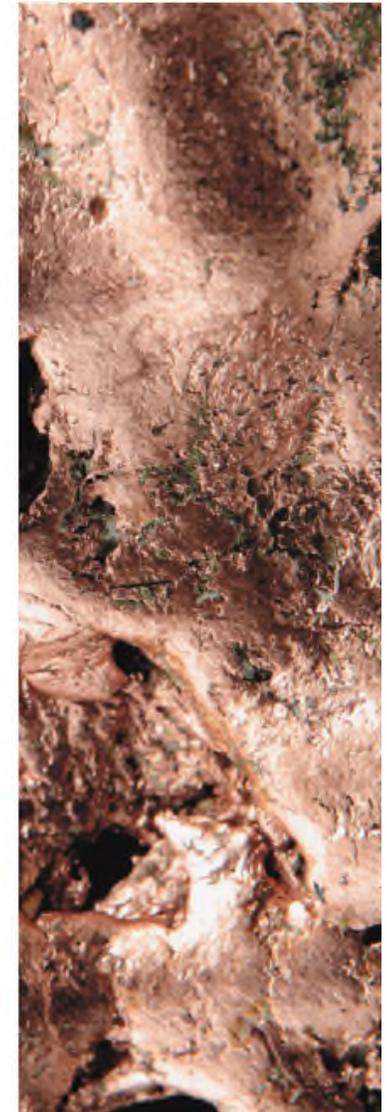


**Revolutionising the  
recovery of the  
technology metals of the  
future**



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Revolutionising the recovery of the technology metals of the future



## Highlights

Continued interest  
from mining  
companies in  
leaching  
technologies

Continued success  
in registration of  
patents

Company well  
financed and  
reviewing  
complementary  
opportunities in the  
mining sector

# Introduction

Revolutionising the recovery of the technology metals of the future

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- AIM traded mining and mineral processing technology company.
- Strong technical management with financial markets' expertise and experience.
- Business objective is to become a successful company in the mining sector focused on the mining and processing of the technology metals of the future.
- Achieved by the commercialisation of proprietary mineral processing technologies and potential strategic partnerships in producing mines and through equity positions in advanced projects.
- Our core asset is our intellectual property.

<b>Shares issued:</b>	1,488,730,149
<b>Management, directors', consultant options</b> @ 4.92p @ 0.22p	12,900,000 43,300,000
<b>Recent market capitalisation:</b>	£1.8m
<b>AIM code:</b>	AXM
<b>Finances</b>	Placing for £750,000 gross in Feb. 2017

## Highlights

### Revolutionising the recovery of the technology metals of the future

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#### Metaleach™

MetaLeach® is our wholly owned subsidiary and will revolutionise the extraction processes for many base metals deposits by reducing costs, enhancing operating margins and increasing production.

#### Ammleach.

Our core technology has major economic, technical and environmental benefits. Unlike some new technologies, it requires no special purpose built equipment. The proprietary ammonia process selectively extracts base metals from ores under ambient temperature and pressure conditions.

#### Hyperleach™

A proprietary process which utilises chlorine based chemistry for the extraction of metals, especially copper, zinc, nickel, cobalt, molybdenum and rhenium from sulphide ore deposits and concentrates.

- Licence agreement with Accudo Metals in Australia – commits to DFS on copper project
- Continuing confidence in technology prospects and registration of patents
- Lithium recovery R&D initiative – expanded scope
- Company well financed and reviewing complementary opportunities in the Mining Sector

## Background

### Mining industry & technology

Our world is ever more dependent upon metals and minerals, but especially.....

#### **The *High Technology Metals of the Future*, ie:**

- **Aluminum** – aerospace, transportation, construction, packaging
- **Copper** – construction, transport, infrastructure, equipment
- Speciality metals use in batteries for electric vehicles and energy storage:

**Cobalt** – ~ 50% of world's resources and supply from DRC

**Lithium** – lithium ion batteries

Overarching this is that the best method, in our opinion, for extracting these metals where ores are amenable is .....

