

PERSPECTIVES: REPORTING ON BIOCHEMICAL OPPORTUNITIES

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Red List Material Report



The EcoAmmo Family



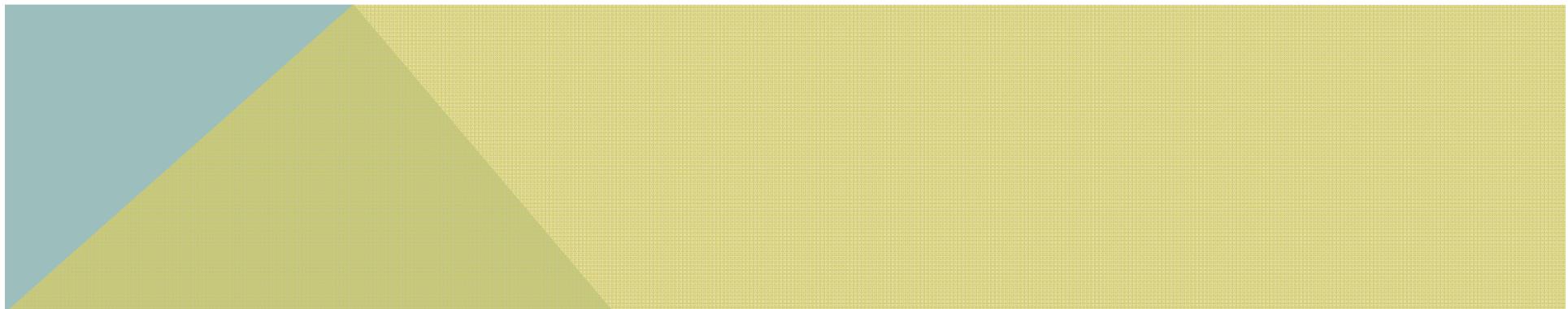
2006



2014

We arm our clients with knowledge,
to assist construction projects and
business operations transition towards
sustainability.

Some Of Our Clients





First Living Building Challenge Petal Certification &
LEED Platinum Targeted Commercial Building in Alberta



www.themosaiccentre.ca

OUTCOMES & DELIVERABLES FOR THIS REPORT

Primary Focus

- Provide a list of products that are the most challenging to source, and are high in volume and in most demand.
- Identify any perceived market opportunities to grow the agricultural sector in Alberta and meet Red List requirements.

Secondary Focus

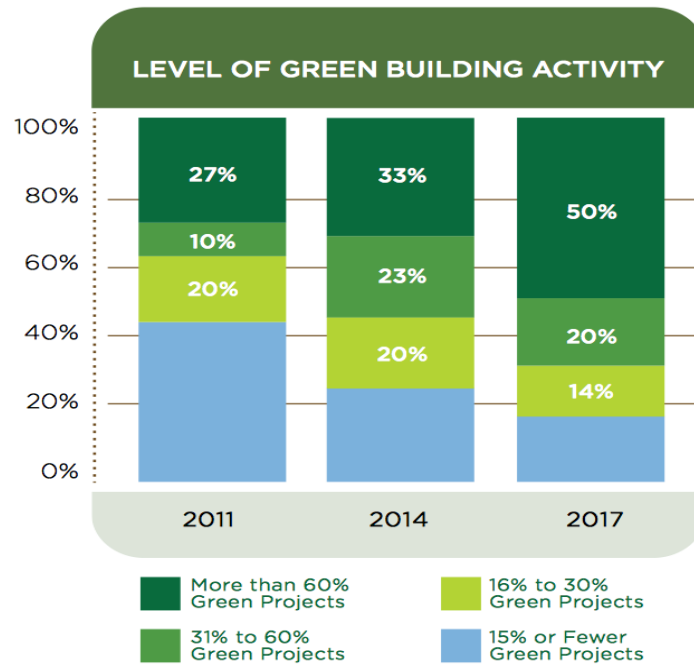
- Provide overview of drivers for recent Red List interest in Alberta.
- Provide a list of sectors and professionals requesting Red List compliant materials.



