



**Lowell Center** for Sustainable Production

UNIVERSITY OF MASSACHUSETTS LOWELL

# **Alternatives Assessment Discussion Webinar:**

## **Safer Substitutes for Flame Retardant Chemicals**

### **Framing the Issues**



**APRIL 30, 2014**

**FACILITATED BY: JOEL TICKNER, SCD**

**JOEL\_TICKNER@UML.EDU**

**LOWELL CENTER FOR SUSTAINABLE PRODUCTION,  
UMASS LOWELL**

# Goals



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- Continuing education and dialog
- To advance the practice of alternatives assessment for informed substitution across federal, state, and local agencies through networking, sharing of experiences, development of common approaches, tools, datasets and frameworks, and creation of a community of practice.

# Background



- Addressing chemical flame retardants represents an important cross- agency chemicals management problem.
- Flame retardants often serve important fire protection roles, but concerns have been raised about the environmental persistence and toxicity of many current flame retardants and their replacements.
- Restrictions on flame retardant chemicals of concern may have the unintended consequence of their replacement by other problematic substances or lack of availability of alternatives. In some cases, substitution has not been accompanied by careful alternatives assessments.

# Background



- **Fire safety a continued issue particularly in high risk environments**
  - Time to escape in some situations decreasing as more highly flammable materials are inserted into the built environment.
  - Many fire retardancy standards require the use of additive flame retardants. Questions about necessity in some cases given evolving fire science.
  - Increasing number and diversity of flame retardants and classes, including how they work
  - Fire prevention and fire safety are moving targets – changing building design, materials, fire risks and safeguards
- **Increasing health and environmental concern about many flame retardant chemicals**
  - Toxicological evidence
  - Exposure evidence

# Questions about alternatives



- **Where is the chemical in the supply chain? Who knows? How much effort to determine?**
- **What is the viability of substitutes?**
  - Varied applications and performance requirements
  - Is there sufficient supply of alternatives for particular applications
  - Substantial time and funding needed to test and verify substitutes
- **What is the human health and environmental profile?**
  - Lots of data gaps
  - Lots of different flame retardant chemicals
  - Increasing exposure data
  - End of life and worker health concerns?

# Challenges



- How to avoid unintended consequences?
- How to address changing regulatory landscape (both flame retardancy and chemicals regulations)?
- How to move beyond drop-in substitutes to design, material, and green chemistry alternatives?
- How can we use new data streams to move rapidly evaluate the hazards associated with flame retardant chemical alternatives?
- How to evaluate current fire risk and develop new standards?

# Directions for Interagency Discussion



- **Fire Science**
  - Identification of product types for which flame retardancy may not be as necessary
  - Evaluation of current fire risks (changes in risks); development of appropriate new fire safety standards for priority products; impact on building egress
- **Safer alternatives**
  - Identification of tools to compare chemical and non-chemical alternatives to flame retardants – how do we go beyond chemical to chemical comparisons
- **Green chemistry – developing safer materials and flame retardants**
  - What is the effectiveness of alternative animal models (zebrafish) for screening FR toxicity
  - What are the opportunities for interagency collaborative in the research and development of alternative flame retardant materials as well as policies

# Questions for Discussion



- These issues are at the intersection of fire science and chemical flame retardants. How do we get a better handle on the big picture of fire science, standards, and flame retardants?
- Focus of FRs has been on EH&S impacts of the FRs themselves during mfr, use and disposal. What about occupational health and safety concerns of fire fighters, e.g., exposure to products of combustion from materials and FRs.
- Are there specific challenges within government agencies that could be helped by having interagency input and cooperation?
- Who is not on the call that should be included in the conversation?



# Questions for discussion



- What is the role of alternatives assessment in regulatory agencies whose mandate is to ensure safety or avoid unacceptable risks?
- How can alternatives assessment support evaluation and adoption of informed substitutes while meeting safety standards (given a different focus on hazard reduction versus exposure-basis)? Or is there a need for a different type of safety standard, i.e. criteria for a particular function/process, that would allow the use of alternatives meeting those criteria?
- Where does exposure assessment fit in in such efforts?
- Can we avoid time consuming and resource intensive debates over acceptable levels of exposure if we focus on alternatives assessment?

# Overall goal



- Certain flame retardants have been identified as problematic and have been replaced by other problematic ones in certain applications? How do we support the transition to safer alternatives given changes in understanding of fire science.

# Agencies Represented



- NIEHS
- OSHA
- EPA
- Environment Canada
- DoD
- NASA
- States: NJ, MA, WA, CA, MI, MN
- Others: SF, PPRC