Copper Development Association
Copper Alliance

Update of regulatory issues that concern and affect copper and copper alloys

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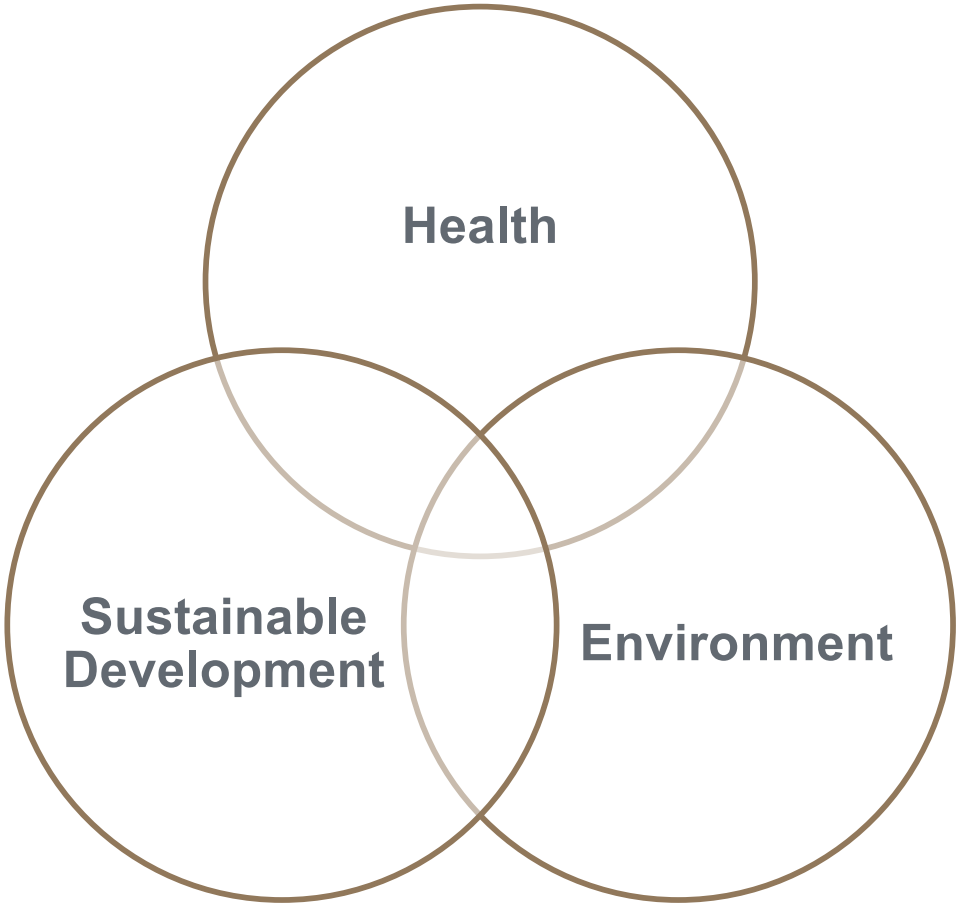
3 April 2019

Issues



Regulatory & Non-regulatory

Risks & Opportunities

Primarily North American

Prioritizing

Cu

Impact

- Geographic scope
- Operating cost impact ($M)
- Market impact (kt Cu)
- Reputation impact

