



# 2017 TZMI Conference

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# ILUKA



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## **Non-IFRS Financial Information**

This document contains non-IFRS financial measures including cash production costs, non production costs, Mineral Sands EBITDA, Group EBITDA, EBIT, free cash flow, and net debt amongst others. Iluka management considers these to be key financial performance indicators of the business and they are defined and/or reconciled in Iluka's annual results materials and/or Annual report. Non-IFRS measures have not been subject to audit or review.

All figures are expressed in Australian dollars unless stated otherwise.

# Compliance Statement



## **Mineral Resources and Ore Reserves Estimates**

As an Australian company with securities listed on the Australian Securities Exchange (ASX), Iluka is subject to Australian disclosure requirements and standards, including the requirements of the Corporations Act and the ASX. Investors should note that it is a requirement of the ASX listing rules that the reporting of ore reserves and mineral resources in Australia comply with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the "JORC Code") and that the Ore Reserve and Mineral Resource estimates underpinning the production targets in this presentation have been prepared by a Competent Person in accordance with the JORC Code 2012.

Information that relates to Mineral Resources estimates has been previously announced to ASX on 21 February 2017 in a release titled "Updated Mineral Resource and Ore Reserve Statement" and is available at [www.iluka.com/investors-media/asx-disclosures](http://www.iluka.com/investors-media/asx-disclosures). Iluka confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed. Iluka confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.

## **Production targets**

Production targets and the basis thereof are noted within the relevant disclosure.

The outlook included in this presentation is indicative only and should not be construed as guidance. The information is subject to further study, investment approval from the Board and is subject to changes in market and operating conditions; political risk; and any significant unplanned operational issues.

## Revenue Factors

Commodity price assumptions are established internally based on monitoring supply and demand on an ongoing basis. Price assumptions are benchmarked against commercially available price forecasts by industry observers. Revenue factors are used to establish mine sensitivities and to test for robustness of the Ore Reserve. Detailed price assumptions are deemed to be commercially sensitive and are not disclosed.

## Costs

### *Cataby*

Capital assumptions are based on budget pricing for the majority of the work packages, other than site buildings and camp construction and demolition for which a design and construct tender was received. Pricing for the contractors direct and indirect works has been derived from a combination of the following sources: tendered quotations procured from suppliers and contractors; purchase quotation from suppliers and contractors; budget quotations procured from suppliers and contractors; historical data sourced from previously tendered or estimated projects of a similar nature and location. Where necessary items have been factored to allow for different size/capacity, etc; estimated, factored or built-up rates; and provisional or lump sum allowances where the use of the aforementioned methods are not possible.

Pricing for the operating cost estimate has been derived from a combination of the following sources: budget quotations procured from suppliers and contractors; estimated, factored or built-up rates; historical data sourced from other Iluka mine sites; and provisional or lump sum allowances where the use of the aforementioned methods are not possible. Cost and recovery penalties have been applied to deleterious elements.

Transportation charges have been procured from contractors. Processing costs are based on actual Iluka operational costs, including overheads. Actual operating costs are used to benchmark the operating cost estimates.

Allowances have been made for royalties payable to Government and private stakeholders.

### *Sierra Rutile*

Capital assumptions for the Sembahun development were determined during the PFS, which is yet to be completed. Existing infrastructure will be utilised for mineral separation. Other costs were based on previous recent experience of SRL mine developments and industry estimates. Operating costs are based on historical performance and updated for current economic conditions. Cost and recovery penalties have been applied to deleterious elements in the optimisation and subsequent cost estimate.

All costs are calculated in \$US.

Transportation charges are based on recent rates procured from SRL. Treatment costs are based on actual operational costs including deleterious elements. Actual operating costs are used to benchmark the operating cost estimates. Appropriate allowance has been made for Sierra Leone Government and other private stakeholder royalties.

## Environment

Studies and approvals for the Sembahun project are currently in progress and there is a reasonable expectation that these will be in place before the project is executed.

## Introduction



- Portfolio
- Approach

## Operations and Projects



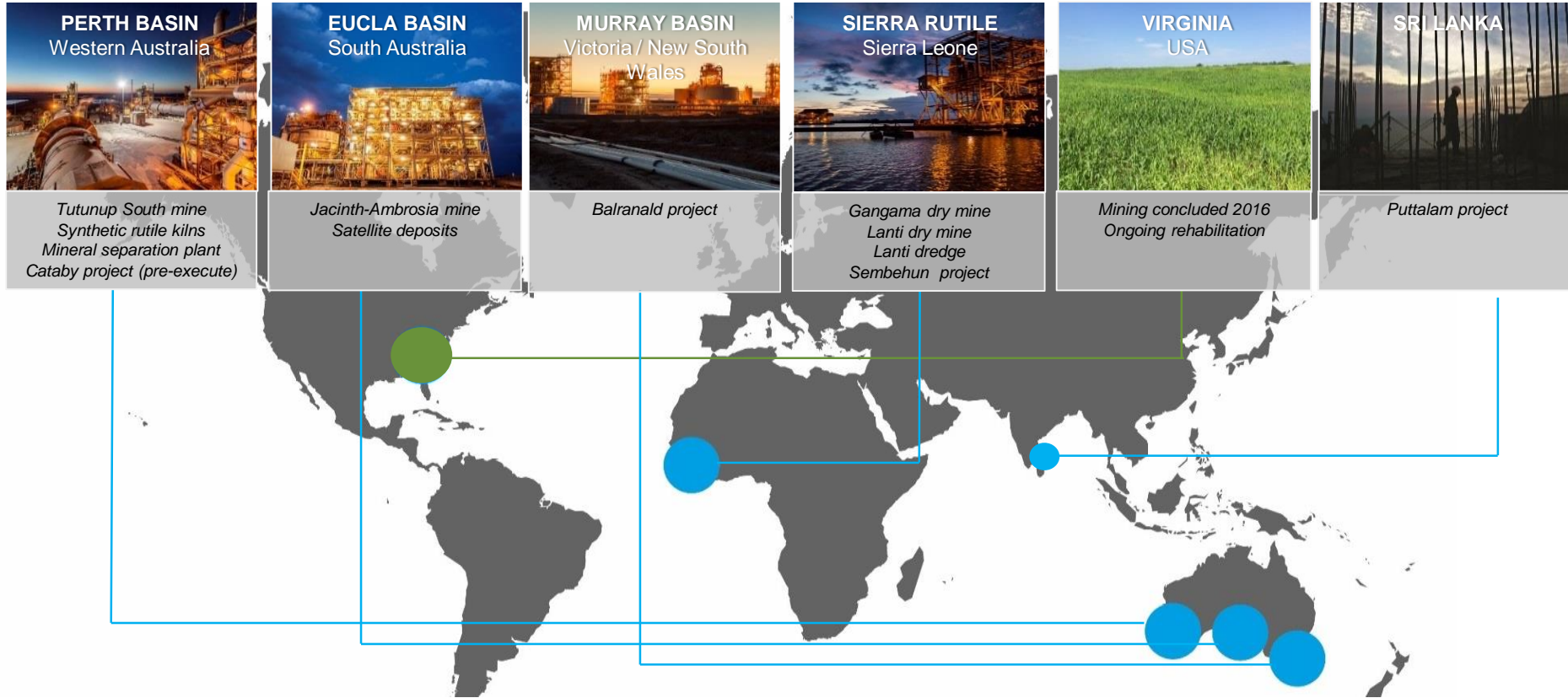
- Sustainability Improvements
- Jacinth-Ambrosia restart and expansion
- Sierra Rutile improvements and expansions
- Major projects update

## Markets Outlook



- Zircon market
- Titanium market

# Iluka's Mineral Sands Portfolio



## Iluka's Product Suite

### Zircon

Used in ceramics, refractories and other specialty applications.