**Hydrometallurgy** - an efficient and environmentally friendly leaching technology



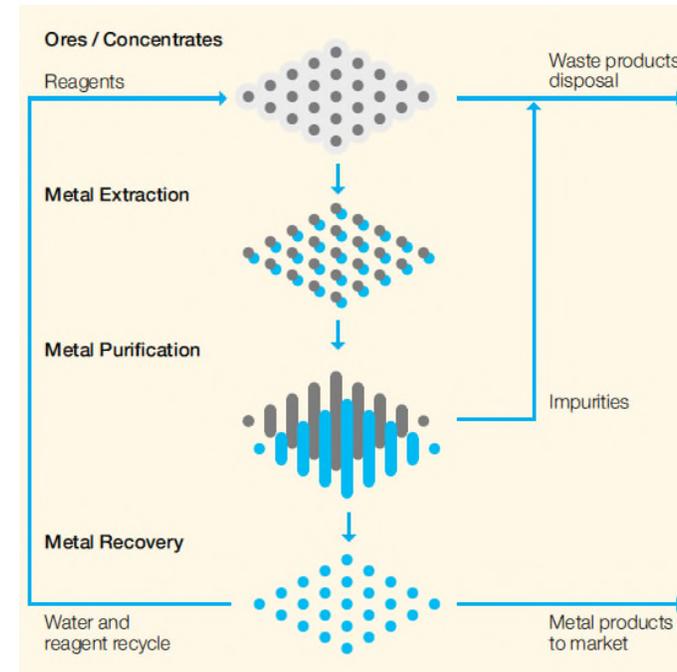
Source: Rio Tinto



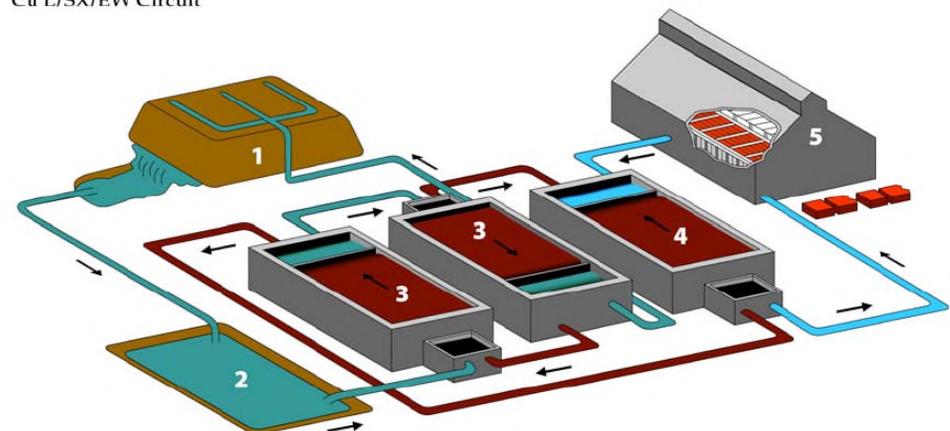
# The background

## Hydrometallurgy process has major benefits

- Higher returns by increasing mine-site metal product value.
- Can makes uneconomic ore bodies economic.
- No associated concentrate costs, ie: transport, smelter & refinery charges (which can be > 40% of contained metal value).
- Valuable metal by products can be credits, unlike concentrate producers.
- **Environmental benefits significant**



Cu L/SX/EW Circuit



## Major operational and economic advantages

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- Alkaline/ammonia leach process at **ambient pressure and temperature**
- **Proprietary two stage leaching process**
  - Ore specific pre-treatment stage
  - Heap or tank leaching
- **Proprietary solvent extraction step to avoid ammonia carry-over into electrolyte**
- **Greatly reduced AmmLeach® reagent consumption** of high-acid-consuming ores means significant capex and opex savings
- **Clean target metals PLS**, unlike acid leach
- **Uses conventional equipment**
  - Electro-winning is identical to conventional acid circuits
  - Direct replacement for acid leaching in current operations
  - Minimal changes to plant; higher organic transfer efficiencies requires smaller plant
- **Environmental benefits**
  - Reduced transport/shipping impact and costs
  - Minimal likelihood of Acid Mine Drainage (AMD)

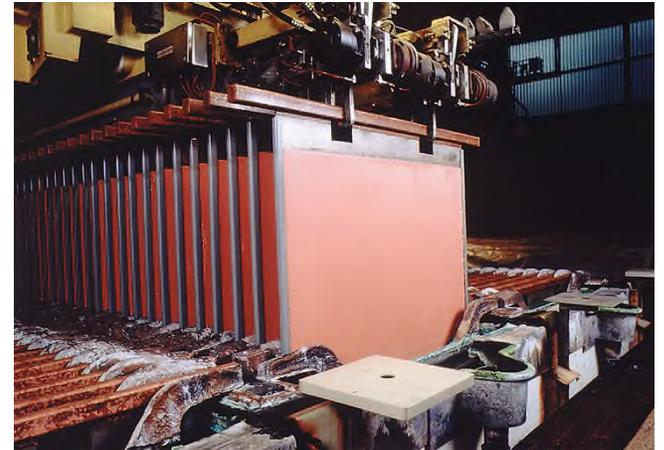
## Major economic and environmental benefits

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- Major capital and operating cost savings (typically 30-40%) possible due to magnitude of reagent (ammonia cf acid) consumption differential.
- Aside from the very substantial capital and cost savings, AmmLeach<sup>®</sup> has several major operational and environmental advantages over conventional acid leaching.
- Much simpler process circuits because of the low level of impurities in the leach solutions, and hence lower capital to clean up.
- Significantly lower decommissioning/closure costs – no acid mine drainage liability.