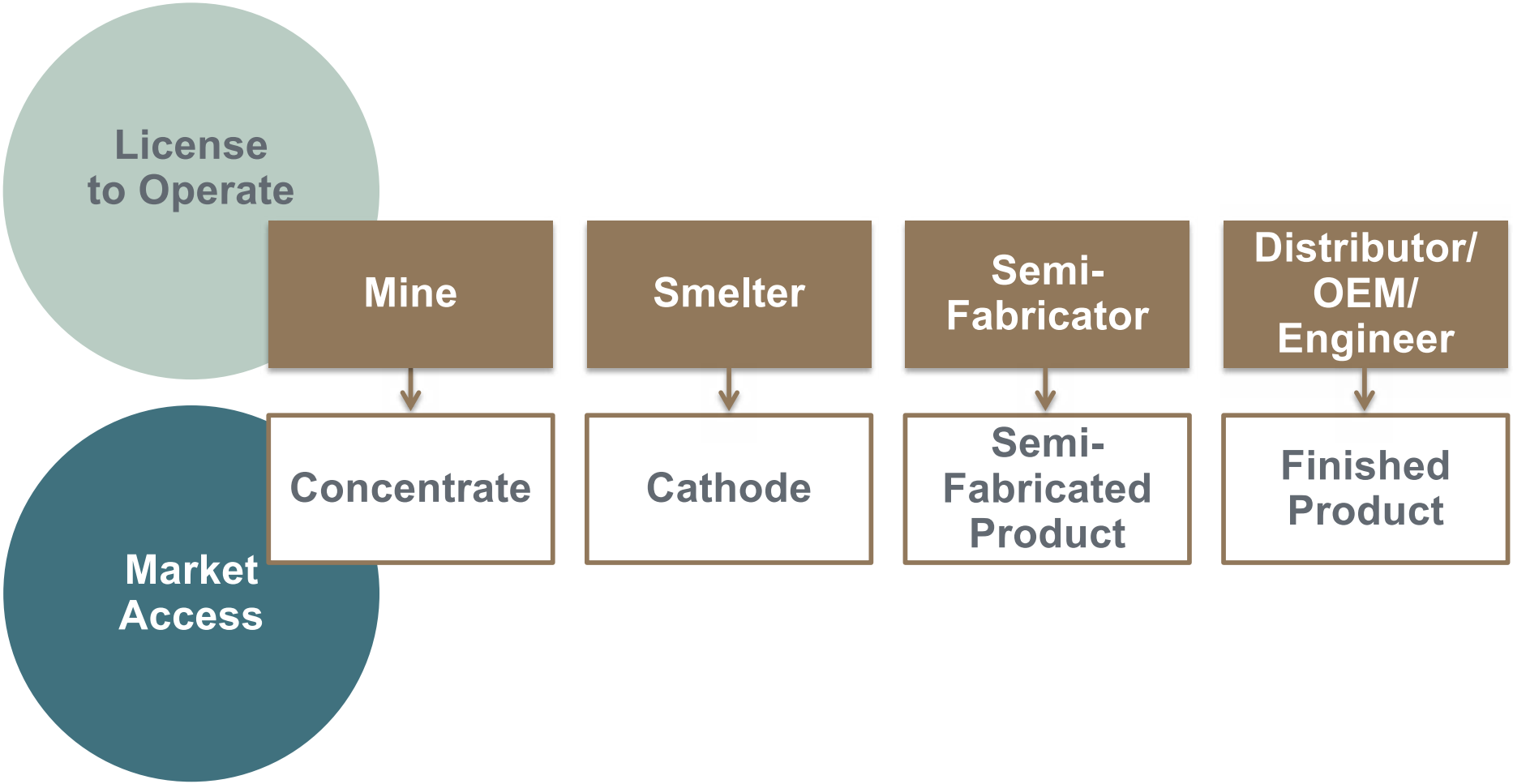
Urgency

- Probability of occurrence (%)
- Time to impact
- Industry scope
- Ability to influence