The Growing Green Building Market

GREEN BUILDING ACTIVITY IN CANADA

Well over half (56%) of the Canadian respondents to the industry survey report that over 30% of the projects they build are currently green, and by 2017, 70% expect to be doing at least that level of green construction, with 50% reporting that more than 60% of their projects will be green. This suggests that the share of green building in Canada's construction market is likely to see significant increases, creating strong opportunities for firms in this market that can capitalize effectively on this shift.



The Growing Green Building Market



2012 World Green Building Trends study conducted by McGraw Hill Construction, suggests that the Canadian market may soon be on par with the U.S. in terms of the share of green building.



The Growing Green Building Market

The majority of Green Building Certifications on the market today involve a component of healthy & environmentally conscious product and material selection.



LIVING
BUILDING
CHALLENGESM



...Green and
Responsible



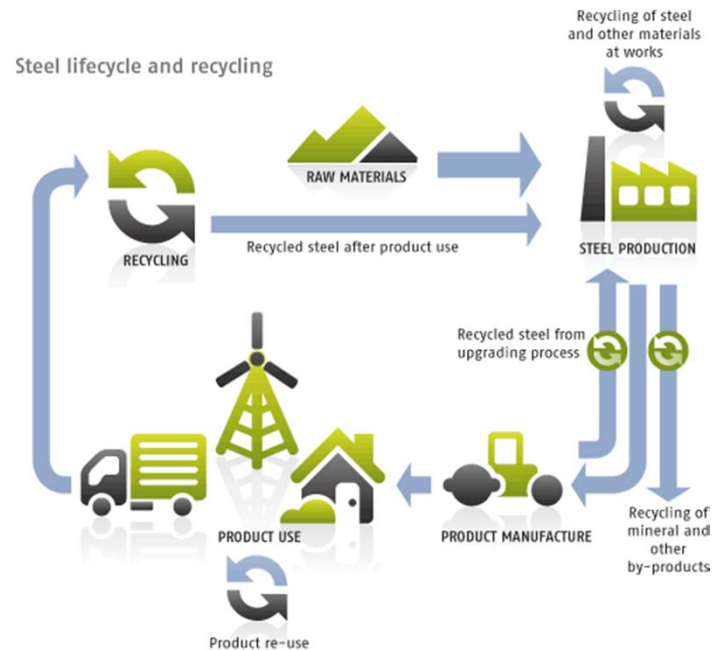
Chemicals & Materials in Green Building Rating Systems

- Green Building Rating Systems heavily rely on sections such as Material & Resources, and Indoor Environmental Quality to achieve certification
- Chemicals & materials influence these sections because they are directly connected to:
 - Adhesives & Sealants;
 - Paints & Coatings;
 - Flooring Systems;
 - Composite Wood & Agrifiber Products;
 - Indoor Chemical & Pollutant Source Control
 - Recycled Content
 - Regional Materials
 - Rapidly Renewables Materials
 - Certified Woods/Appropriate Sourcing
 - Green Cleaning products



Chemicals & Materials in Green Building Rating Systems

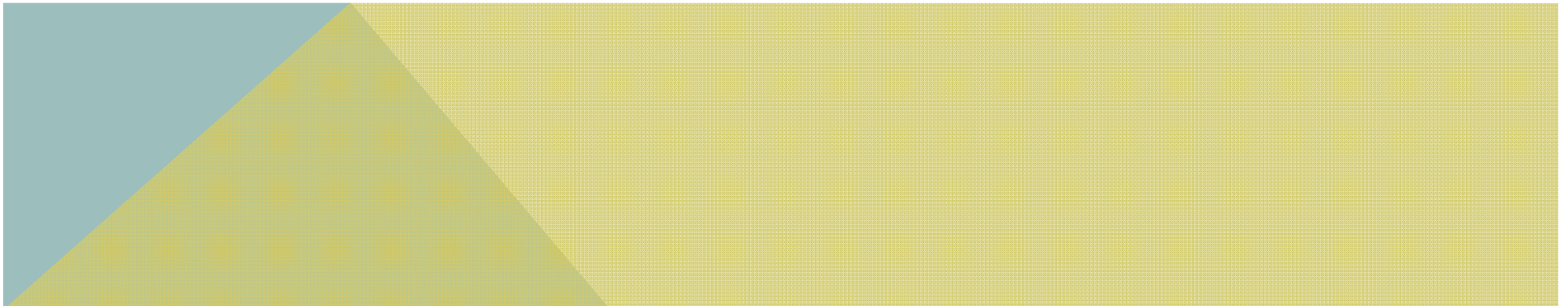
Specific Materials → Specific chemicals & Life Cycle Assessment





