HOW SOCIETY BENEFITS FROM MINING AND METALS PRODUCTION

Tony Lea
ICSG Lisbon April 2012
Copper applications

Delivering societal benefit

• Copper

• Copper Alliance programs

Industry investing in local communities

Plans for Copper Foundation
<table>
<thead>
<tr>
<th>COPPER APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Construction</strong></td>
</tr>
<tr>
<td>Plumbing</td>
</tr>
<tr>
<td>Water distribution heating, gas, sprinkler</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Infrastructure</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Utility</td>
</tr>
<tr>
<td>Power transmission and distribution network</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Equipment Manufacture</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial</strong></td>
</tr>
<tr>
<td>Electrical</td>
</tr>
<tr>
<td>Valves, fittings, instruments, and in plant equipment</td>
</tr>
<tr>
<td>Radiators and tubing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Equipment Manufacture cont.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Transp.</strong></td>
</tr>
<tr>
<td>Various railroad, shipping and marine</td>
</tr>
</tbody>
</table>
2010 COPPER USE BY APPLICATION (kt)
DELIVERING SOCIETAL BENEFIT

- COPPER
- COPPER ALLIANCE PROGRAMS
WORLD ELECTRIFICATION
WORLD ELECTRIFICATION

- 1.4 billion people lack electricity access
  - 85% in rural areas of Asia, Africa, Latin America
- Latent 4 million tonne market for copper
  - Average 2.8 kg per capita for electrification
- Current policies and investments inadequate
  - Marginal drop to 1.2 billion people by 2030
  - Room for action by non-state actors
COPPER ALLIANCE PROGRAMS

- Brazil, India, Senegal, Philippines
- Common Features
  - Partnership with major funders
    - World Bank, USAID, power utilities
  - Major leverage
    - Often > 100 times ICA funding
  - Viable, scalable and replicable
THE PARAI SOPOLIS PROJECT
SAO PAULO
ELECTRICITY IN PARAISOPOLOIS

Overloaded transformers
Undersized cabling
Illegal connections
Broken and bypassed meters
No public lighting
Unsafe wiring – fires, electrocutions
Inefficient appliances
PROGRAM PARTNERS

US Agency for International Development (USAID)

International Copper Association (ICA)

AES Eletropaulo (Sao Paulo electric utility)

Wire and Cable, Transformer and other equipment manufacturers

Community-based organizations
PROGRAM ACTIVITY

Community Outreach
Lectures at schools
Energy Efficiency programs
Equipment replacement
Solar Water heating
Rewiring to code or above code

- Safe installations
- Improved energy efficiency

Proper metering
PROGRAM IMPACT

$2 M pilot project
Now a $30M annual investment by AES Eletropaulo

• Improved safety
• Access to quality energy creates enterprises, jobs
• Sense of citizenship

Energy savings up to 50% per household
• From 200-300 kWh/month down to 100-200 kWh/month
COPPER AND CO₂ REDUCTION

10 HP Motor

Motor Efficiency

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>High</th>
<th>Premium</th>
<th>Super Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper use (kg)</td>
<td>4</td>
<td>7</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Efficiency</td>
<td>86%</td>
<td>89.5%</td>
<td>91%</td>
<td>92.9%</td>
</tr>
</tbody>
</table>
Many high profile programs focus on highly visible areas:

- E.g. Compact fluorescent lights

Motor systems use nearly half of all electricity globally

Copper Alliance focuses on industrial motor systems

Widespread Premium Efficiency would result in reduction of:

- 320 billion kilo-watt hours of electricity
- 200 million tons CO$_2$ emissions
### Efficiency Levels

<table>
<thead>
<tr>
<th>Efficiency Levels</th>
<th>Minimum Energy Performance Standards for Industrial Electrical Motors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory</strong></td>
<td><strong>Voluntary</strong></td>
</tr>
<tr>
<td><strong>SUPER PREMIUM</strong></td>
<td><strong>PREMIUM</strong></td>
</tr>
<tr>
<td>IEC class 4</td>
<td>IEC class 3</td>
</tr>
<tr>
<td><strong>HIGH</strong></td>
<td><strong>STANDARD</strong></td>
</tr>
<tr>
<td>IEC class 2</td>
<td>IEC class 1</td>
</tr>
</tbody>
</table>

Advocacy commenced.
COPPER IN AQUACULTURE

No bio-fouling
- Reduced stress, disease and mortality
- No antibiotics and chemical treatments

No need for cleaning
- Increased worker safety
- Reduced cost

No predator penetration or farm fish escape

Net life measured in years
- Copper net is fully recyclable
Antimicrobial Copper touch surfaces in healthcare:

- >99% reduction of harmful bacteria
- 40-70% reduced infection rates
- $10-14 billion cost savings in fight against Hospital Acquired Infections
- Nearly 300 copper alloys registered by U.S. EPA
INDUSTRY INVESTING IN LOCAL COMMUNITIES
THE COPPER FOUNDATION

Subsidiary organization running charitable programs deploying funds received from external donors

Primary focus is access to safe, effective, efficient electrical energy in low income communities

• Urban slums (1 billion)

• Rural villages (1.3 billion people)

All projects are models for replication and scale-up
## POTENTIAL DONORS

<table>
<thead>
<tr>
<th>Potential Donors</th>
<th>Focus</th>
<th>Previous goals/requests ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Works Foundation</td>
<td>Climate change, energy efficiency</td>
<td>4</td>
</tr>
<tr>
<td>Clinton Foundation</td>
<td>Climate change</td>
<td>6</td>
</tr>
<tr>
<td>Ford Foundation</td>
<td>Public health, energy</td>
<td>5</td>
</tr>
<tr>
<td>Packard Foundation</td>
<td>Sustainable energy</td>
<td>1</td>
</tr>
<tr>
<td>Rockefeller Foundation</td>
<td>Sustainable energy, Health &amp; environment</td>
<td>2.5</td>
</tr>
<tr>
<td>Rockefeller Brothers Fund</td>
<td>Climate change</td>
<td>2.5</td>
</tr>
<tr>
<td>Shell Foundation</td>
<td>Sustainable energy</td>
<td>2</td>
</tr>
<tr>
<td>US Dept of State - PEPFAR</td>
<td>Public health, Energy access</td>
<td>6</td>
</tr>
</tbody>
</table>
Thank you

For more information please contact
anthony.lea@copperalliance.org