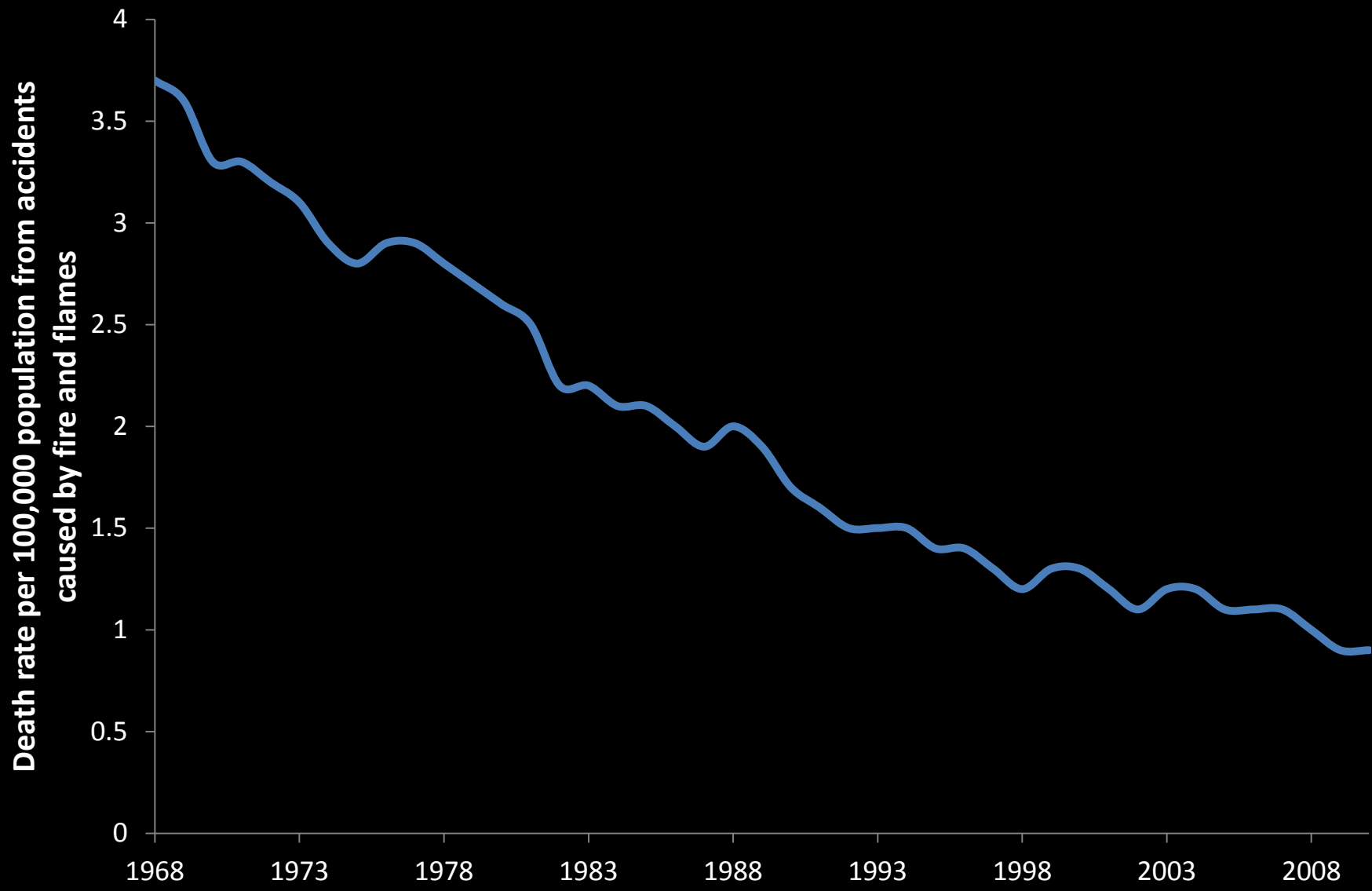
THIS ARTICLE MEETS THE FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF ELECTRONIC AND APPLIANCE REPAIR, HOME FURNISHINGS AND THERMAL INSULATION TECHNICAL BULLETIN 117-2013. CARE SHOULD BE EXERCISED NEAR OPEN FLAME OR WITH BURNING CIGARETTES.