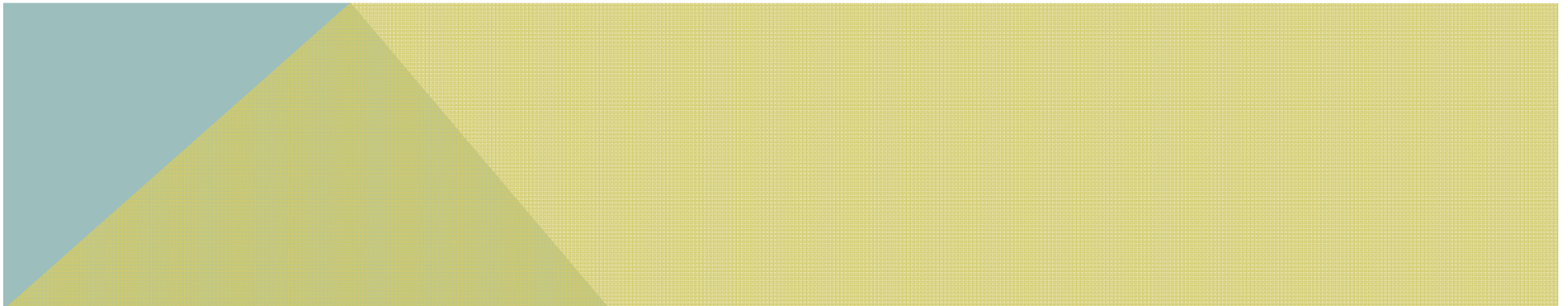
“Define the most advanced measure of sustainability in the built environment possible today and diminish the gap between current limits and ideal solutions.”

- Living Future Institute



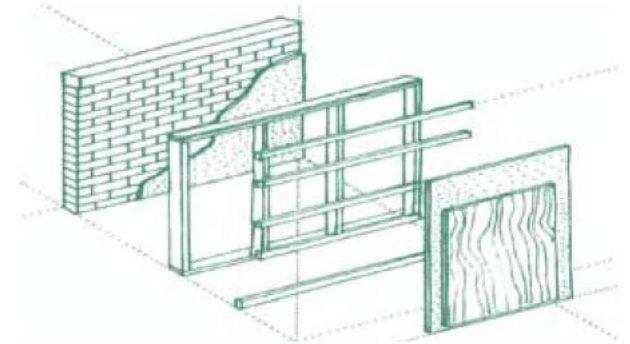
Living Building Challenge & Materials **Red** List

- Developed to identify chemicals and materials that have negative impacts on human and ecological health within buildings, and to push for change to eliminate them



Red List

1. Asbestos
2. Cadmium
3. Chlorinated Polyethylene and Chlorosulfonated Polyethylene
4. Chlorofluorocarbons (CFCs)
5. Chloroprene (Neoprene)
6. Formaldehyde (added)
7. Halogenated Flame Retardants
8. Hydrochlorofluorocarbons (HCFCs)
9. Lead (added)
10. Mercury
11. Petrochemical Fertilizers and Pesticides
12. Phthalates
13. Polyvinyl Chloride (PVC)
14. Wood treatments containing Creosote, Arsenic or Pentachlorophenol [1]