Opaque, hard wearing, heat resistant



### Titanium Dioxide (TiO<sub>2</sub>) Feedstock

TiO<sub>2</sub> pigment used in paints, plastics, paper

Opaque, UV resistant,

Strong and light metal, corrosion resistant



## Create and deliver value for shareholders

### Flex assets in line with market conditions

Jacinth-Ambrosia restart and expansion



### Preserve and advance growth opportunities

Cataby project

Sierra Rutile expansion projects

Balranald staged development approach

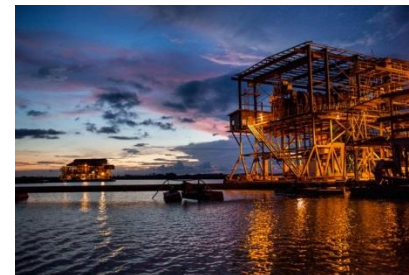
Fine minerals project

Puttalam project



### Act counter cyclically where appropriate

Sierra Rutile acquisition completed December 2016



### Disciplined capital allocation

Strict financial criteria applied and strategic rationale must be met

Focused on shareholder returns through the cycle





# Iluka's Operations and Projects



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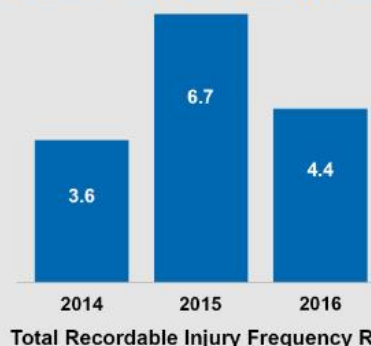


Ongoing integration of Iluka's **safety and risk mitigation framework** to strengthen Sierra Rutile's sustainability performance



Sierra Rutile Limited

Continued focus on **preventing injuries** and remaining **fatality-free**



Awarded the South Australian **Premier's Community Excellence Award** for Social Inclusion



Senior female representation

**33%**

Executive management

**33%**

Board

MEMBER OF

**Dow Jones Sustainability Indices**

In Collaboration with RobecoSAM


Incorporated into 2017 **DJSI Australia index** for leading sustainability performance



**Public sustainability targets** set and communicated to track and improve performance across material issues



# Jacinth-Ambrosia Restart

- 
- J-A restart decision reflects:
    - continued tightening zircon market
    - substantial drawdown of heavy mineral concentrate (HMC) inventory
  - Rapid return to full production
  - 40 employees and 60 contractors recruited for restart
  - Restart expected to be complete in mid-December

# Jacinth-Ambrosia Upgrade

## Project Objectives

- Increase J-A plant throughput by ~30% to offset declining ore grades

## Project Scope

- Wet concentrator plant expansion
- 2<sup>nd</sup> mining unit to handle additional ore
- Accommodation camp capacity increase
- Project cost ~\$40 million
- Project completion Q2 2019

## Recent Progress

- DFS expected to be completed mid 2018
- Execute expected to commence H2 2018, subject to Board approval and market conditions



# Sierra Rutile Improvements Achieved

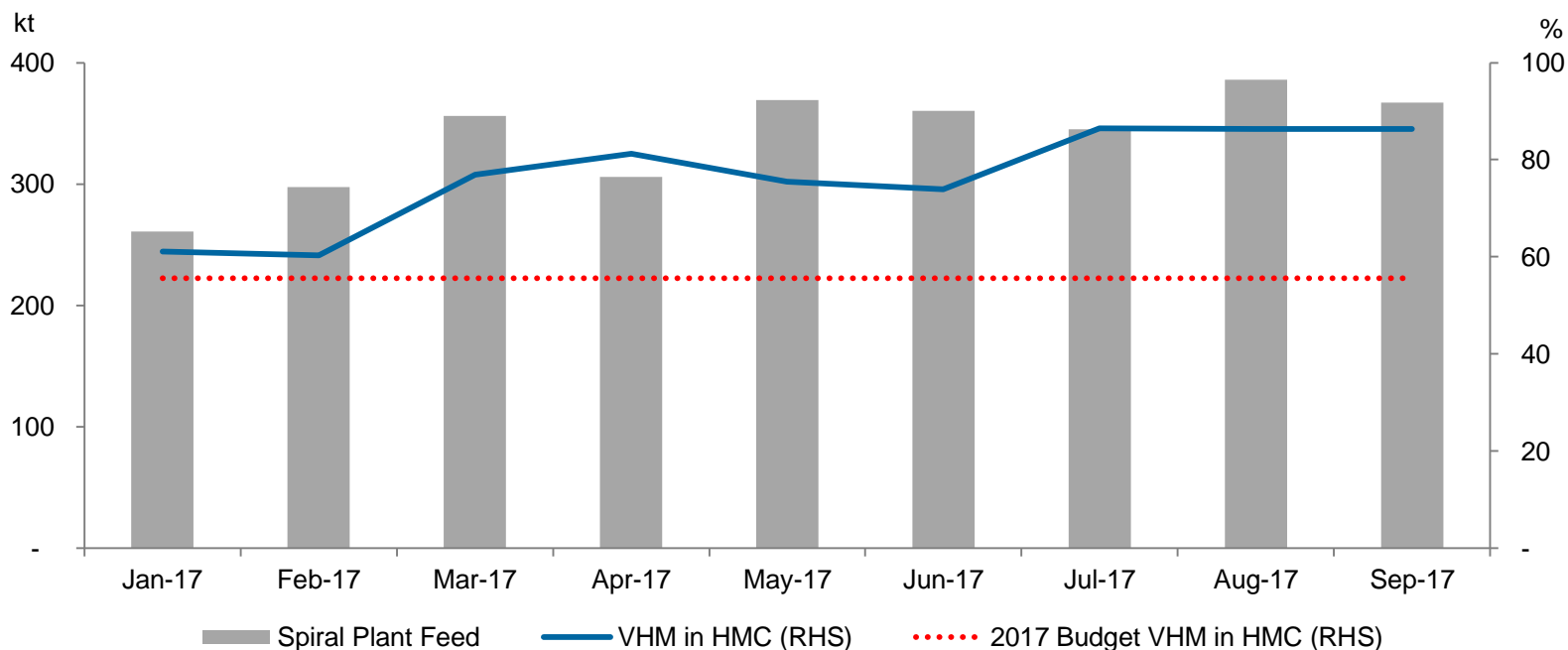
- Align safety practice with international standards
- General improvement in operating practices
- Implementation of Iluka mine planning approach
- Improved standard of tailings dam construction and management
- Investment in maintenance, increasing life of assets
  - supported prolonging dredge life by 6-12 months
- Processing of remnant stockpiles
  - ~4.5kt additional rutile recovered (FY 2017)
- Exploration focused on integrating best practice
  - 3D geomorphological study and geological characterisation of deposits



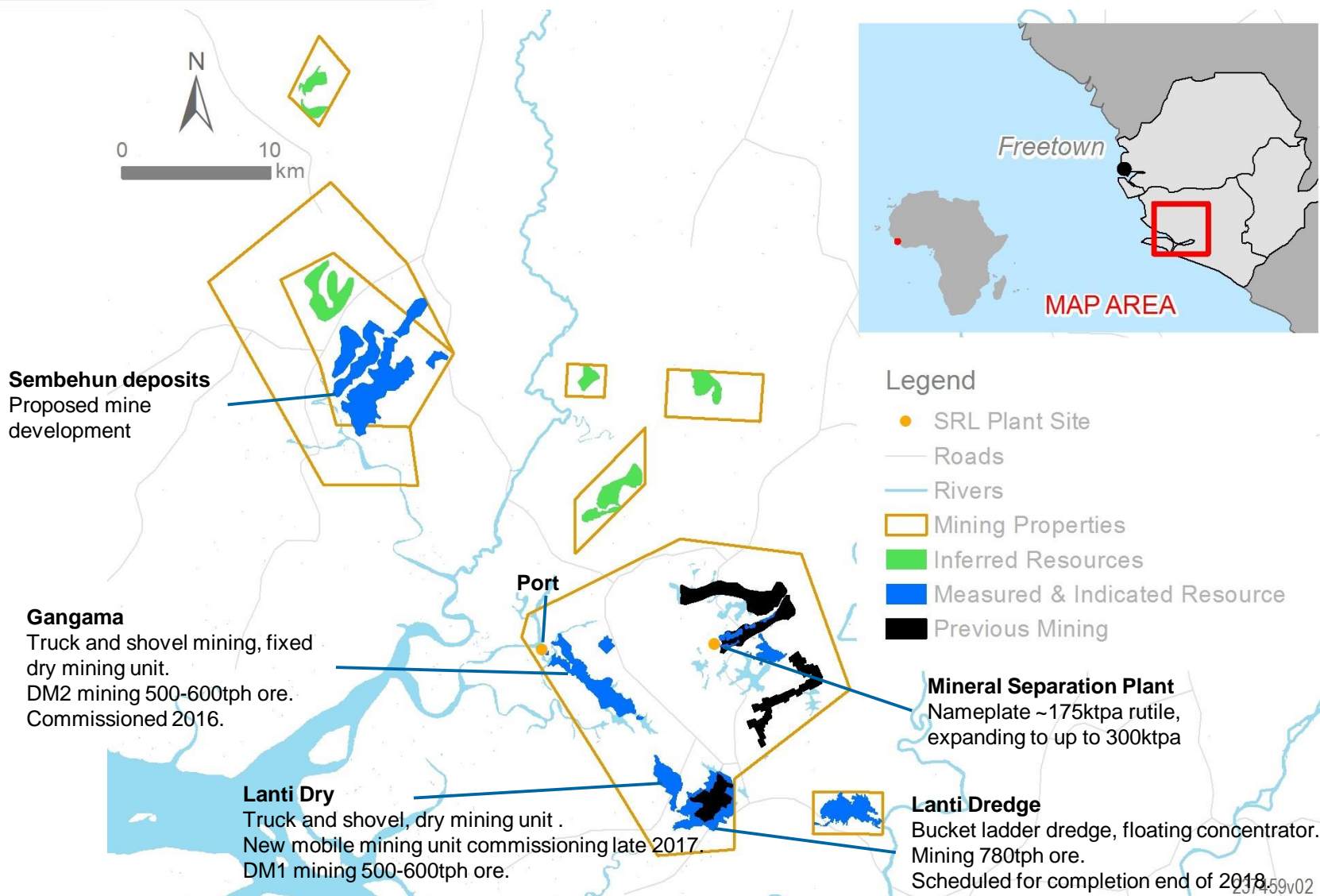
# Sierra Rutile Improvements Achieved

- Adjustments to plant settings at dry mines and establishment of standard operating practice has:
  - debottlenecked concentrator throughput and increased runtimes; and
  - improved rutile recovery and increased heavy mineral concentrate grades.
- These adjustments have also enabled debottlenecking of mineral separation plant