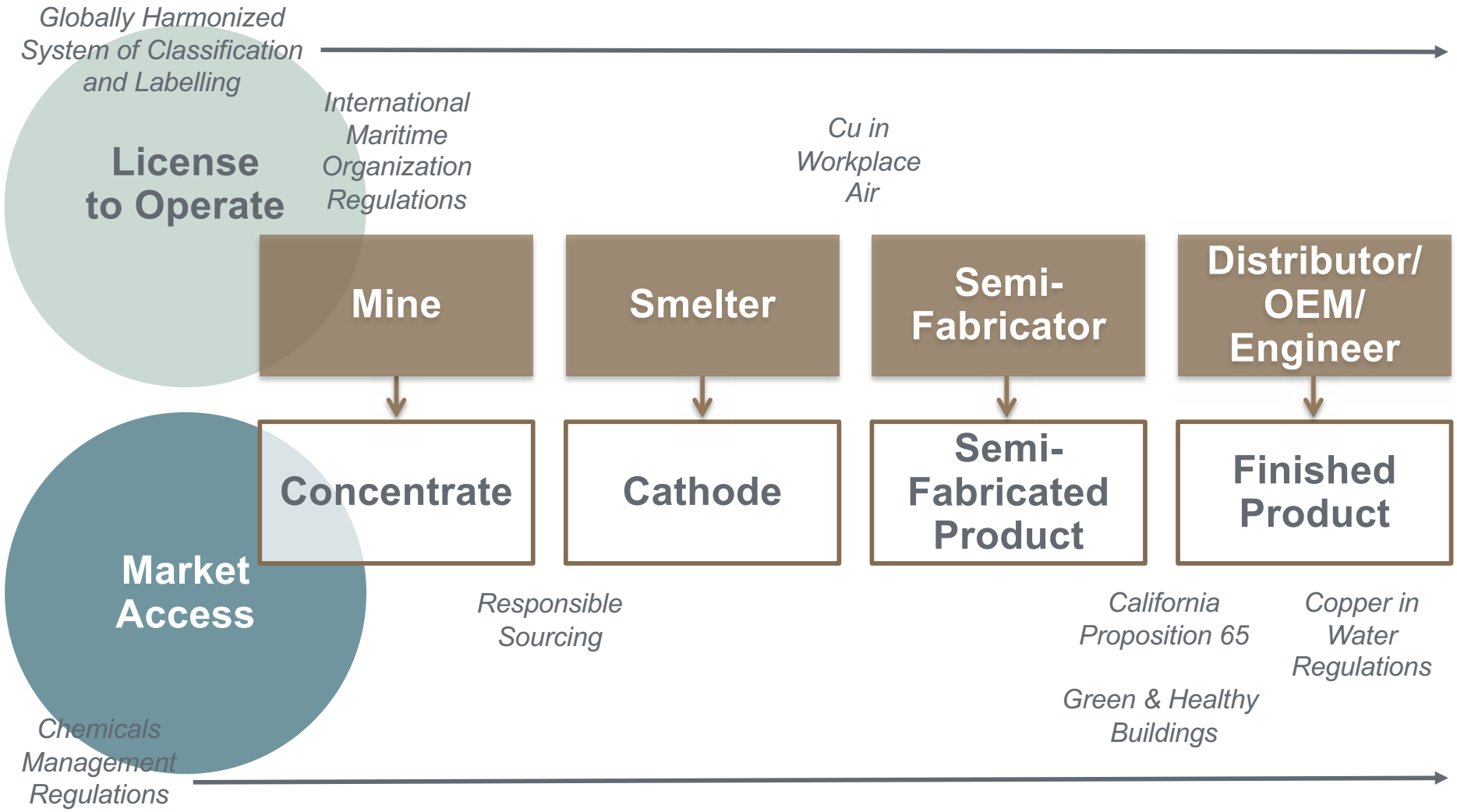
Critical:	**Immediate action and significant resources**
High:	**Action and resources required**
Moderate:	**Monitor and small amount of resources**
Low:	**Acceptance and little to no resources**

Impacts

Cu


License to Operate
Market Access
Mine
Smelter
Semi-Fabricator
Distributor/ OEM/ Engineer
Concentrate
Cathode
Semi-Fabricated Product
Finished Product

Agenda


Globally Harmonized System of Classification and Labelling
License to Operate
International Maritime Organization Regulations
Cu in Workplace Air
Mine
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Concentrate
Cathode
Semi-Fabricated Product
Finished Product
Market Access
Responsible Sourcing
California Proposition 65
Copper in Water Regulations
Green & Healthy Buildings
Chemicals Management Regulations

Issues Affecting Market Access

Market Access: Chemicals Management Regulations

Cu

🇺🇸 United States Environmental Protection Agency (EPA): *Toxic Substances Control Act (TSCA)*

