14th Shanghai Derivatives Market Forum
Non-ferrous Session

Global Market Outlook
Lead & Zinc

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Director of Economics and Environment
International Lead and Zinc Study Group (ILZSG)

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ILZSG Overview

- Intergovernmental organization set up within the UN system
- Significant level of industry representation
- Established by UN in 1959 in New York
- Moved to London in 1977
- From start of 2006 ILZSG, ICSG & INSG co-located in Lisbon, Portugal

www.icsg.org
www.insg.org
ILZSG Membership

- Membership open to any country involved in lead and/or zinc production, usage, or trade.
- 28 members (>85% of global lead/zinc industry):

  Australia  Germany  Morocco  Serbia
  Belgium  India  Namibia  Sweden
  Brazil  Iran  Netherlands  Turkey
  Bulgaria  Ireland  Norway  United States
  China  Italy  Peru  European Community
  Finland  Japan  Poland  Russian Fed.
  France  Korea Rep.  Portugal  Mexico
ILZSG Overview – Work of the Group

- **Promote Market Transparency**
  - Closely monitor production, consumption, prices, stocks, trade flows and market balances
  - Reports and directories

- **Facilitate Co-operation Between Government and Industry**
  - Twice yearly meetings
  - Special conferences/seminars

- **In-depth Research into Issues of Interest/Concern to Members**
  - Environmental legislation
  - Economic developments
Base Metal Price & Consumption

source: WB 2010USDconstant

source: WBMS
World Economic Growth Projection

IMF Projection of GDP Growth

- World average:
  - 2016: 3.1%
  - 2017: 3.4%
  - 2018: 3.6%

- Developed economy:
  - 2016: 1.6%
  - 2017: 1.9%
  - 2018: 2.0%

- Developing economy:
  - 2016: 4.1%
  - 2017: 4.5%
  - 2018: 4.8%
World Economic Growth Projection

Top 10 countries by GDP (Nominal) 2016
Source: IMF (Outlook October 2016)

Top 10 countries by GDP (Nominal) 2020
Source: IMF (Outlook October 2016)

Top 10 countries by GDP (PPP) 2016
Source: IMF (Outlook October 2016)

Top 10 countries by GDP (PPP) 2020
Source: IMF (Outlook October 2016)
World Per Capita Income & Car Consumption Trend

Today consumers use their vehicles for all purposes; in the future, they will choose an optimal mobility solution for each specific purpose.

Today:
One vehicle for every trip purpose

Avg. share of annual driving time

2030:
A solution for each specific purpose

Business
Leisure
Vacation
Shopping

Commuting to work

Commuting to work

Business
Leisure
Vacation
Shopping

www.ilzsg.org

International Lead and Zinc Study Group
### Car Production and L&Z Usage

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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Car output</td>
<td>90,780,583</td>
<td>89,747,430</td>
<td>87,507,027,400</td>
<td>84,141,209</td>
<td>80,092,840</td>
<td>77,629,127</td>
<td>66,482,439</td>
</tr>
<tr>
<td>Lead usage</td>
<td>10,859</td>
<td>10,946</td>
<td>11,149</td>
<td>10,583</td>
<td>10,530</td>
<td>9,876</td>
<td>7,988</td>
</tr>
<tr>
<td>Zinc usage</td>
<td>13,462</td>
<td>13,735</td>
<td>13,160</td>
<td>12,378</td>
<td>12,727</td>
<td>12,610</td>
<td>10,567</td>
</tr>
</tbody>
</table>

- Zinc is still the major coating material for facade and frames.
- Tech Advancement leads to thinner coating consuming less zinc.
- Comparison with 05 Z usage shows a substitution by Aluminium, Carbon Fiber etc.
- Lead usage volume change since 2014 shows an apparent substitution by other batteries.
- E-bike output in 2015 was between 34-36 million.
- E-tricycle output in 2015 was estimated at 12 million.
Europe Lead & Zinc Industry
## Selected Recent Mine Closures