MATERIALS

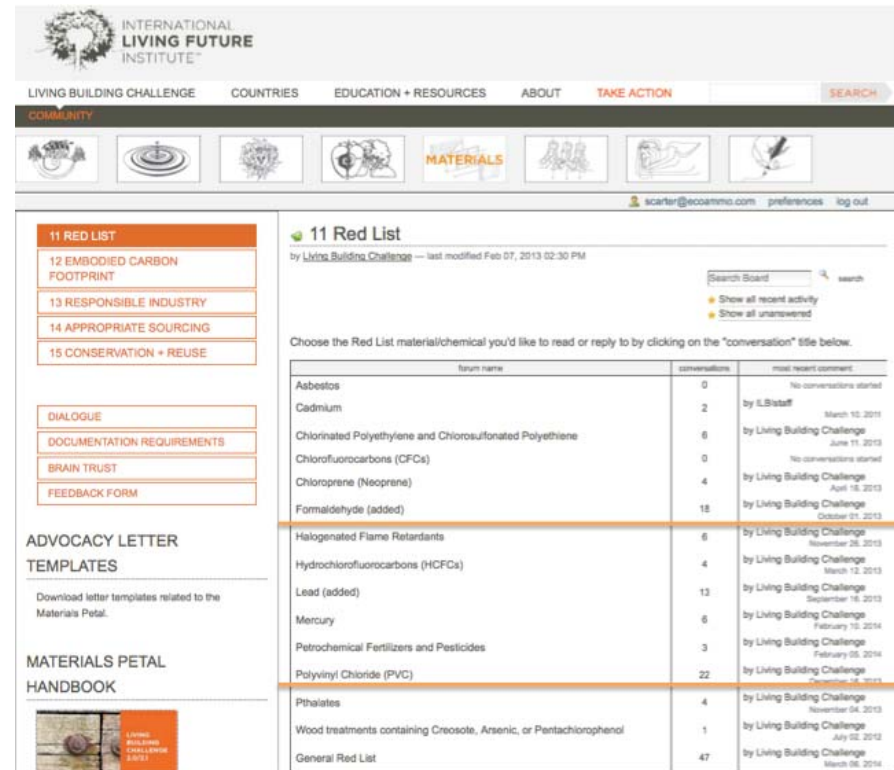
ENDORISING PRODUCTS AND
PROCESSES THAT ARE SAFE FOR
ALL SPECIES THROUGH TIME



Most Challenging To Source

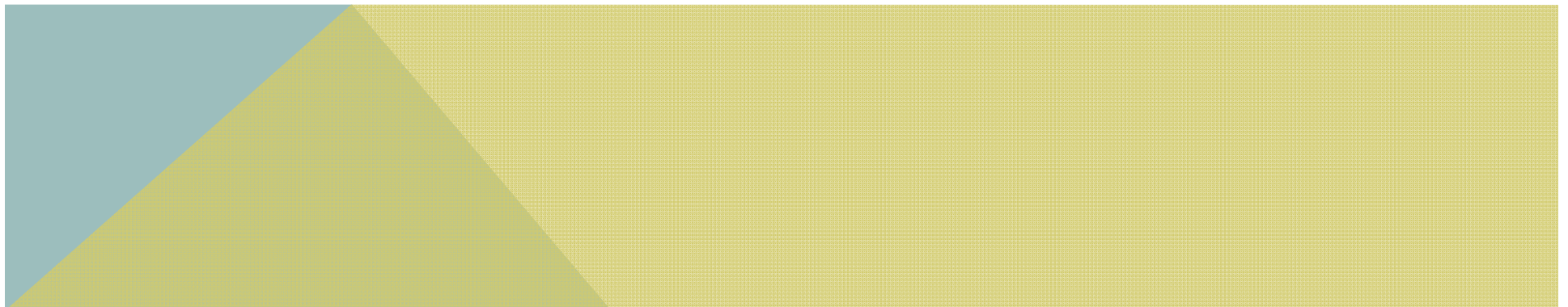
TOP 3

- **Formaldehyde (added)**
- **Polyvinyl Chloride (PVC)**
- **Halogenated Flame Retardants (HFR)**