- Major overhaul in 2016
- Requires EPA to consider metals differently than organics
- Other metals likely to be assessed before Cu
  - Mo, Sb, Cd, Co, Pb, Hg, Ni
- When assessed, $1.3M industry fee
  - Formation of consortium will be required

🇨🇦 Environment and Climate Change Canada (ECCC), Health Canada (HC): *Chemicals Management Plan (CMP)*

- Cu and its compounds currently being assessed (along with Zn)
- Decision expected in Q2/Q3 2019
  - If “CEPA toxic”, risk management measures will be proposed
- Copper Alliance formed broad taskforce in 2017
  - Significant engagement with assessment team & other stakeholders

High

Market Access: Chemicals Management Regulations (cont.)

Cu

European Chemicals Agency: *Registration, Evaluation, Authorisation & Restriction of Chemicals (REACH)*

- Pb proposed as “Substance of Very High Concern” (SVHC) in June 2018
  - Triggered immediate communication obligations
  - Initiated prioritisation for authorisation
    - Cannot be used on its own or in alloys, above specific concentration limit, after sunset date (~Q3/4 2024), unless authorisation granted
- Copper Alliance strategy & tactics
  - Delay prioritization
    - Prepare dossier to support advocacy (starting in September 2019)
  - Evaluate precedents for restriction and other alternatives to authorisation
    - Obtain exemption for use(s) of Pb in Cu alloys for drinking water applications
  - Obtain suitable latest application date for authorisation

Moderate

Market Access: Responsible Sourcing

Cu

Electronic & automotive companies

Financial investors & banks

ABN·AMRO

Non-Governmental Organizations

AMNESTY INTERNATIONAL

global witness

Regulatory agencies

OECD

European Commission

LONDON METAL EXCHANGE

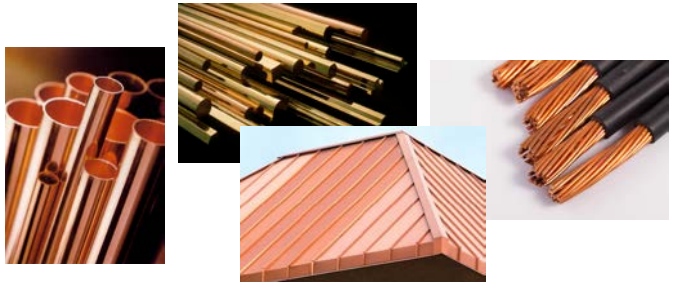
Market Access: Responsible Sourcing (cont.)

Some (not all!) components of responsible sourcing

Copper Alliance developing strategy to address concerns

- Designed to demonstrate responsible production
- Stay tuned . . .

Market Access: California Proposition 65



California Office of Environmental Health Hazard Assessment: *Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65)*

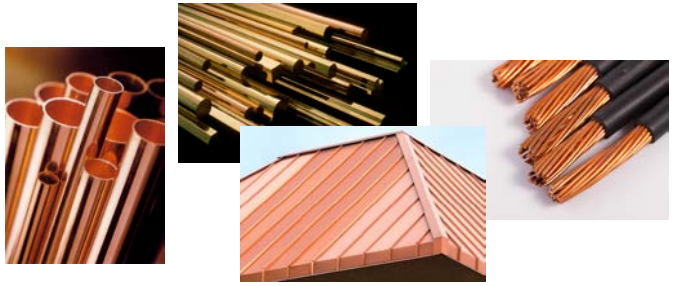
- Requires "clear and reasonable" warning if use of product may result in exposure to certain chemicals above Safe Harbor Limit (µg/day)
  - Deals with exposure to chemicals, not chemical content

WARNING: This product can expose you to [lead], which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

- Enforcement: public via Attorney General, private via citizen suits
  - Companies often pay settlements to avoid expense of litigation
    - Settlement agreements can be used as a guide
      - Lead in brass: Reformulate so product contains ≤100 ppm (0.01%) lead

High

Market Access: California Proposition 65 (cont.)