## 2017 Lanti Dry & Gangama Spiral Plant Feed and Valuable Heavy Mineral (VHM) in Heavy Mineral Concentrate (HMC)

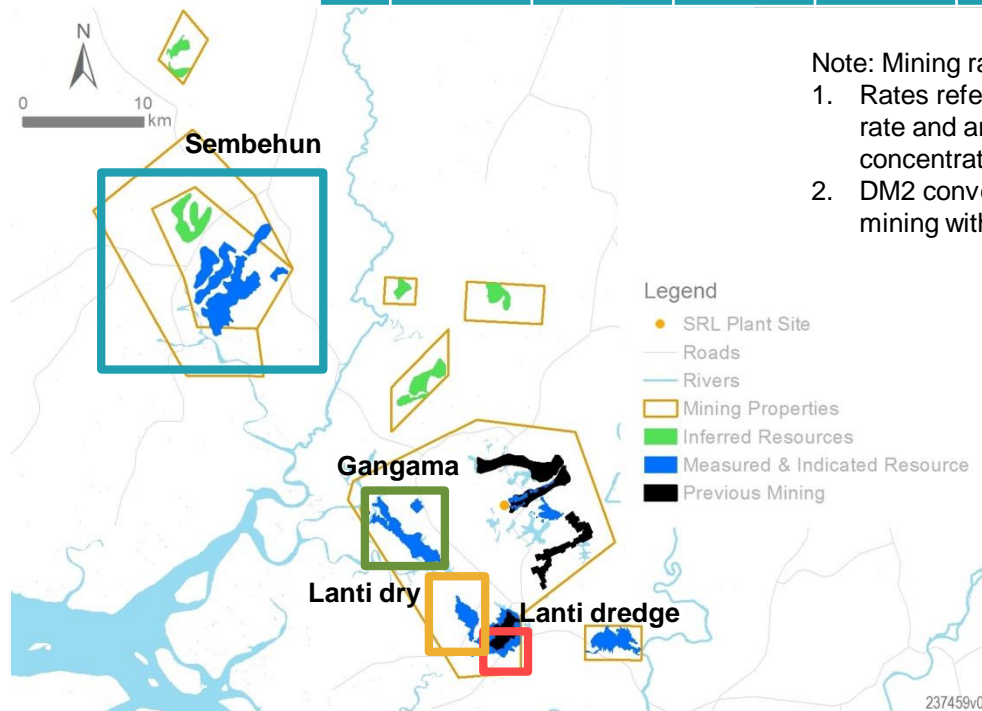


# Sierra Rutile Deposit Locations



# Sierra Rutile Mine Schedule

| Plant Unit <sup>1</sup> | 2017                 | 2018 | 2019                   | 2020                     | 2021 | 2022                    | 2023                    | 2024                    | 2025 | 2026 | 2027 |
|-------------------------|----------------------|------|------------------------|--------------------------|------|-------------------------|-------------------------|-------------------------|------|------|------|
| <b>D1</b>               | Lanti dredge 780tph  |      |                        |                          |      |                         |                         |                         |      |      |      |
| <b>DM1</b>              | Lanti dry 500-600tph |      |                        | Lanti dry 1,000-1,200tph |      |                         |                         | Sembehun 1,000-1,200tph |      |      |      |
| <b>DM2<sup>2</sup></b>  | Gangama 500-600tph   |      | Gangama 1,000-1,200tph |                          |      |                         | Sembehun 1,000-1,200tph |                         |      |      |      |
| <b>DM3</b>              |                      |      |                        |                          |      | Sembehun 1,000-1,200tph |                         |                         |      |      |      |



Note: Mining rates dependent on spiral plant feed

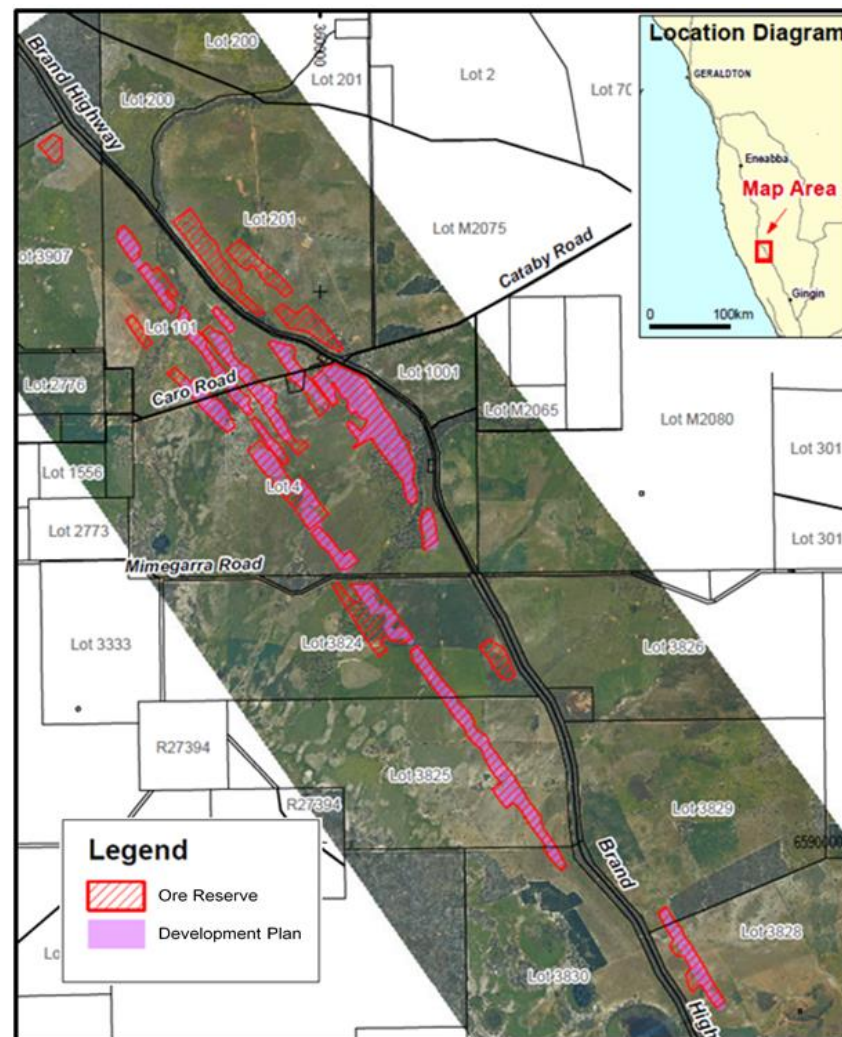
1. Rates refer to tonnes per hour (tph) ore feed rate and are an indicator of capacity of each concentrator and not expected production
2. DM2 converted from truck and shovel to in-pit mining with move to Sembehun

# Cataby Development Plan and Ore Reserve

## Deposit

- 8.5 year mine life based on development plan which is underpinned by 86% Proved Ore Reserve and 14% Probable Ore Reserve.
- Two in-pit mobile mining units
- 1,100 tph feed rate to wet concentrator plant
- Mine life could increase beyond 8.5 years
  - by accessing additional 40 mt in the ore reserve
  - dependent upon land access and approvals

| Cataby Ore Reserves        | Ore Mt     | HM %       | Ilmenite %  | Zircon %   | Rutile %   |
|----------------------------|------------|------------|-------------|------------|------------|
| Development Plan           | 80         | 6.6        | 60.0        | 9.6        | 4.1        |
| Ore Reserve - Proved       | 88         | 6.3        | 59.7        | 9.3        | 4.1        |
| Ore Reserve – Probable     | 33         | 4.1        | 62.3        | 9.4        | 4.3        |
| <b>Ore Reserve - Total</b> | <b>120</b> | <b>5.7</b> | <b>60.2</b> | <b>9.3</b> | <b>4.1</b> |