The screenshot shows the International Living Future Institute website. The main navigation bar includes 'LIVING BUILDING CHALLENGE', 'COUNTRIES', 'EDUCATION + RESOURCES', 'ABOUT', 'TAKE ACTION', and a 'SEARCH' button. Below this is a 'COMMUNITY' section with icons for various topics. The main content area is titled '11 Red List' and features a table of materials with columns for 'forum name', 'conversations', and 'most recent comment'. The table lists 11 materials, with 'Formaldehyde (added)', 'Polyvinyl Chloride (PVC)', and 'Halogenated Flame Retardants' highlighted in orange. The 'General Red List' has the highest number of conversations at 47.

forum name	conversations	most recent comment
Asbestos	0	No conversations started
Cadmium	2	by E.Boatell March 10, 2013
Chlorinated Polyethylene and Chlorosulfonated Polyethylene	6	by Living Building Challenge June 21, 2013
Chlorofluorocarbons (CFCs)	0	No conversations started
Chloroprene (Neoprene)	4	by Living Building Challenge April 18, 2013
Formaldehyde (added)	18	by Living Building Challenge October 01, 2013
Halogenated Flame Retardants	6	by Living Building Challenge November 28, 2013
Hydrochlorofluorocarbons (HCFCs)	4	by Living Building Challenge March 12, 2013
Lead (added)	13	by Living Building Challenge September 16, 2013
Mercury	6	by Living Building Challenge February 10, 2014
Petrochemical Fertilizers and Pesticides	3	by Living Building Challenge February 05, 2014
Polyvinyl Chloride (PVC)	22	by Living Building Challenge September 24, 2013
Phthalates	4	by Living Building Challenge November 04, 2013
Wood treatments containing Creosote, Arsenic, or Pentachlorophenol	1	by Living Building Challenge July 02, 2012
General Red List	47	by Living Building Challenge March 06, 2014



Most Challenging To Source

Currently over 35 variations of 'formaldehyde' currently listed by CAS RN.

Formaldehyde (added)

Found in a variety of materials, including but not limited to:

Ceiling tiles

Wall coverings

Millwork

Interior Doors,

Countertops

Glulam finger joints

Composite wood panels

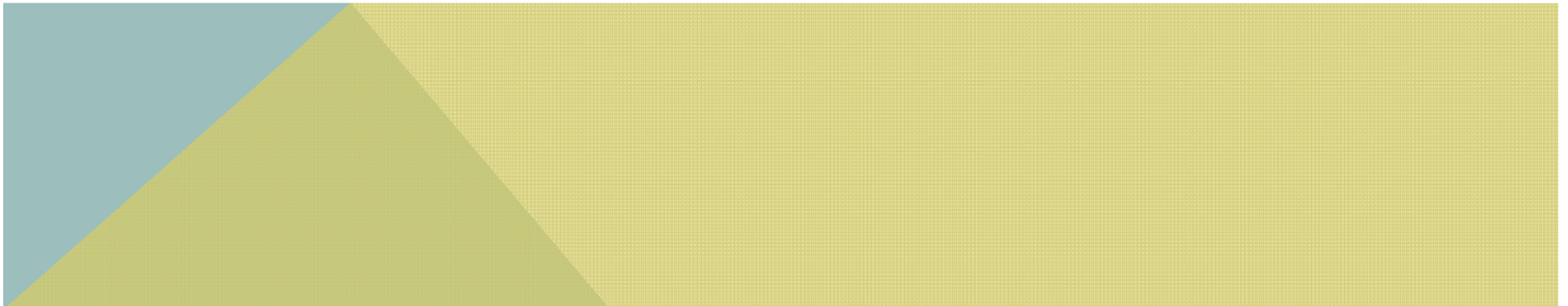
Flooring

Furniture

Adhesives

at exterior gypsum sheathing

concrete air entraining agents



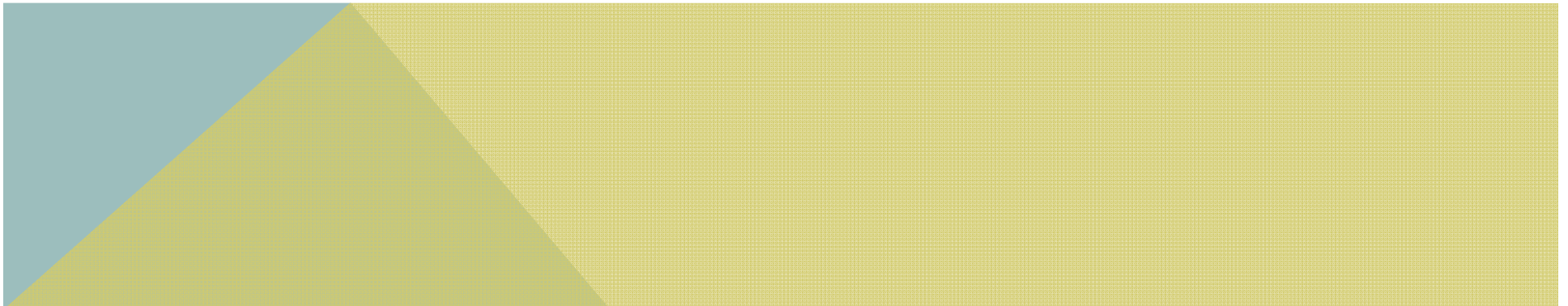
Most Challenging To Source

Polyvinyl Chloride (PVC)

Found in a variety of materials, including but not limited to:



- Roofing
- Siding
- Wall coverings
- Flooring
- Windows
- Window coverings
- Wiring (electrical & data)
- Furniture
- Millwork
- Signage
- textiles



Most Challenging To Source

Halogenated Flame Retardants (HFR)

These chemicals slow, not stop, combustion, and are found in:



most upholstery

commercial textiles

plastics

foams

Insulation

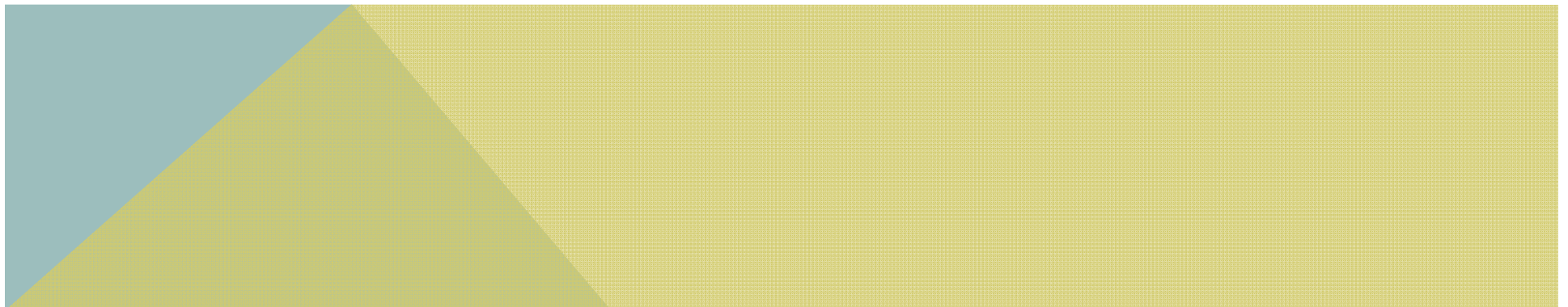
flooring underlay/ padding/ backing

epoxy and resins

housing paints

kitchen appliances

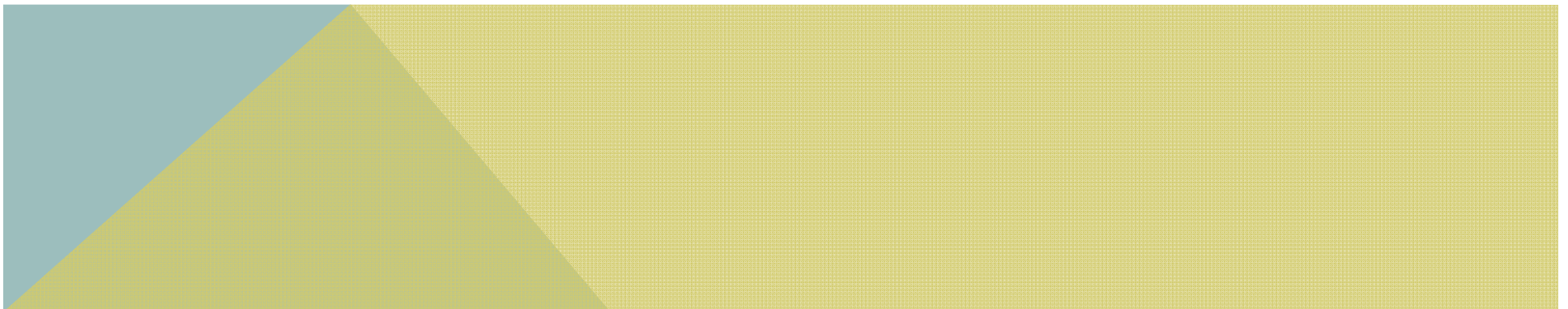
electrical devices



Red List Opportunities In Alberta

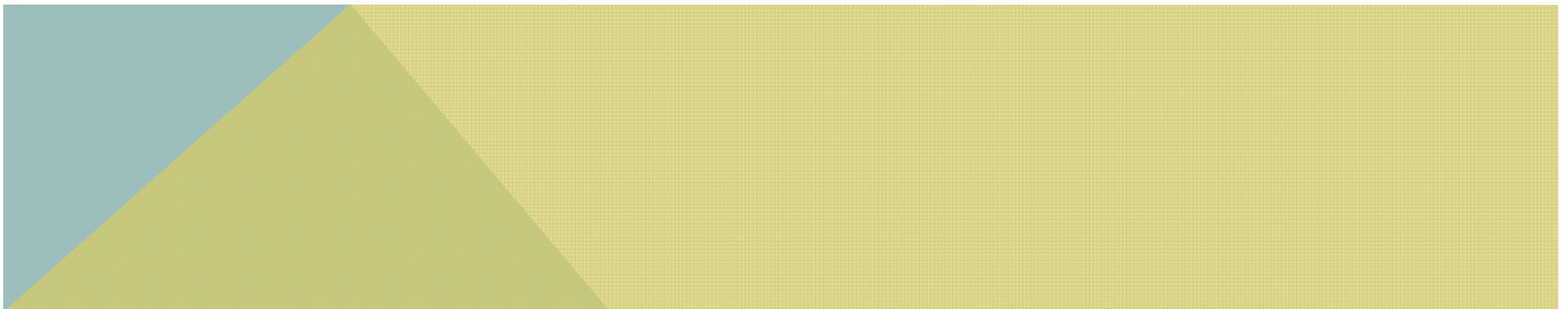
The Significant Market Gap

- Growing list of government departments and private sector mandating LEED or other green building rating systems for new buildings.
 - Google Healthy Materials Program
- Growing interest in LBC and Red List regionally since a major presentation at the Alberta Sustainable Building Symposium
- Advocacy letters to manufacturers
- \$42.5B chemical market in Canada, how can we incorporate bio-based alternatives and continue to increase that market?



Google's Shared Lessons

- **Avoiding formaldehyde**
 - “There are alternatives, but they are much more expensive,” notes Anthony Ravitz, green team lead for Google’s Real Estate and Workplace Services group.
 - Furniture is a challenging category, mostly because there are so many components.
 - Formaldehyde is common in work surfaces—in the laminates, adhesives, and substrates. And upholstered furniture has flame retardants, which California requires for fire safety (at least by some interpretations).
- **Duct liner** “We were surprised to discover a lot of chemicals of concern,” says Less, “which is troubling because the air we breathe goes through that material.” Formaldehyde, flame retardants, and heavy metals are among the substances that turned up in their review of product formulations.
- **Fabric window shades** Almost all have flame retardants, but fabrics on workstations can be specified without flame retardants or stain-resistant coatings as long as the manufacturer applies those coatings after weaving the fabric rather than before.