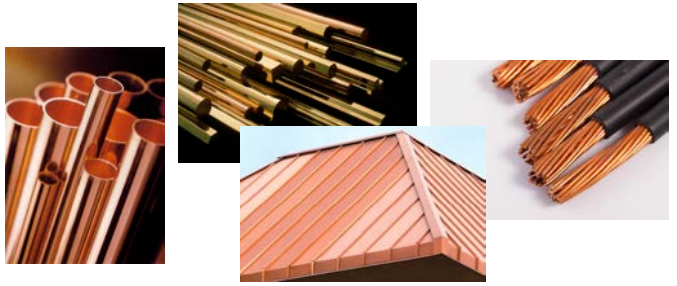


Key elements identified in 2019 Copper Alliance guidance:

Class	Arsenic	Beryllium	Cadmium	Lead	Mercury	Nickel
Cast Alloys						
Brasses	X	X	X	X		X
Bronzes				X		X
Copper-Lead Alloys				X		X
Copper-Nickels		X		X		X
Coppers	X	X				
High Copper Alloys		X		X		X
Nickel Silvers				X		X
Special Alloys				X		X
Wrought Alloys						
Brasses	X		X	X		X
Bronzes	X			X		X
Copper-Nickel Alloys		X		X	X	X
Nickel Silvers				X		X
Coppers	X		X	X		X
High Copper Alloys	X	X	X	X		X

Other elements to consider:

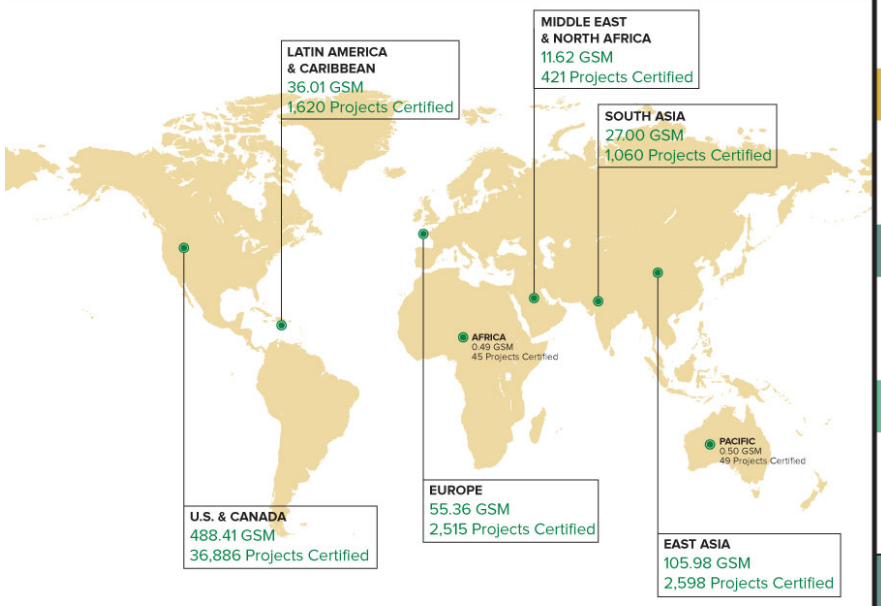
Market Access: Green and Healthy Buildings



Cu

TOP 10 COUNTRIES & REGIONS FOR LEED OUTSIDE THE U.S.

MEASURED IN GROSS SQUARE METERS (GSM)



THE RANKINGS

	CERTIFIED GSM	PROJECTS CERTIFIED
1. MAINLAND CHINA	68.83	1,494
2. CANADA	46.81	3,254
3. INDIA	24.81	899
4. BRAZIL	16.74	531
5. REPUBLIC OF KOREA	12.15	143
6. TURKEY	10.90	337
7. GERMANY	8.47	327
8. MEXICO	8.41	370
9. CHINA, TAIWAN	7.30	144
10. SPAIN	5.81	299
UNITED STATES	441.60	33,632