# Cataby Project Update

| Schedule        | 2017 |    |    | 2018 |    |    |    | 2019 |    |
|-----------------|------|----|----|------|----|----|----|------|----|
|                 | Q2   | Q3 | Q4 | Q1   | Q2 | Q3 | Q4 | Q1   | Q2 |
| Engineering     |      |    |    |      |    |    |    |      |    |
| Award contracts |      |    |    |      |    |    |    |      |    |
| Construction    |      |    |    |      |    |    |    |      |    |
| Pre-strip       |      |    |    |      |    |    |    |      |    |
| Commissioning   |      |    |    |      |    |    |    |      |    |
| SR Production   |      |    |    |      |    |    |    |      |    |

Newman Wet Concentrator Plant (Eneabba)



Note – Timing assumes Q4 2017 Board approval

| Capital Cost                         | \$ million     |
|--------------------------------------|----------------|
| Land, EPCM & Owners Costs            | 65-70          |
| Camps & Site Buildings               | 30-35          |
| Power Supply                         | 10-15          |
| Equipment supply & site construction | 145-155        |
| <b>Total*</b>                        | <b>250-275</b> |

- Major environmental approvals obtained
- Integrated project team
- Engineering substantially complete
- Long lead power supply equipment procured
- Camps contracts awarded
- Existing plant to be relocated:
  - Primary concentrator & pumps from Eneabba
  - Thickeners & pumps from Murray Basin
  - Secondary concentrator from Murray Basin

\* Given recent cost escalation in Western Australia, capital likely to be at top end of estimate range

This slide should be read in conjunction with the disclaimer on forward looking statements on slide 2 and compliance statement on slide 3.



# Balranald Project

## Project Overview

- Large, deep, high grade rutile-rich deposit near Balranald, New South Wales
- Industry significant source of rutile, ilmenite and zircon
- Definitive feasibility study based on conventional mining method completed
- Progressing separate technology study using underground mining method



## Balranald Project Mineral Resources, as at 31 December 2016

|                        | Material<br>mt | HM Grade<br>% | Ilmenite<br>% | Zircon<br>% | Rutile<br>% |
|------------------------|----------------|---------------|---------------|-------------|-------------|
| <b>Nepean</b>          |                |               |               |             |             |
| Indicated              | 8.4            | 27.5          | 59.8          | 14.4        | 14.5        |
| Inferred               | 0.8            | 11.2          | 57.3          | 14.6        | 14          |
| <b>West Balranald</b>  |                |               |               |             |             |
| Measured               | 11.9           | 31.9          | 64.1          | 10.8        | 12.2        |
| Indicated              | 19.9           | 35.1          | 64.3          | 11.3        | 12.2        |
| Inferred               | 4.5            | 26.5          | 62.4          | 8.3         | 9.4         |
| <b>Total Balranald</b> | <b>45.5</b>    | <b>31.6</b>   | <b>63.1</b>   | <b>11.5</b> | <b>12.4</b> |

## Underground Mineral Sands Mining

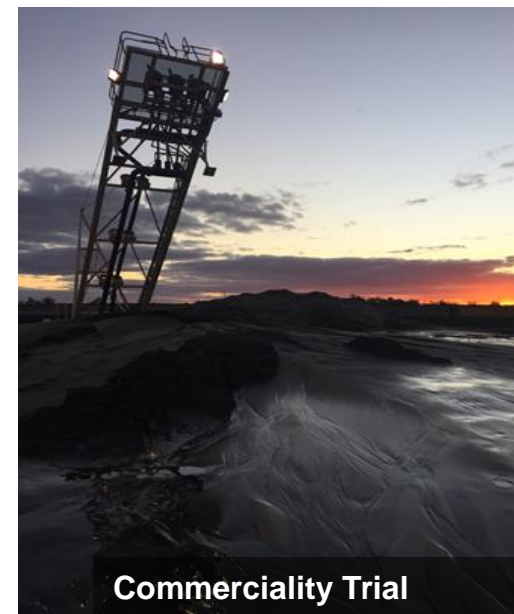
Use of directional drilling technology and internal expertise

Significant advantages to approach

- access to deep deposits (Balranald ~60m underground)
- minimal environmental footprint versus conventional mining
- potentially less capital intensive
- scalable operations
- portfolio flexibility

# Balranald Way Forward

- Continue staged de-risking in 2018 with third production trial
  - current estimate ~\$25 million
- Staged approach to production start up in 2021
  - requires approvals (modification of consent)
  - new mining equipment and plant modifications



| Activity                   | Status   | Comment  |
|----------------------------|----------|--|
| Third production trial     | Planning | Return to current site for mining and backfilling 3 consecutive stopes at operational rates, recoveries and utilisation. |
| Staged production start up | Pending  | Additional fixed processing plant to make a product.<br>Extend mining north and south. Minimal infrastructure assumed.   |
| Optimise production        | Pending  | Introduce additional mining systems  |

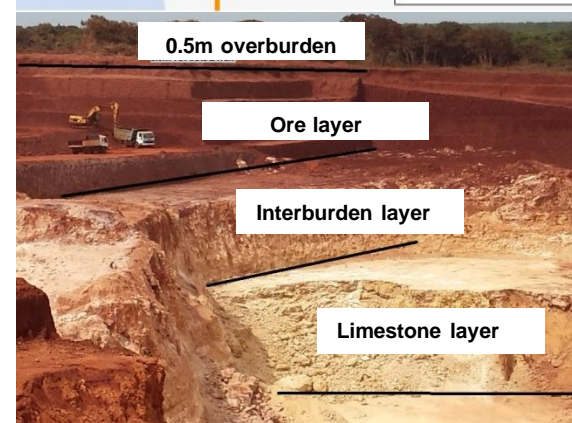
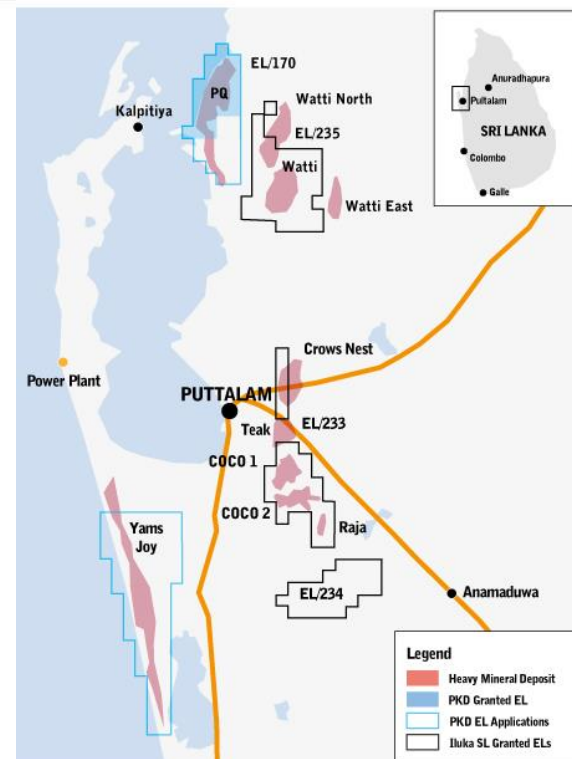
# Sri Lanka PQ Deposit

## Location and History

- Located ~130km north of Colombo
- 1990's – PQ deposit explored – ceased work due to civil conflict
- 2012 – Iluka returned to Sri Lanka
- 2015 – Scoping study conducted
- 2017 – Pre-feasibility phase progressed