<table>
<thead>
<tr>
<th>Mine</th>
<th>Annual Capacity (000t)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mine</strong></td>
<td><strong>Zn</strong></td>
<td><strong>Pb</strong></td>
</tr>
<tr>
<td>Century, Australia</td>
<td>500</td>
<td>40</td>
</tr>
<tr>
<td>Lisheen, Ireland</td>
<td>175</td>
<td>30</td>
</tr>
<tr>
<td>Wolverine, Canada</td>
<td>53</td>
<td>6</td>
</tr>
<tr>
<td>Paroo Station, Australia</td>
<td>-</td>
<td>85</td>
</tr>
<tr>
<td>Iscaycruz, Peru</td>
<td>170</td>
<td>11</td>
</tr>
<tr>
<td>Black Star, Australia</td>
<td>75</td>
<td>43</td>
</tr>
</tbody>
</table>

Source: New Mines and Smelters 2016/2017 Reports, ILZSG
World Lead Mine Supply Forecast

ILZSG Forecast

• 2017
  - Global  4.3%
  - China   5.1%
  - Ex China 3.6%

Source: ILZSG
World Lead Metal Supply Forecast

ILZSG Forecast

• 2017
  - Global 2.2%
  - China 4.0%
  - Ex China 0.9%

Global Annual Change

Source: ILZSG
World Lead Metal Supply Forecast 2017

- China  +185kt  (4.0%)
- India  +48kt  (9.2%)
- Belgium +13kt  (9.2%)
- United States +13kt  (1.2%)

Source: ILZSG
Port Pirie, Australia

- Redevelopment into flexible metals recovery facility using Ausmelt technology
- Plant capacity remains at 235kt per year
- Benefits include lower operating costs and a reduction in metal and dust emissions

Source: ILZSG
World Lead Metal Demand Forecast

ILZSG Forecast

- **2017**
  - Global: 2.5%
  - China: 4.3%
  - Ex China: 1.1%

Global Annual Change

Source: ILZSG
Demand from E-bike Sector May Have Peaked

E-bike production, China ‘000 units

Source: NBS, CRU, BGRIMM
Lead-Acid Retains Dominant Position in Auto Sector

Light Vehicle Production by Powertrain, World (million units)

Source: ILZSG, LMC Automotive
World Refined Lead Metal Balance

Source: ILZSG

'000 tonnes

www.ilzsg.org
International Lead and Zinc Study Group
World Zinc Mine Supply Forecast

ILZSG Forecast

- **2017**
  - Global: 6.7%
  - China: 4.6%
  - Ex China: 8.1%

Source: ILZSG
Recovery in Indian Zinc Mine Output in 2017

Reduced output due to waste stripping

Source: ILZSG
World Zinc Mine Supply Forecast 2017

- Peru  +113kt  (8.5%)
- Finland  +26kt  (56.5%)
- China  +235kt  (4.6%)
- Australia  +219kt  (25.5%)
- Eritrea  +69kt  (328.5%)

Source: ILZSG
World Zinc Metal Supply Forecast

ILZSG Forecast

- **2017**
  - Global: 2.6%
  - China: 3.6%
  - Ex China: 1.8%

Global Annual Change

Source: ILZSG
World Zinc Metal Supply 2017

- Ongoing Strike at Valleyfield refinery will negatively impact Canadian output
- Floods have damaged water plant at Cajamarquilla in Peru
- Padaeng’s Tak refinery in Thailand to close this year
- Lower output at Korea Zinc’s operations in Republic of Korea
World Zinc Metal Demand Forecast

ILZSG Forecast

- **2017**
  - Global: 2.6%
  - China: 2.3%
  - Ex China: 2.9%

Global Annual Change

Source: ILZSG
Positive Chinese Indicators for Start of 2017

- Property Sales ↑ 15%
- Property Investment ↑ 9.4%
- Air Conditioner output ↑ 16.3%
- Refrigerator output ↑ 18.6%
- Washing Machine output ↑ 4.5%
- Power Consumption ↑ 7.9%
- Automotive sales ↑ 5.1%
- GDP ↑ 6.9%

Source: WoodMackenzie
China Selected Infrastructure Targets for 2017

- New highway 5000km
- Rural road upgrades 200000km
- High quality river channel 500km
- New public mailing centers 20000 units
- New railways 2100km
- Railtrack upgrades 2500km
- Electric railway upgrades 4000km
- New city transits 1581km
- New stations for city transits 826 units
- New airports 10 units
- Airports under construction 34 units

Source: WoodMackenzie
THANK YOU!

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