Gross square meters (GSM) are reported in millions.
AS OF DECEMBER 2018

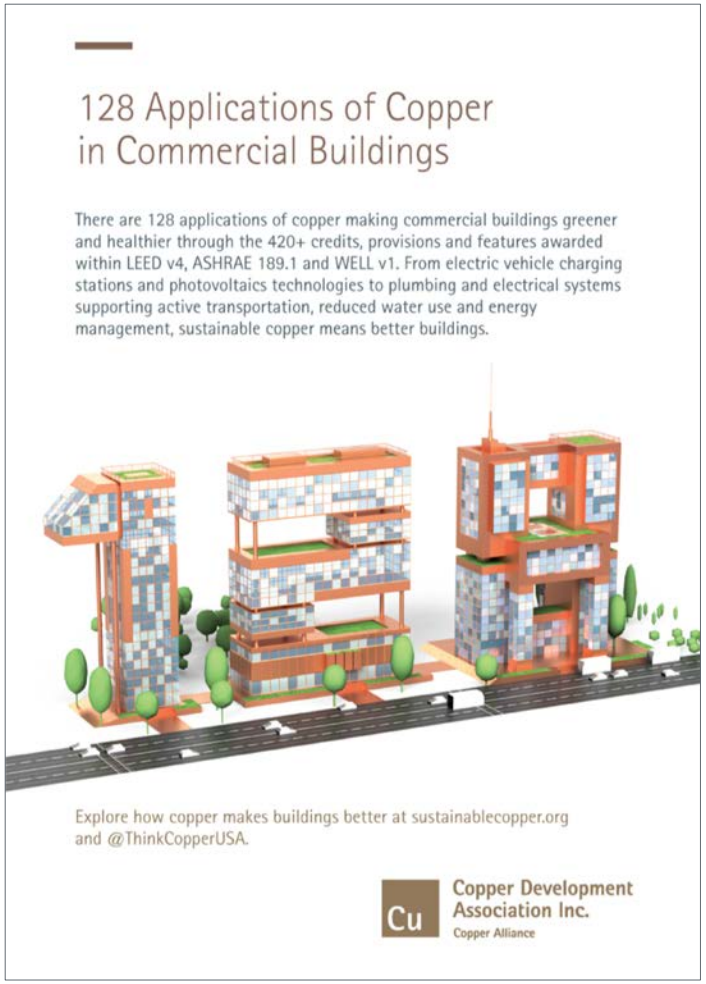
Market Access: Green and Healthy Buildings (cont.)

Several competing building and product certification schemes

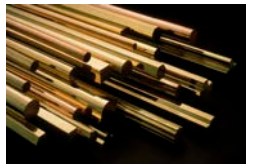
- Common theme: transparency
  - Material ingredients
  - Potential health hazards
  - Environmental impacts
- Next frontier: optimization

Building Better: A Guide to Copper in Green and Healthy Buildings

- Published by Copper Alliance in 2018
- Establishes strong connection between copper and green and healthy buildings via credit-application pairs



Market Access: Copper in *Drinking Water* Regulations

Cu

EPA: *Lead and Copper Rule*

- Update still pending
- Expected to include:
  - No change to Cu Action Level = 1.3 mg/L
  - New “aggressive to copper” criteria
    - To be evaluated by Copper Alliance
  - New health-based benchmark for Pb

HC: *Drinking Water Guidelines*

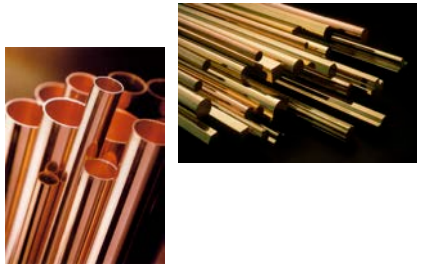
- New Cu guideline proposed in 2018
  - Maximum Acceptable Concentration (MAC) = 2 mg/L at tap
  - Aesthetic objective = 1 mg/L at tap
- New Pb guideline finalized in March 2019
  - MAC = 5 µg/L