## Deposit

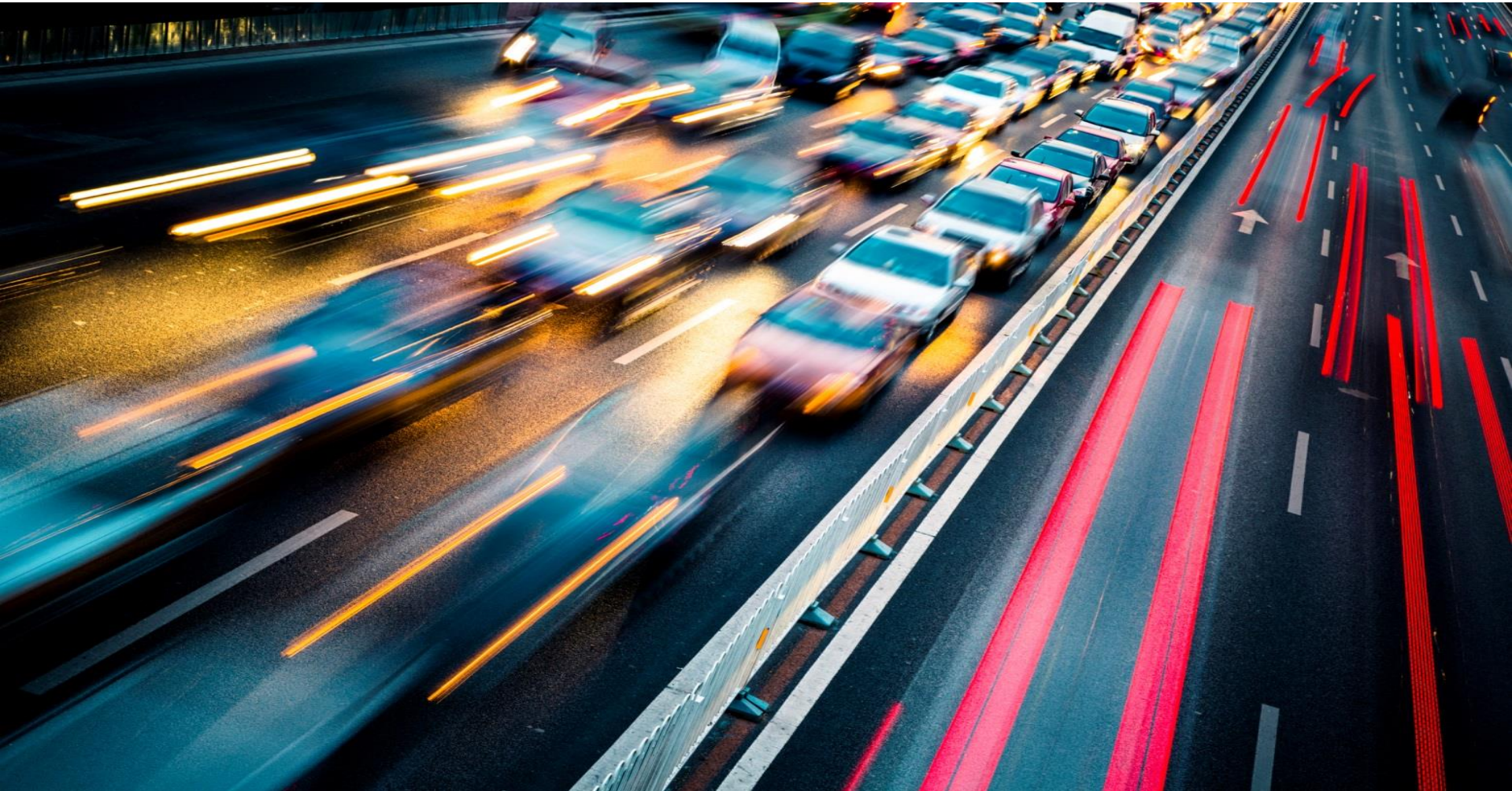
- Homogeneous deposit with ore up to 60m thick
- Limestone layer currently mined by Siam City Cement
- Ilmenite ~50%  $TiO_2$ 
  - suitable for sulfate pigment, sulfate or chloride slag markets
- HM grade from 5%-15% (avg ~9%), clay content ~20 %
- Minimal waste – mineralisation to surface



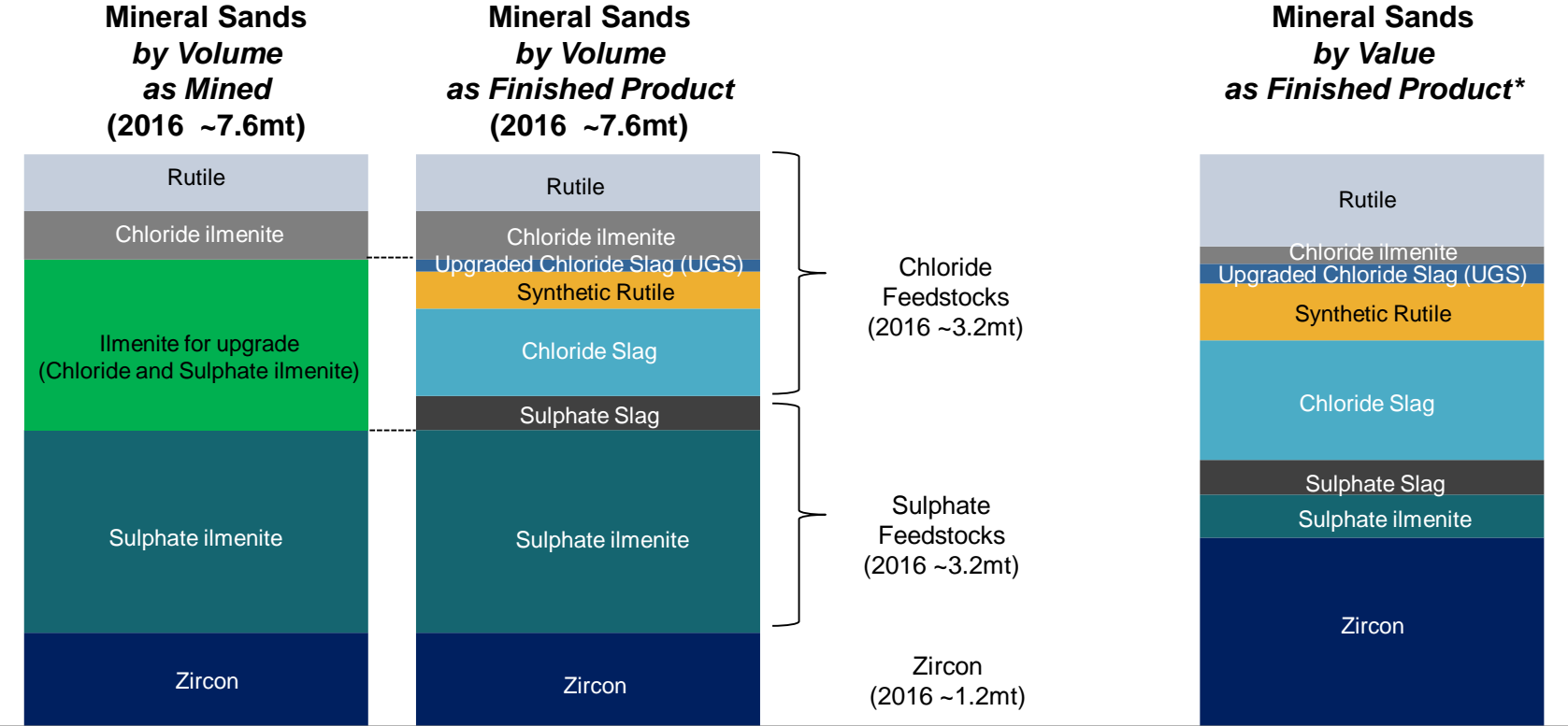


# Industry Dynamics

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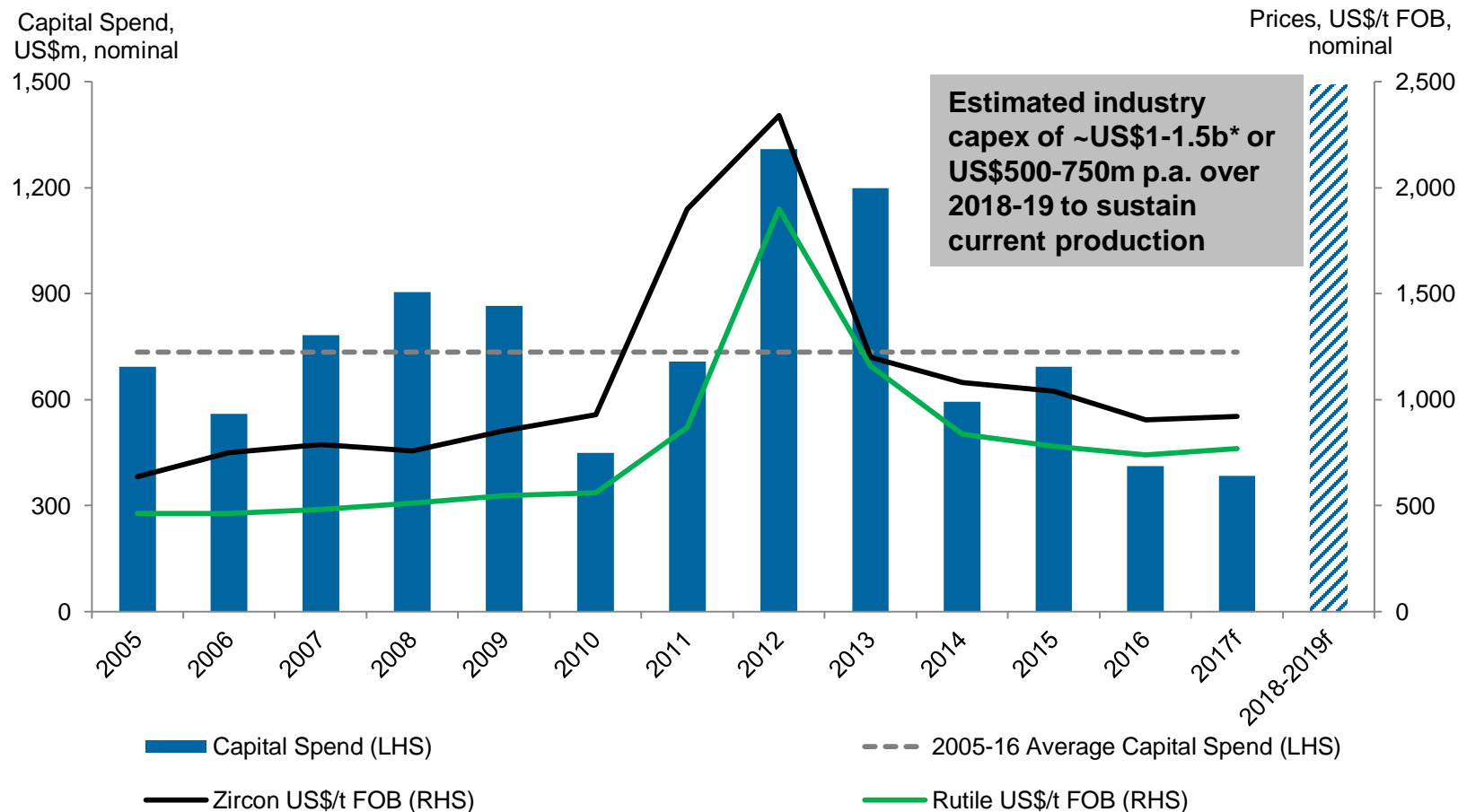
# Global Mineral Sands Production