The main targets for the AmmLeach<sup>®</sup> process are:

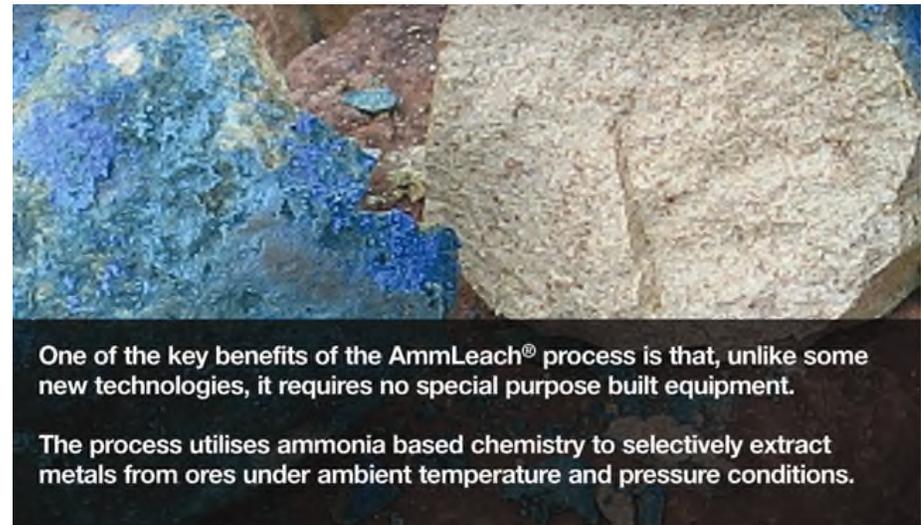
- Copper
- Cobalt oxide deposits
- Zinc oxide (non-sulphide) deposits



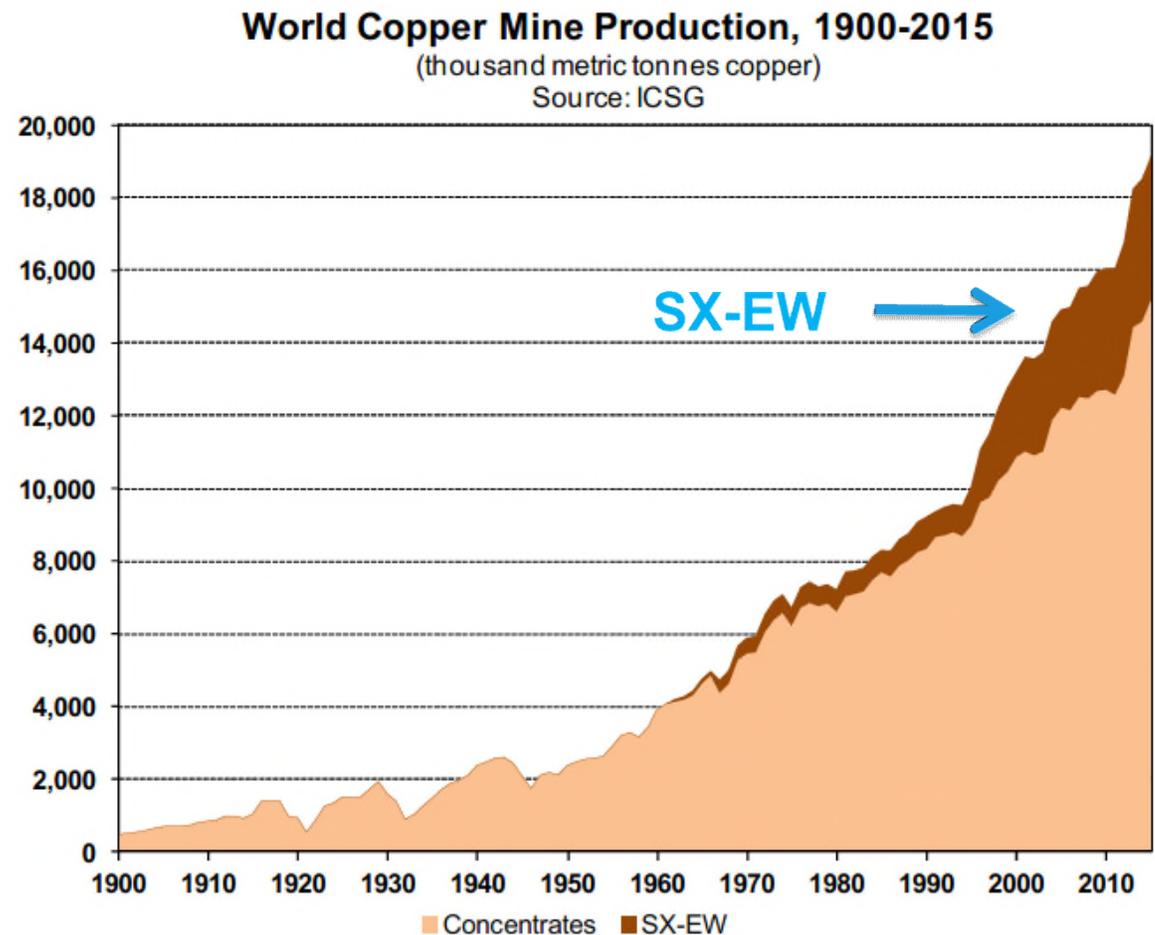
Geographic diversification is offered as the countries with the most prospective geology for hosting high acid consuming copper (Cu), cobalt (Co) and zinc (Zn) oxides are:

- Australia (Cu & Co)
- Turkey (Zn, Cu)
- DRC (Cu, Cu/Co)
- Zambia (Cu & Co)
- Peru (Cu & Zn)
- Chile (Cu)
- Mexico (Cu & Zn)
- Central America (Zn)
- USA (Cu & Zn)

Testwork done on many different opportunities worldwide



- Sulphides ~80% of world primary copper production
- Conventional treatment is to produce concentrate and ship to smelter
- Copper production from SXEW is growing, >20%
- Licence agreement with Accudo Metals in Australia



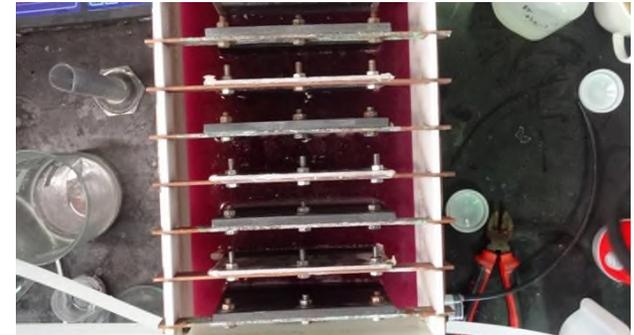
- Sulphides >95% of world primary zinc production but average head grade < 7% zinc
- Conventional treatment is to produce concentrate and ship to smelter - Roast – Leach - Electrowin process

Oxides considered commercially untreatable. However, in general, zinc oxides represent the highest grade undeveloped near surface base metal deposits



- Economics dictate direct shipping oxide ores limited to grades >20-25% zinc
- Large tonnages of <20% ore exist, especially in Turkey with world class resources
- Significantly lower cash operating costs, in lowest quartile (<US\$0.40/lb), forecast
- Increase reserves and mine life by processing substantial 'low' grade ore (<20%)

- Production of high purity LME grade zinc
- Successful batch test 2014 in Perth, using conventional equipment, at ambient temperature & pressure to produce zinc cathode.
- First successful test of AmmLeach<sup>®</sup> technology for zinc and the first solvent extraction of zinc from primary oxide ores using ammoniacal leaching.
- Recycles reagents



## Lithium recovery

### New R&D initiative



According to Morgan Stanley:  
global electric vehicle fleet  
forecast to reach one billion by  
2050, more than internal  
combustion engines

Courtesy of Tesla Motors, which became bigger than General Motors and Ford in April 2017

- New lithium processing technology R&D project with Dr N. Welham
- Investigating a promising route to the direct dissolution of lithium from lithium bearing minerals under ambient temperature and pressure conditions.
- Opportunity to earn up to 80% licence rights in any intellectual property created
- Hard rock resources more viable proposition than conventional brine sources for rapid development as time from commissioning to first concentrate can be a matter of a few weeks.
- Complements existing AmmLeach<sup>®</sup> potential for cobalt production for use in lithium batteries

## Summary

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- Hydrometallurgical extraction of base metals at the mine is ultimate production route
- AmmLeach<sup>®</sup> opportunity for copper project in Australia with Accudo now at DFS
- Focused on royalty and/or licence fee structure, or minority project interests
- New lithium R&D initiative gives exposure to three essential high technology metals – Cu, Co & Li
- Company well financed and reviewing complementary opportunities in the Mining Sector



# Enquiries

## Contact Details

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### Alexander Mining plc

Martin Rosser, CEO

2nd Floor

85-87 Borough High Street

London, SE1 1NH, UK

Tel: +44 (0) 20 7078 9564

Email: [mail@alexandermining.com](mailto:mail@alexandermining.com)

Web: [alexandermining.com](http://alexandermining.com)