Pressure building in the tin market?
2016 in review
Recent market trends
The outlook for supply and demand
Summary
Tin price versus other LME metals

LME and Tin price index

Index 2000 = 100

LME base metals price index in 2017
Positive growth in 2016, now slowing
China consumption increasing slowly

- Solder use in minor applications (photovoltaic cell, LED) has increased, offsetting the impacts of miniaturization
- Tin chemical use had a big growth with strong demand in US, South Asia and China
Changes in 2016 tin mine production

-6,000  -4,000  -2,000  0  2,000  4,000

Total World
Myanmar
Africa
Brazil
Other
Australia
Peru
Indonesia
Bolivia
China
Supply increase was wholly from imported concentrate

- China imported around 61,000t tin concentrate and ore in 2016
- Mine production and secondary refined tin in China reduced in 2016
- Refined tin production in China was also impacted by environmental control

Data: ITRI, CRU, CNIA

* Official mine production data has ceased to be published since 2013.
Mine production decreased significantly.
China market balance

China refined tin stock relatively high
China vs rest of world apparent market balance

Refined tin, ‘000 tonnes

Production minus consumption
Recent market trends

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12-month rolling Indonesian refined tin exports

Refined tin, tonnes

Indonesian tin exports strong in Q1 2017 relative to Q1 2016

Data: Indonesian surveyor data (tonnage checked prior to export)
Indonesian export price relationship

![Graph showing the relationship between 2017ICDX trading volume and LME3M Price.

The graph displays the trading volume and price trends for refined tin from January to May, with a peak in January and a drop by February, followed by a recovery in March and April, with a slight decrease before May 18th.

- **2017ICDX trading volume**
  - Jan: 7,000 '000 tonnes
  - Feb: 5,000 '000 tonnes
  - Mar: 6,000 '000 tonnes
  - Apr: 7,000 '000 tonnes
  - Up to May 18th: 4,000 '000 tonnes

- **LME3M Price**
  - Jan: US$19,000/tonne
  - Feb: US$19,400/tonne
  - Mar: US$19,200/tonne
  - Apr: US$19,600/tonne
  - Up to May 18th: US$19,400/tonne
Myanmar Tin Production Areas

Source: ITRI, UNODCCP

Tin mine locations in Myanmar

Source: ITRI, UNODCCP
Processing facility and technology is improving, little ore is exported

Concentrate grades are 20%+

Ore stock in mining sites is decreasing

Local mining is more complicated and difficult, needs more investment

Ore and concentrate production is estimated to decline in 2017

Resource prospect is still unknown
Concentrate and ore from Myanmar are declining
China refined tin imports and exports

* Export tonnage is deduced from other countries' imports; Export data incomplete in recent months

- China cancelled export duty for refined tin from 2017
- Permission for concentrate processing trade is coming

China will become a net exporter again?
SHFE tin trading is more active
Reported refined tin stock

- Consumer
- SHFE
- LME
- Producer*
The outlook for supply and demand

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Technology risks over time

Potential net changes in annual tin consumption by sector, tonnes

- Energy materials
- Tin chemicals
- Tinplate
- Solders

- Short-term (1-5 years)
- Medium-term (6-10 years)
Refined tin use scenarios to 2030

Annual consumption, ’000 tonnes

IU = Intensity of use

(Technological component of changing demand)
Changes in mine production to 2021

Potential changes in tin-in-concentrate production (2016 vs 2021), ‘000 tpy

- Bolivia
- Africa
- Russia
- Brazil
- Other
- Australia
- Peru
- China
- Indonesia
- Myanmar

Project development not a certainty

Existing mines
Projects

-20 -10 0 10 20
### Global supply and demand balances in refined tin

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>World refine tin production</td>
<td>341.9</td>
<td>370.2</td>
<td>335.8</td>
<td>341.4</td>
<td>344.0</td>
</tr>
<tr>
<td>World refine tin consumption</td>
<td>349.0</td>
<td>357.8</td>
<td>345.7</td>
<td>352.7</td>
<td>355.1</td>
</tr>
<tr>
<td><strong>Global market balance</strong></td>
<td><strong>-7.1</strong></td>
<td><strong>12.4</strong></td>
<td><strong>-9.9</strong></td>
<td><strong>-11.3</strong></td>
<td><strong>-11.1</strong></td>
</tr>
<tr>
<td>Reported stocks</td>
<td>34.3</td>
<td>39.1</td>
<td>32.2</td>
<td>28.7</td>
<td>23.0</td>
</tr>
<tr>
<td>World stock ratio</td>
<td>5.1</td>
<td>5.7</td>
<td>4.8</td>
<td>4.2</td>
<td>3.4</td>
</tr>
<tr>
<td>Base price (US $/t)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LME cash price - annual average</td>
<td>22,304</td>
<td>21,893</td>
<td>16,076</td>
<td>17,752</td>
<td>-</td>
</tr>
</tbody>
</table>

Data: ITRI, CRU

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**Supply deficit maintained**
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An imminent price explosion?

Pressure building in the tin market:
- Sustained global supply deficit
- Visible stocks near historic lows
- Underlying decline in mine supply – rising costs – few alternative sources

But potential ‘pressure relief’:
- Macro-risks to tin demand
- Price responsive Indonesian tin output
- Hard-to-predict Myanmar output
- Chinese exports?
2017 Asia Tin Week

12-15, September, 2017
Kunming, China

Expected 300+ delegates
Half overseas delegates and half Chinese delegates

Highlights:

• CEO discussion

• Main tin production country reports - China, Indonesia, South America

• Application & technology outlook: Solder, Tin chemical, Advanced smelting technology

• YTC smelter visit
Thank You

We believe that global co-operation on markets, technology, sustainability and regulatory issues is the most cost effective route to achieve long-term success for the industry. If we work together effectively then the outlook for tin is very positive.

Global co-operation for long-term success