\* 2016 product volumes and 2016 industry average prices

All titanium feedstock volumes in TiO2 units  
Source: Company reports, Iluka and TZMI

# Capital Required to Sustain Industry Production



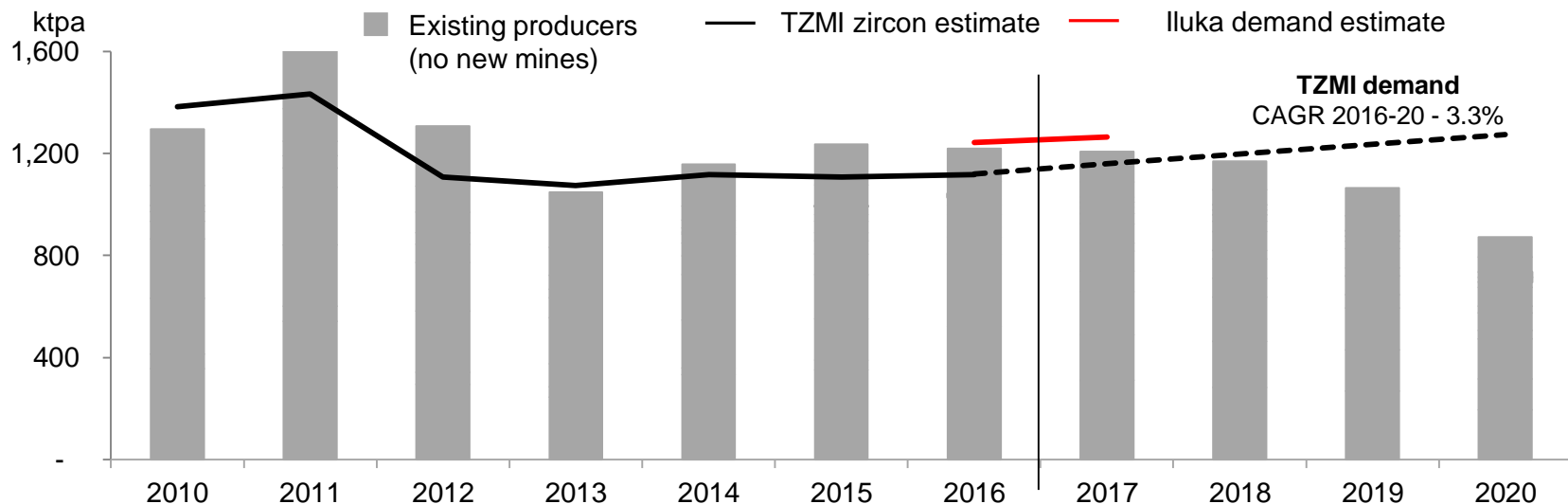
Source: Iluka and company reports

\* Relates to major existing producers, not potential new projects

# Global Zircon Supply - Demand

- Zircon from existing producers declining due to depletion and grade/assemblage decline
- Inventory largely depleted
- Varying demand estimates
  - Iluka estimates demand based on industry supply and inventory movements
  - TZMI's demand differs from Iluka's view
- From 2011, demand has fallen by 200-250kt due to modernisation, substitution and thrifting, predominantly in the ceramics sector
- Likely supply response from Kalimantan artisanal producers

## Zircon Supply and Demand – Existing producers, no new production



# New Project Supply Challenges

Unconventional deposits requiring technical solutions (eg. fine minerals, depth, product quality)

Zircon and rutile typically induced as by-products of ilmenite projects

Limited high zircon and rutile assemblage projects

Higher unit costs due to grade, distance to infrastructure and other factors

Higher sovereign risk locations

Iluka evaluates many projects and will remain disciplined in allocating capital.

In a tightening market, new projects may progress despite challenges.

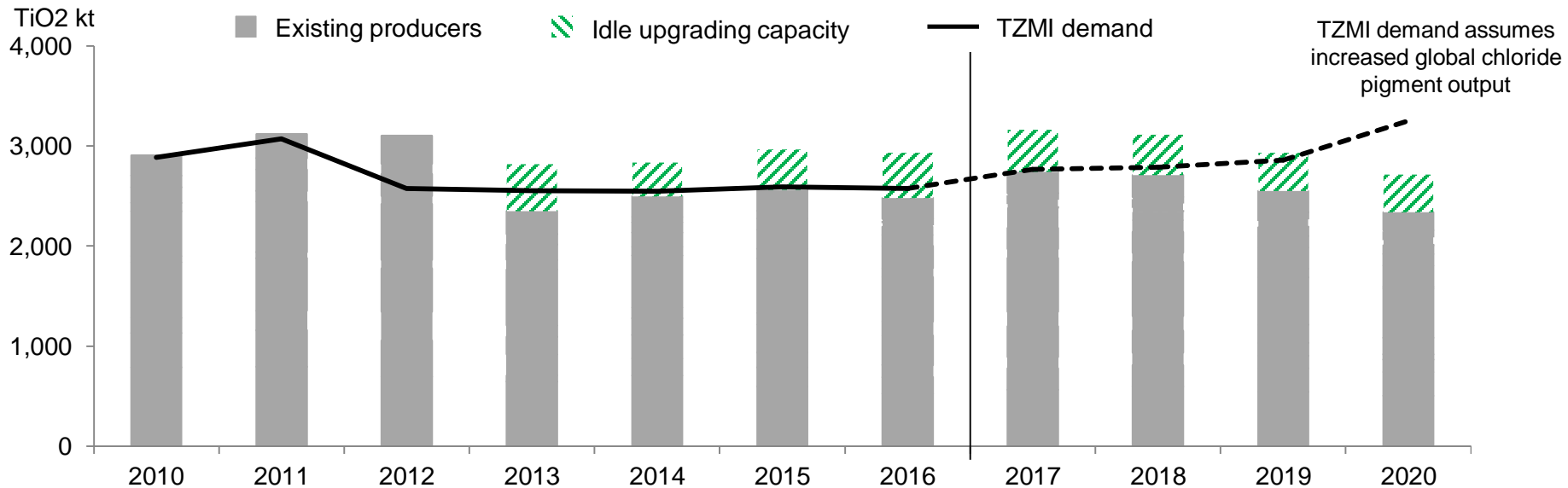


# High Grade Titanium Dioxide Supply/Demand



- Supply-demand overlaid with upgrading capacity not requiring additional mine investment
- This capacity has remained idle for some time
- Additional idle upgrading capacity (not shown) requires investment in ilmenite mines
- Highlights importance of Iluka's strategy to secure offtake for Cataby