EU: *Drinking Water Directive*

- Recast in 2018
- No change to Cu limit
- New Pb limit proposed = 5 µg/L
- Potential to affect alloys previously tested under 4MS scheme
- Implementation into national laws not expected until ~2029

Moderate/Low

Market Access: Copper in *Surface Water* Regulations



Cu

- Federal and State/Provincial regulations that establish allowable levels of copper in surface waters
- Impacts market access for architectural and plumbing products and license to operate for facilities with discharge permits

🇺🇸 EPA: *Cooperative Research and Development Agreement*

- Copper Alliance & Al, Co, Pb, Ni, Zn associations signed in 2017
- 5 year project
- Establish methods for deriving bioavailability-based water quality criteria for metals

🇨🇦 ECCC: *Water Quality Guideline*

- Update for Cu expected in Q2/Q3 2019
- Linked to CMP assessment
- Based on same science used by EPA and preferred by Copper Alliance (bioavailability)

High

Market Access: Copper in *Stormwater* Regulations

Cu

EPA: *Multi-Sector General Permit (MSGP)*

- Establishes stormwater discharge requirements, replicated in State permits
- Impacts market access for architectural products and license to operate for facilities with stormwater permits

2015
- MSGP revision
- Metals industry comments not considered

2016
- Settlement agreement from EPA lawsuit requires National Academy of Science (NAS) study on improving MGSP

2017
- NAS panel formed

2018
- Advocacy with International Zinc Association to NAS panel and EPA

2019
- NAS recommendations mirror advocacy position
- *Continued outreach to EPA*