The upholstery materials in this product:

contain added flame retardant chemicals  
 contain NO added flame retardant chemicals

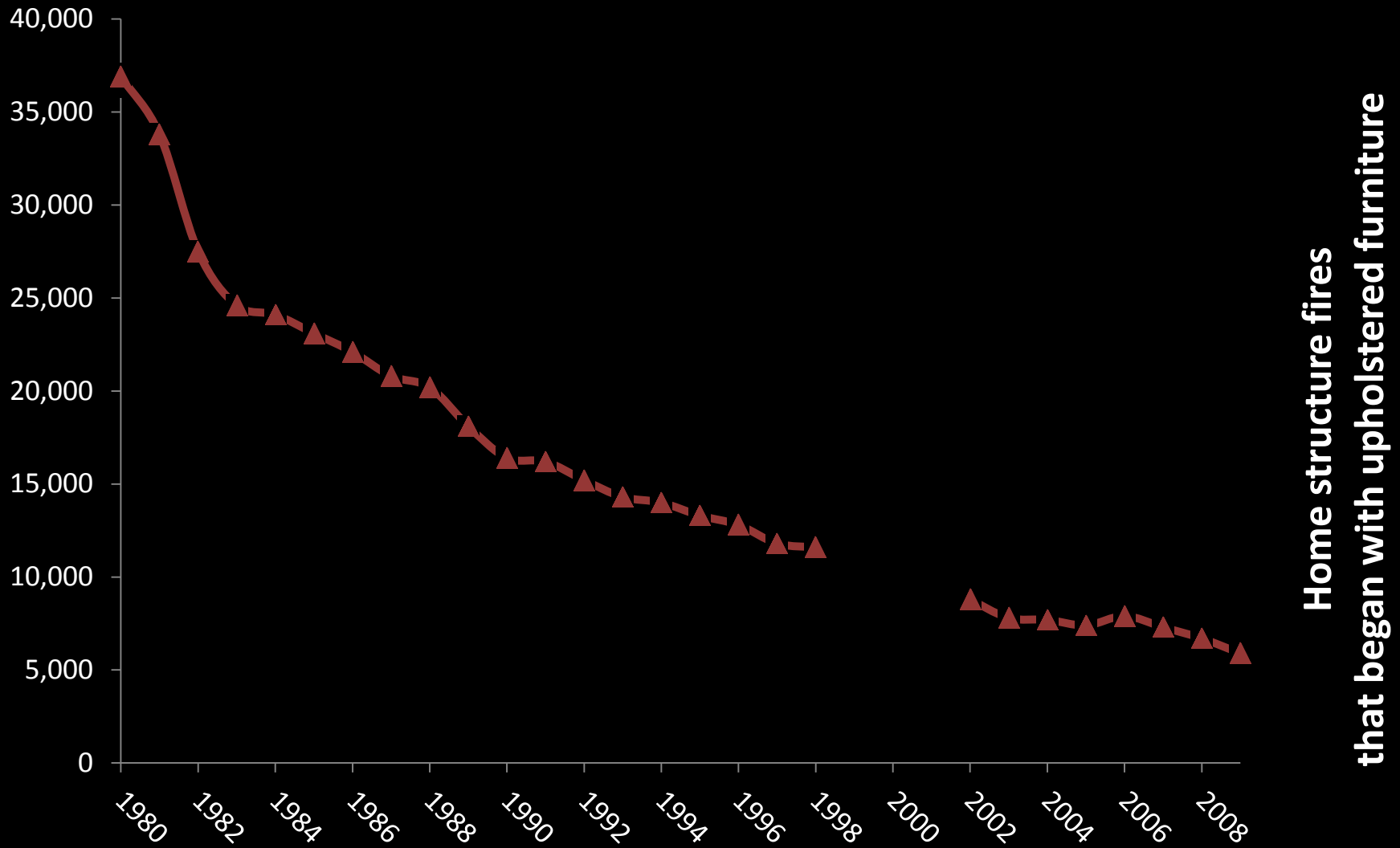
The State of California has updated the flammability standard and determined the fire safety requirements for this product can be met without adding flame retardant chemicals. The State has identified many flame retardant chemicals as being known to, or strongly suspected of, adversely impacting human health or development.