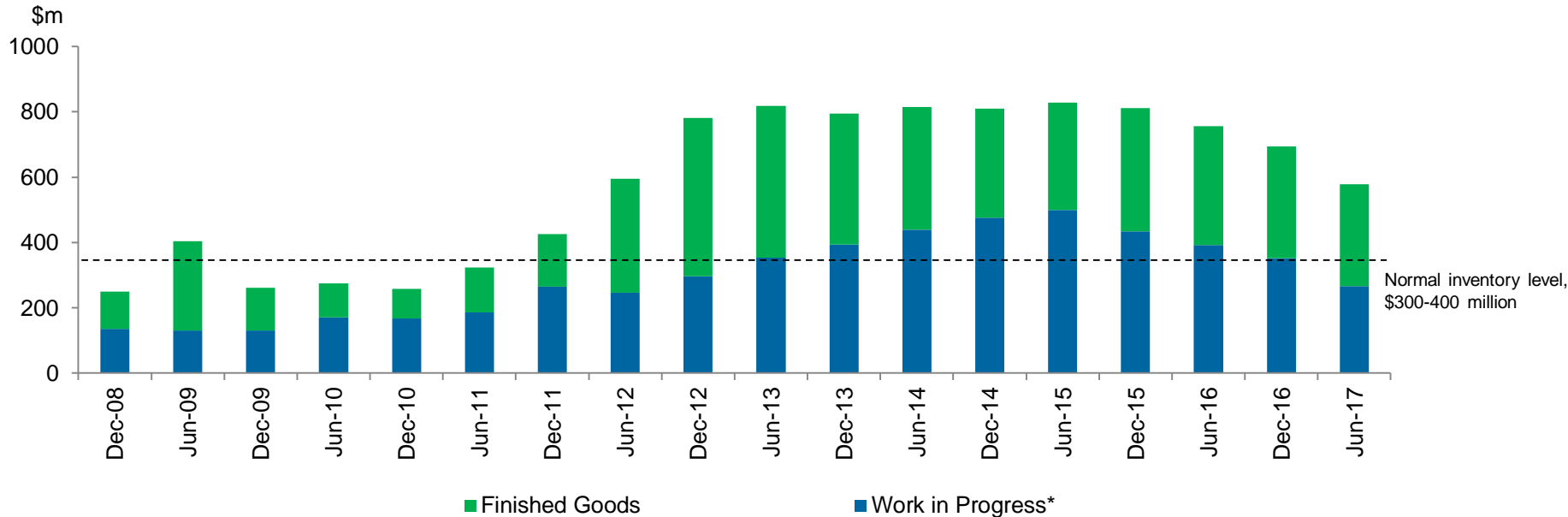
## High Grade Titanium Supply and Demand – Existing producers and swing capacity



This slide should be read in conjunction with the disclosure in respect of forward looking statements on slide 2  
 Source: Iluka supply and TZMI demand August 2017

# Inventory Movement

## Total Inventory



- Total inventory reduced by \$116 million in H1 2017 to \$578 million (31 Dec 2016: \$694 million)
- Sierra Rutile inventory \$52 million at June 2017 (Dec 2016: \$34 million)
- Subject to market conditions, planned inventory reduction to normal level within 12 months
- Inventory held at cost, with cash generation from inventory drawdown reflecting sales prices at the time



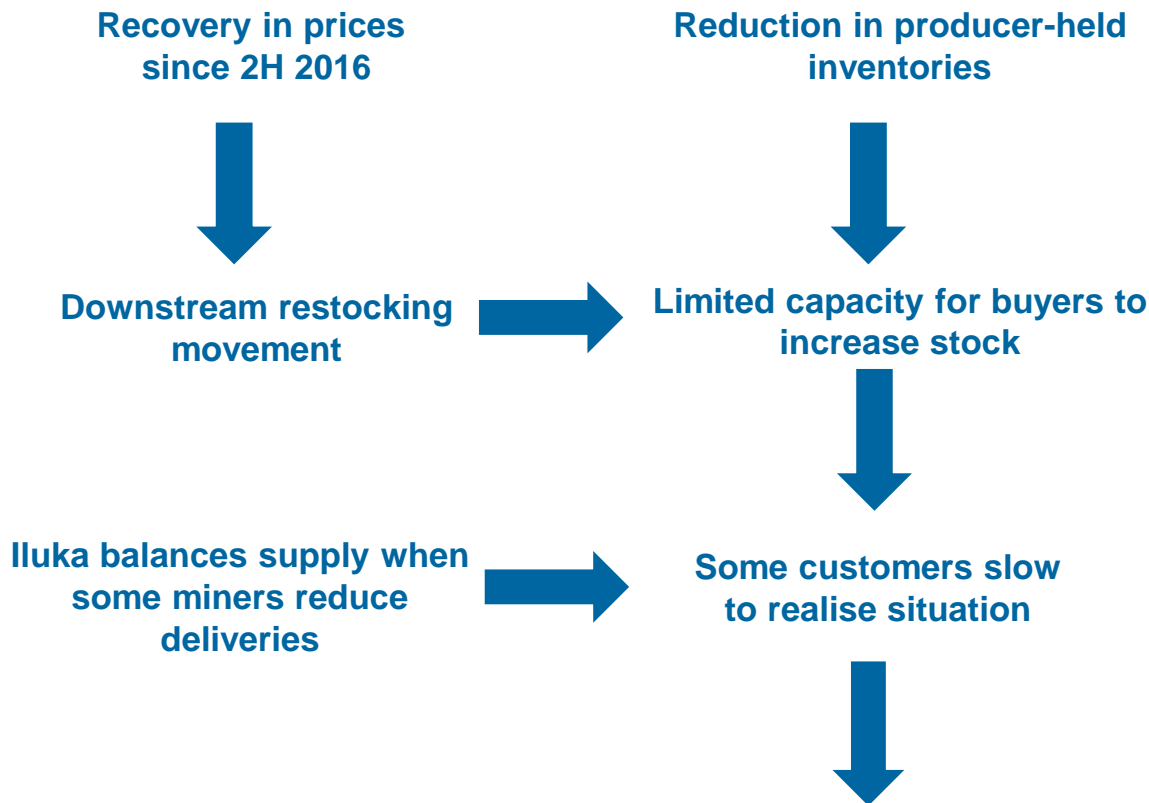
# Zircon Market

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# Current Supply Demand Fundamentals Positive

## Zircon market tightness has arrived



No inventory build up + limited producer response + some demand cannot be met + modest underlying growth  
= favourable conditions

# Zircon Market 2017

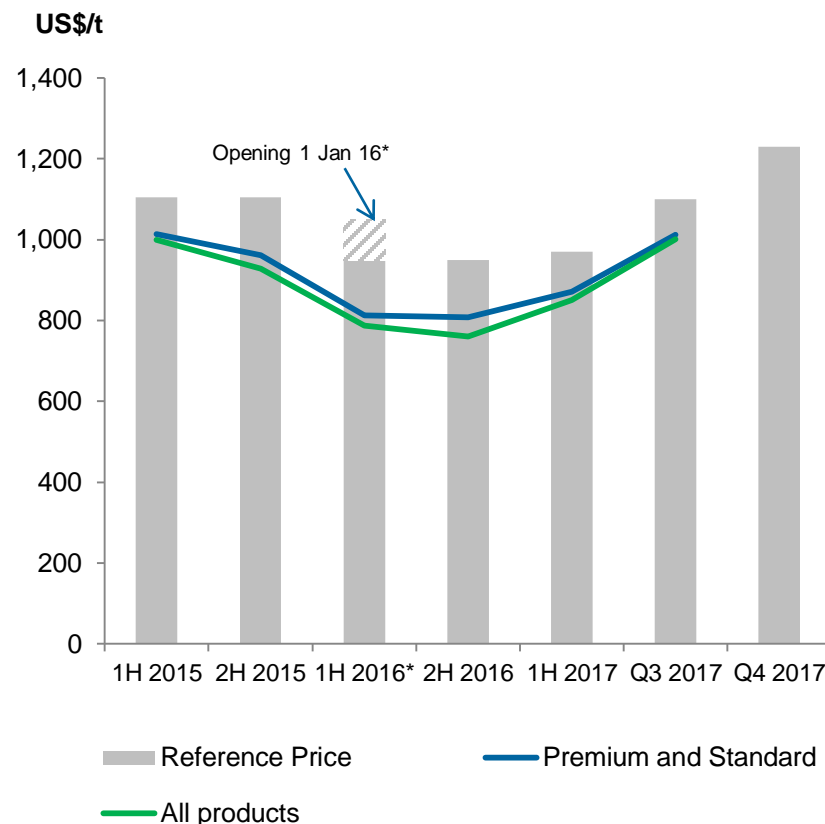
## Pricing

- H1 2017 weighted average premium and standard received price up 7% relative to H1 2016
- Increase to Reference Price of US\$130/t to US\$1,100/t from 1 July 2017 announced
- Further price increase of US\$130/t to US\$1,230/t announced for 6 months from 1 October 2017
- “Inducement” pricing minimal with realized FOB price approaching reference price

## Supply and demand

- Reflects
  - Underlying market conditions
  - Restocking from depleted levels
- Increased demand for premium products
- Moderate market growth expected
- Limited ability for existing producers to respond in short term

## Zircon Prices\*



\* Notes: 'Premium and Standard' and 'All products' prices are weighted average received price, FOB. 'Reference Price' is based on a 2 tonne bag of Zircon Premium, DAT, ex-China warehouse. During 1H 2016 reference price decreased from US\$1050/t to US\$950/t.