Mosaic's Shared Lessons

Products & Materials Difficult to find RED LIST compliant:

Grouts

Joint compound

Adhesives

Sealants

Insulation

Gypsum

Aluminum curtain Wall & door frames

Wood filler

Stain

Clear Coatings

Roller shades

Plumbing fixtures

Plumbing fittings, tubes, & gauges

Variable frequency drives

BTU meter

Pumps

Wiring, lighting controls, meters,

Floor boxes

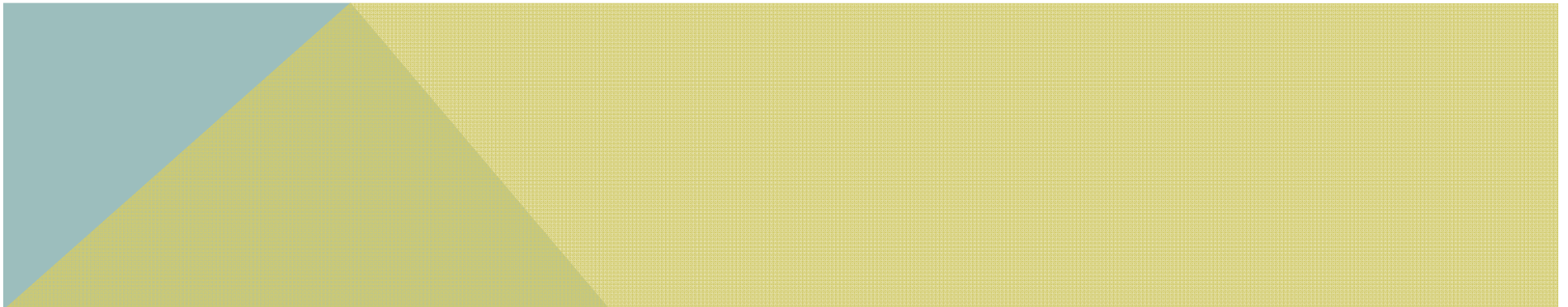
Occupancy sensors

Receptacles, switches & covers

Lighting fixtures

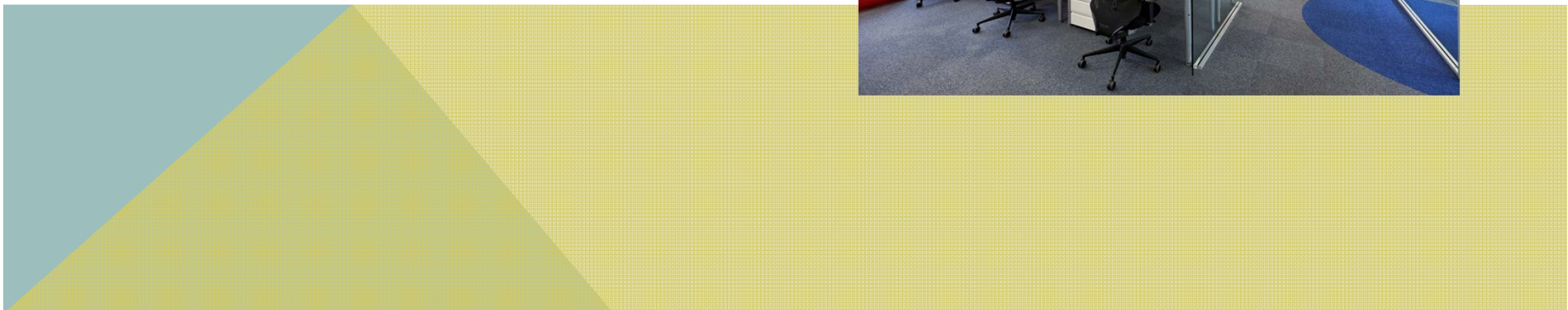
Styrofoam

Solar inverters



5 Years Ahead...

- Google as a leading example
- Collaboration between Alberta Agriculture & Rural Development and local manufacturers to develop alternatives during time of transition
- Start now to get ahead of the market





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RELOAD WITH ECOAMMO
WWW.ECOAMMO.COM

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