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

Carrie Claytor | Director of Health, Environment, and Sustainable Development | Copper Development Association
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Issues

Health

Sustainable Development

Environment

Regulatory & Non-regulatory

Risks & Opportunities

Primarily North American
## Prioritizing

<table>
<thead>
<tr>
<th>Impact</th>
<th>Urgency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic scope</td>
<td>Probability of occurrence (%)</td>
</tr>
<tr>
<td>Operating cost impact ($M)</td>
<td>Time to impact</td>
</tr>
<tr>
<td>Market impact (kt Cu)</td>
<td>Industry scope</td>
</tr>
<tr>
<td>Reputation impact</td>
<td>Ability to influence</td>
</tr>
</tbody>
</table>

### Critical: Immediate action and significant resources
- 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

License to Operate

Market Access

Mine

Smelter

Semi-Fabricator

Distributor/ OEM/ Engineer

Concentrate

Cathode

Semi-Fabricated Product

Finished Product
Agenda

- License to Operate
  - Market Access
    - Chemicals Management Regulations
  - Global Harmonized System of Classification and Labelling
- International Maritime Organization Regulations
- Cu in Workplace Air

- Mine
  - Concentrate
  - Responsible Sourcing
- Smelter
  - Cathode
- Semi-Fabricator
  - Semi-Fabricated Product
- Distributor/OEM/Engineer
  - Finished Product

- California Proposition 65
- Green & Healthy Buildings
- Copper in Water Regulations
Issues Affecting Market Access
Market Access: Chemicals Management Regulations

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
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
Market Access: Responsible Sourcing

Electronic & automotive companies

Financial investors & banks

Non-Governmental Organizations

Regulatory agencies

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 . . .
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](http://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
## Market Access: California Proposition 65 (cont.)

### Key elements identified in 2019 Copper Alliance guidance:

<table>
<thead>
<tr>
<th>Class</th>
<th>Arsenic</th>
<th>Beryllium</th>
<th>Cadmium</th>
<th>Lead</th>
<th>Mercury</th>
<th>Nickel</th>
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<tr>
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### Other elements to consider:

- Antimony: 121.76
- Cobalt: 58.93
- Lithium: 6.94
- Selenium: 78.96
- Titanium: 47.97
# Market Access: Green and Healthy Buildings

## Top 10 Countries & Regions for LEED Outside the U.S.

<table>
<thead>
<tr>
<th>Region</th>
<th>Certified G3M</th>
<th>Projects Certified</th>
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<tbody>
<tr>
<td>Mainland China</td>
<td>68.83</td>
<td>1,494</td>
</tr>
<tr>
<td>Canada</td>
<td>46.81</td>
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<tr>
<td>India</td>
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<td>899</td>
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<td>Brazil</td>
<td>16.74</td>
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<td>Republic of Korea</td>
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<td>United States</td>
<td>11.62</td>
<td>421 Projects Certified</td>
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<tr>
<td>South Asia</td>
<td>27.00</td>
<td>1060 Projects Certified</td>
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<tr>
<td>Middle East &amp; North Africa</td>
<td>36.01 G3M</td>
<td>4,620 Projects Certified</td>
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<td>Latin America</td>
<td>48.41 G3M</td>
<td>36,086 Projects Certified</td>
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<td>Europe</td>
<td>59.36 G3M</td>
<td>2,515 Projects Certified</td>
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<td>E3 Asia</td>
<td>8.41</td>
<td>370</td>
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<tr>
<td>China, Taiwan</td>
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<tr>
<td>Spain</td>
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<td>Turkey</td>
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<tr>
<td>Germany</td>
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<td>327</td>
</tr>
<tr>
<td>Mexico</td>
<td>8.41</td>
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*LEED stands for Leadership in Energy and Environmental Design.*
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*

**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
Market Access: Copper in Surface Water Regulations

- 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)
Market Access: Copper in Stormwater Regulations

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
Issues Affecting License to Operate
United Nations: GHS

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

Copper Alliance strategy & tactics

**Short-term**
- Become more aware of GHS implementation and existing copper classifications

**Mid-term**
- Correct misclassifications, leveraging existing scientific resources: New Zealand, Korea, Japan

**Long-term**
- Proactively provide information to decision-makers responsible for classification

**Evergreen**
- Maintain Safety Data Sheet (SDS) templates

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**

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

- Proposed to reduce Cu OEL 100X in 2014 = 0.01 mg/m³
- 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 Alliance preparing proactive data submittal to inform decision-making
  - Research underway in EU may support further delay
License to Operate: International Maritime Organization (IMO) Regulations

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 $\rightarrow$ “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.
Other Issues?

**Critical**
- EPA Integrated Risk Information System (IRIS)
- Dodd-Frank
- End of Life Vehicles (ELV)/Restriction of Hazardous Substances (RoHS) regulations

**High**
- Brass scrap stream viability
- Environmental effects of metals mixtures
- Agency for Toxic Substances and Disease Registry (ATSDR) toxicological profile for Cu
- Architectural Cu runoff regulations
- Cooling tower regulations for *Legionella* monitoring

**Moderate**
- Regulatory reform
- Climate change policies
- Green chemistry regulations
- Impacts of Cu on fish olfaction
- Regulations on Cu in brake pads

**Low**
- California Environmental Contaminant Biomonitoring Program
- Environmental effects of metals mixtures
Questions?
Thank you

For more information please contact:

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