2020
- *MSGP revision expected*

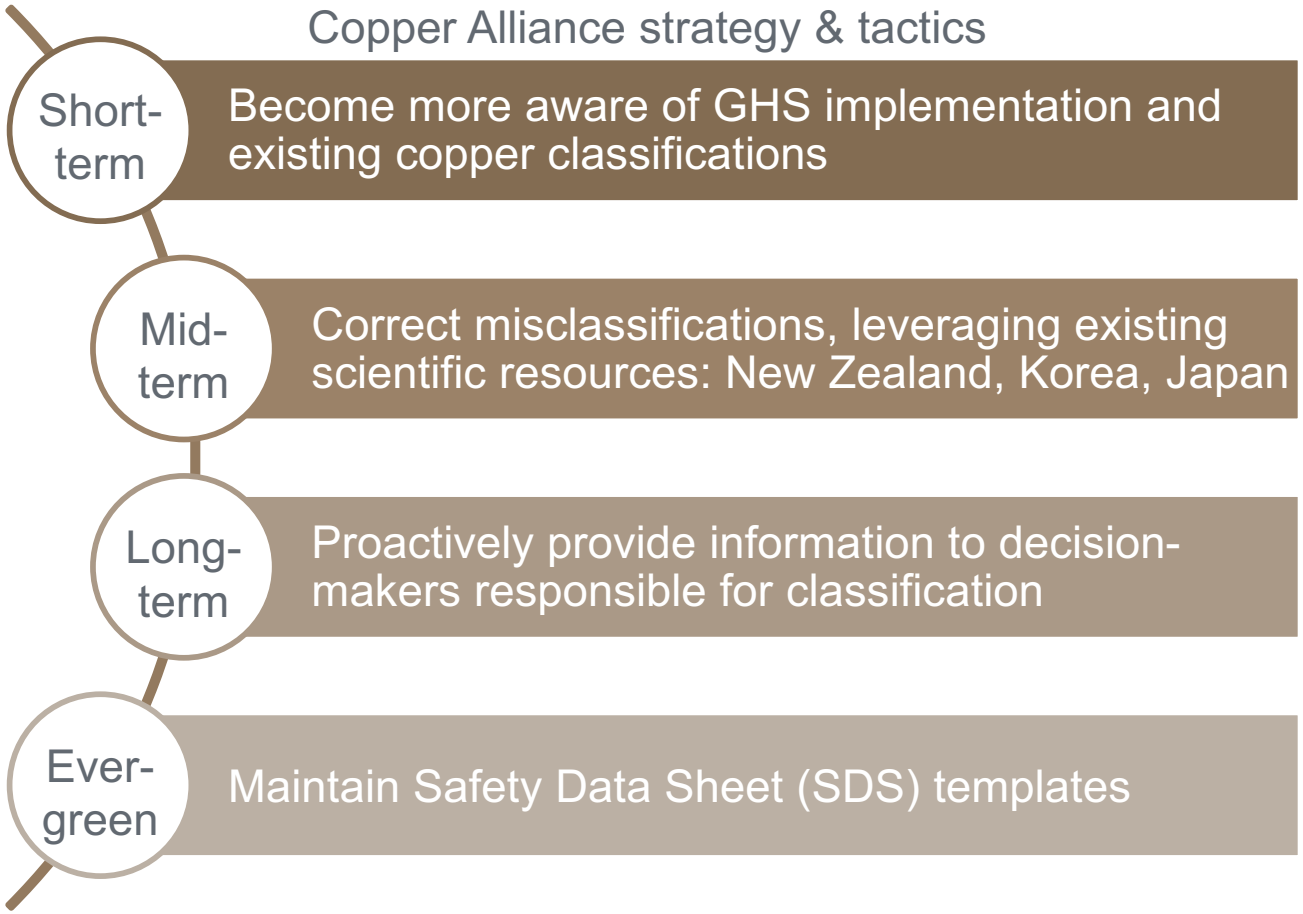
Low

Issues Affecting License to Operate

License to Operate: Globally Harmonized System of Classification and Labelling (GHS)

United Nations:
GHS

- *Intended* to harmonize hazard identification and communication, globally
- Exploring global classifications list



GHS = Classification, Labelling & Packaging (CLP) in EU, with important links to REACH. Co classification as carcinogenic may trigger similar process as Pb.

Critical

License to Operate: Cu in Workplace Air

Cu

🇪🇺 European Commission Scientific Committee on Occupational Exposure Limits (SCOEL): *Occupational Exposure Limit (OEL)*

- Proposed to reduce Cu OEL 100X in 2014 = 0.01 mg/m^3
- Several other EU countries considering similar changes
- Copper Alliance assembled expert panel to recommend research and advocacy needed to resolve uncertainty
  - Implementing tiered plan
  - Authorities delayed until complete

🇨🇦 🇺🇸 American Conference of Governmental Industrial Hygienists (ACGIH): *Threshold Limit Value*

- Cu on "Under Study List"
  - No action until at least 2020
- Copper Allaince preparing proactive data submittal to inform decision-making
  - Research underway in EU may support further delay

Critical

License to Operate: International Maritime Organization (IMO) Regulations

Cu

IMO: *International Maritime Solid Bulk Cargo (IMSBC) Code*

- New criteria established in 2015 required hazard assessment of cargoes
  - Problematic test method for corrosivity
    - All copper concentrates → "corrosive"
      - Increased freight rates & reduced access to port facilities
- Copper Alliance lead mining industry collaboration to propose refinements to test
  - Accepted "in principle" by IMO in Q3/4 2018
  - Final decision in 2019

Successfully secured

ANNUAL COST AVOIDANCE OF MORE THAN $140M

for members by refining and successfully advocating for a corrosivity test method to meet IMO regulations

Moderate

Other Issues?

Cu

Critical

- EPA Integrated Risk Information System (IRIS)

High

- Brass scrap stream viability

Moderate

- Regulatory reform
- Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profile for Cu
- Architectural Cu runoff regulations
- Cooling tower regulations for *Legionella* monitoring
- Dodd-Frank
- End of Life Vehicles (ELV)/Restriction of Hazardous Substances (RoHS) regulations
- Environmental effects of metals mixtures

Low

- California Environmental Contaminant Biomonitoring Program
- Climate change policies
- Green chemistry regulations
- Impacts of Cu on fish olfaction
- Regulations on Cu in brake pads


Questions?

Thank you

For more information please contact:

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