CiP Building Products Case Study: Analysis of Findings and Recommendations

Presented by Jack R. Geibig, Director
Center for Clean Products
University of Tennessee, Knoxville

Project Team: C. Wilt, J. Monaco, J. Geibig, A.Hite

Prepared for the UNEP Workshop for the CiP Project
16 March, 2011
Geneva, Switzerland

Overview of Presentation

- Review of sector definition
- Review of existing information landscape
- Highlights of survey findings
- Recommendations
Definition of Building and Construction Materials

Includes:

• Consumer products manufactured or processed with the intended or common end use as a component of a building or structure.

• Permanent components of buildings including fixed elements (ex., framing, sheathing, and decking)

Excludes:

• Paints, sealants, and adhesives unless used in manufacturing of another material

• Non-fixed elements such as drapery and furnishings.

Sector Definition, cont.

Also excludes:

• Materials extracted and used locally in raw form and with minimal processing
  • Example: Bamboo cured for use locally as a structural element vs. bamboo manufactured into flooring

*Note: Exception is made where known hazards are associated with locally extracted and minimally processed materials*
**Chemicals of Concern in Building Materials**

**Volatile organic compounds (VOCs)**

- Common Building Material Contents, including formaldehyde, acetaldehyde, toluene, isocyanates, xylene, benzene.
- Associated Concerns:
  - *Human Health*: Acute and Chronic - known or suspected contributors to cancer, leukemia, lymphoma, liver, kidney and nervous system damage; sick building syndrome
  - *Environment*: Photochemical reactions in atmosphere contribute to smog and global climate change

**Persistent Bioaccumulative Toxicants (PBTs)**

- Common Building Material Contents: phthalates, heavy metals, halogenated flame retardants (HFRs), perfluorochemicals (PFCs), polychlorinated biphenols (PCBs) and dioxins.
- Associated Concerns:
  - *Human Health*: known or suspected contribution to reproductive and developmental harm, chronic respiratory problems, cancer.
  - *Environment*: accumulation in rivers, lakes and streams.
Chemicals of Concern in Building Materials

- Other common chemicals/products of concern:
  - Asbestos
  - Fiberglass
  - Biocides, Pesticides, Herbicides, Fungicides
- Emerging Concerns:
  - Nanomaterials
  - Antimicrobials

Barriers to CiP Information Exchange

- Cross-referencing of product contents with disparate hazard identification and action lists.
- Differing regulatory requirements create further confusion in hazard identification lists.
- Lack for full disclosure of product specific chemical contents by manufacturers to identify potentially hazardous chemicals.
- Cross-referencing of product-specific performance and design data with CIP information.
Examples of Information Resources

Pharos (USA)

- Expanding library of building products with comparative information about material contents
- Maintains a Chemical and Material Library compiled of published, third-party hazard identification and action lists.

Pharos Chemical & Material Library
Pharos Material Contents

BASTA (Sweden)

- Maintains database of materials which **do not contain** chemicals prohibited under European Community Regulation on chemicals and their safe use (REACH)
  - Carcinogens, Mutagens, or Reproductive Toxins
  - Persistent, biaccumulative substances
  - Ozone depleting substances
  - Heavy metals, etc
- Includes numerous prioritized product groups including wood products, building materials, others
- Requires manufacturer assessment (not 3rd party) and declaration, and is audited by BASTA
**Survey Findings—Distribution of Responses**

- 52 surveys received to date, representing all geographic regions.
- 35 surveys from developed / 16 from developing countries.
- Excellent distribution across stakeholder categories
Survey Findings, cont.

- 68% of respondents report seeking/using chemical information to identify building materials meeting regulatory standards set for their region or industry sector.

- Respondents rank a “high” or “very high” priority for additional information related to “scientific data on the health impacts of materials and chemicals” and “chemical and material content of products.”

Survey Findings, cont.

- 38% of respondents report being able to find information about chemicals in specific building products. However, more than half of those respondents (54.5%) say that the information found is inadequate, and generally not specific enough.

- 77% of respondents feel that existing information systems do not provide balanced chemical information across the life-cycle stages of the product,
Survey Findings, Cont.

- Products ranked highest priority for chemicals information include:
  - interior finishing (including paints),
  - flooring,
  - structural materials (e.g. wood, metal and concrete),
  - insulation, and
  - material feedstocks/ingredients for material production.

- Indicated research priorities for chemical information include: use (occupation, performance), product/material manufacturing, and end-of-life (demolition, reuse, recycling).

Survey Findings: Needs/Constraints

- Perceived lack of data / lack of data that is specific enough;
- Available information is more germane to European and North American countries;
- Time-consuming nature of finding CiP information, particularly amidst shifting regulatory requirements at local and regional levels;
- Time-consuming nature of cross-referencing performance data with CiP data;
- Potential gaps in data from existing chemical reporting mechanisms, such as MSDSs; and
- Poor CiP information for end-of-life disposition of materials.
Recommendations

1) Leverage the Role of Green Building Standards & Certification Programs

Recommendations, cont.

2) Promote Standardized Reporting of Environmental Data
   - expansion of the use of GHS
   - “FAQs” of what stakeholders should expect from information sources such as MSDSs or EPDs
3) Support development of additional life-cycle research
   - Centralized support to “mine” past research

4) Provide ways for architects, designers and specifiers to cross-reference performance and application data with CiP information
Merci beaucoup!

For further communications:

Jack R. Geibig, jgeibig@utk.edu
or Catherine A. Wilt, catwilt@utk.edu