# Rate of fire deaths decreasing





# Fires that start in furniture decreasing

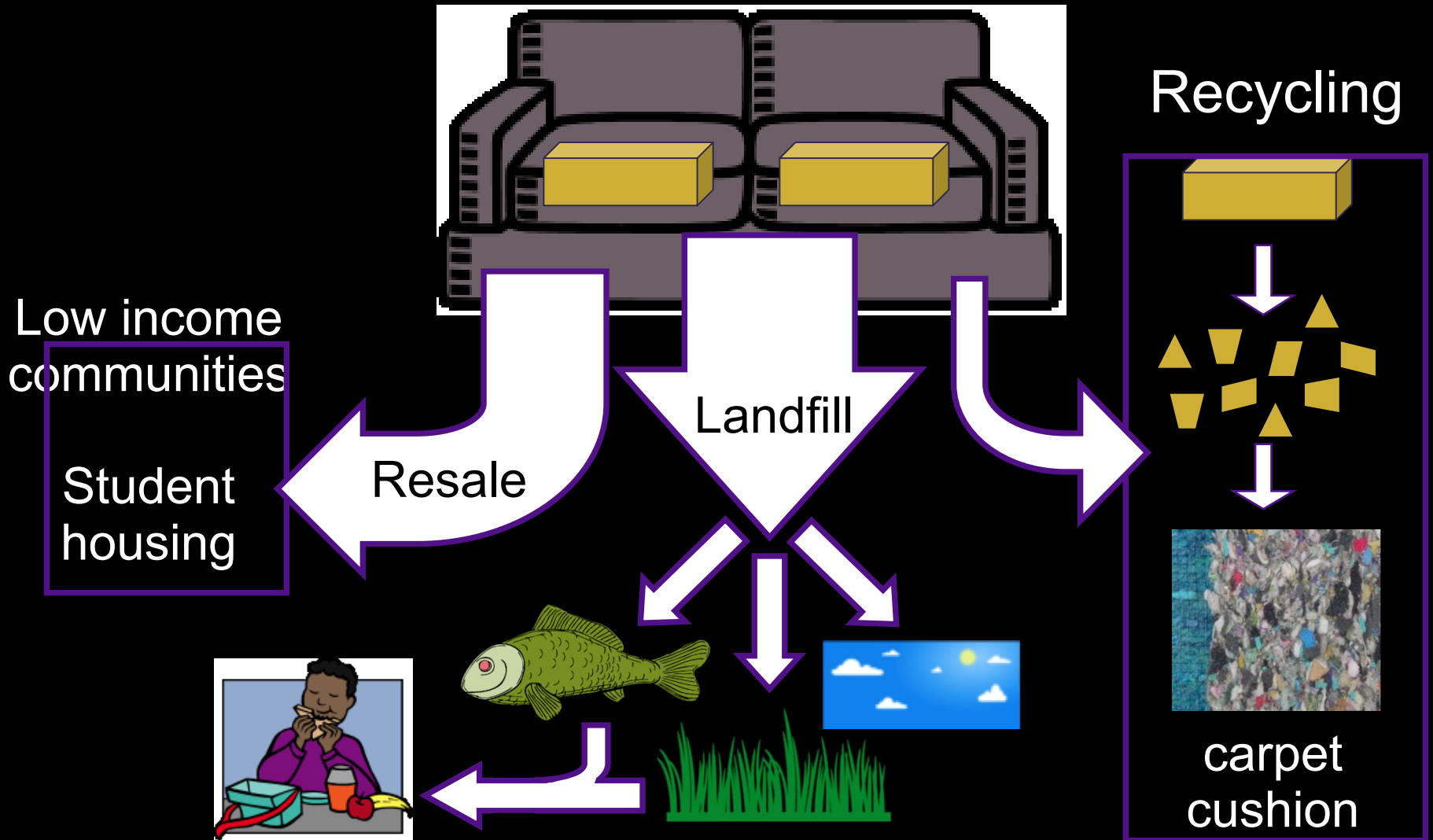


Home structure fires  
that began with upholstered furniture

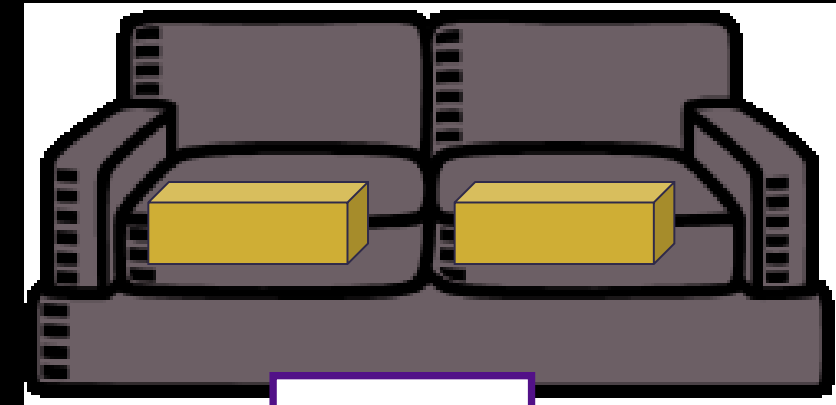
# Fire safety tools

- Decrease in smoking/ fire-safe cigarettes
  - Fire-safe candles, child-safe lighters
  - Smoke detectors/ alarms
  - Sprinklers
  - Work of fire service
  - Fire codes
  - Fire safety education
  - Furniture regulations
    - Smolder standard: TB117-2013
    - Open flame: TB117
- (Open flame standards have potential for harm)

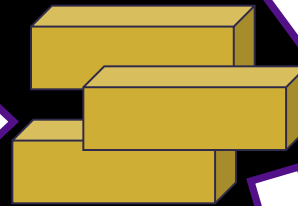
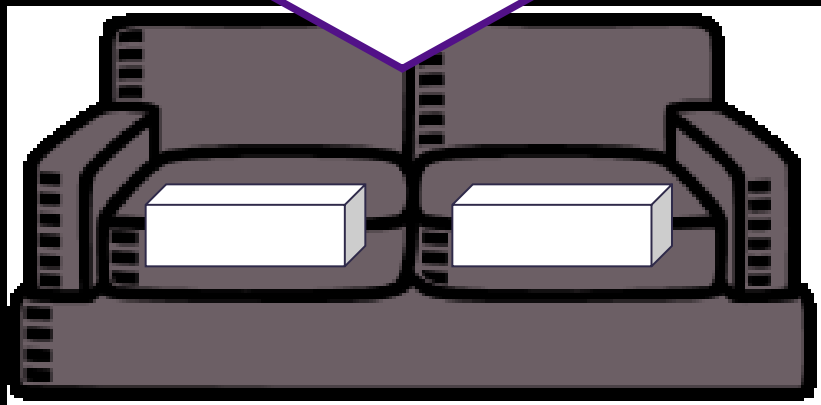
# Where does flame retarded foam end up?



# Better Solutions

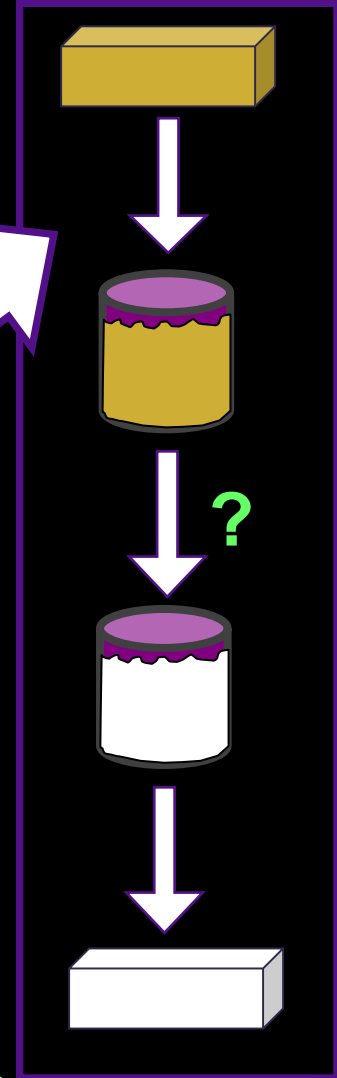


Foam Exchange



High Temp Combustion??

## Chemical Recycling?



# What to do with millions of foam and plastic items with harmful flame retardants

2 day workshop hosted by UC Berkeley and GSP  
November, 2015  
Washington, DC

For more information, contact:

Donald Lucas

[D\\_lucas@lbl.gov](mailto:D_lucas@lbl.gov)

510-316-6764




# What to do?

- Replace the foam in your furniture.
- Buy furniture with a TB117-2013 label
  - Look for products without added flame retardants
- Vacuum, wet mop, hand wash



<http://greensciencepolicy.org/consumers>





For more information  
[www.greensciencepolicy.org](http://www.greensciencepolicy.org)  
to join our e-list

**Please give Arlene your card  
Or sign our e-list**



# **MANY THANKS TO:**

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**Eileen Kramer**

**Anna Soehl**

**Gretta Goldenman**



**With improved flammability standards**

**We can have both fire safety  
and a healthy world.**

**Google: Green Science Policy**  
**[www.GreenSciencePolicy.org](http://www.GreenSciencePolicy.org)**