## Although substitutes exist, zircon is the better product

### Zircon attributes

- Opacity – whiteness
- Hardness
- Low thermal expansion
- High melting point
- Low thermal conductivity
- Chemically inert
- Low neutron absorption



- Alumina
- Feldspar
- Kaolin
- Chromite
- Synthetic Mullite

**Adoption of substitutes has value-in-use and technical limitations**

# Substitution Landscape

| Market     | Application          | % of zircon market (est) | Major Substitute   | Adoption Hurdle | Mitigation  |
|------------|----------------------|--------------------------|--|-----------------|---|
| Ceramics   | Body                 | 16                       | Calcined alumina; white clays; white feldspar; kaolinite | Medium          | Alumina content in tile formulation<br>Final product attributes (e.g. porosity, dimensions)<br>Declining availability and quality of ceramic clay and feldspar deposits             |
|            | Engobes & glazes     | 27                       | Calcined alumina   | Medium/<br>High | Alumina content in tile formulation<br>Final product quality (e.g. water mark, melting point, chemistry, gloss)<br>Increasing demand for higher-quality and HD digital glazed tiles |
|            | Ceramic frits        | 9                        | Nil  | High            | Zircon's effects unmatched by any substitutes   |
| Chemicals  | Pigments (zirconia)  | 20                       | Nil  | High            | ZrO <sub>2</sub> 's effectiveness to provide crystal encapsulation for specific colours   |
|            | Medical Applications |                          | Nil  | High            | Highly specific functions   |
|            | Advanced materials   |                          | Nil  | High            | Highly specific functions (e.g. fuel rods, oxygen sensors, high-temperature turbine coatings)   |
| Refractory | Glass refractory     | 16                       | Nil  | High            | Highly specific function<br>High-impact failures if cheaper substitutes fail  |
|            | Steel refractory     |                          | High-purity alumina; spinel                              | Medium/<br>High | High-impact failures if cheaper substitutes fail  |
| Foundry    | Sand-casting         | 2                        | Synthetic mullite; chromite                              | Low             | Limitation in performance of substitutes (e.g. desired high-level surface finish and chilling effects)  |
|            | Coatings             | 10                       | Alumina; synthetic mullite                               | High            | Limitations in performance of substitutes (e.g. high refractoriness and resistance to molten metal)   |
|            | Precision Casting    |                          | Fused silica; WFA; synthetic mullite                     | High            | Limitations in performance of substitutes ( e.g. surface finish quality, coating slurry instability)  |

Adoption Hurdle

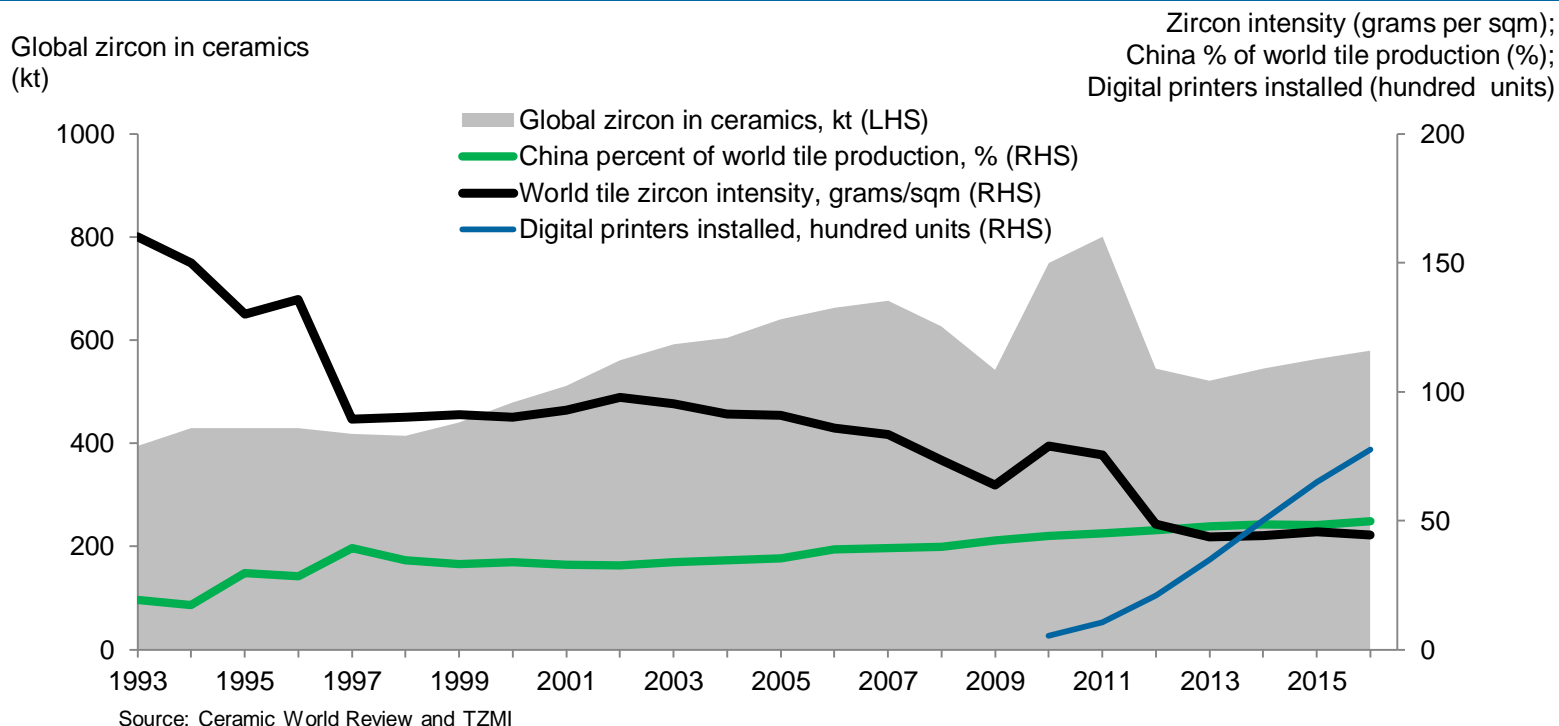
Low = Likely requires only in-house competencies to trial and implement the change. Change could likely be achieved in less than a year. Low economic risk.

Medium = Focussed effort needed, external specialist knowledge may be required. Change may require between one to three years.

High = Technical limitations, Deep and specialised technical knowledge to study, trial or implement the changes. May require more than three years of efforts. High potential economic risk from any trials.

# Ceramics Zircon Intensity

**Substitution of zircon appears to have reached technical limit and rise of digital printing is supporting zircon intensity in tiles**



- Decline of zircon intensity in ceramics has now stabilised
- Modernisation, thriftiness and substitution by the ceramics industry in 2011-12 reached technical limits
- Growth of digital printing remains positive development for zircon consumption (supports intensity of use)
- Digital printing could bring better quality tiles (higher zircon content) to traditionally low quality markets (India/Brazil)
- Trend towards higher quality tile products positive for zircon (both volume and value-in-use)





# Titanium Market

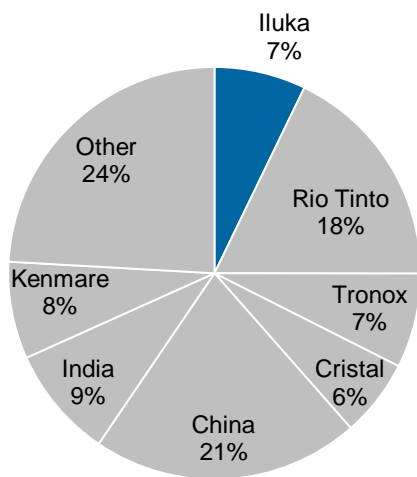
**ILUKA**



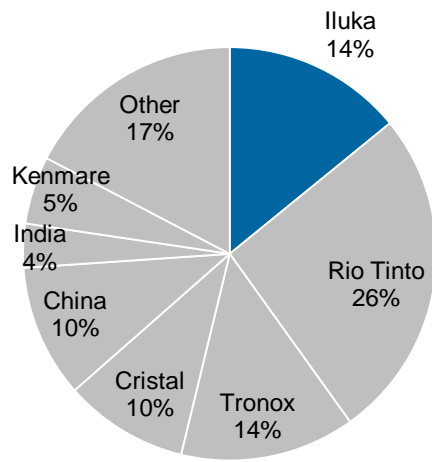
# Market Position Strongest in Very High Grade



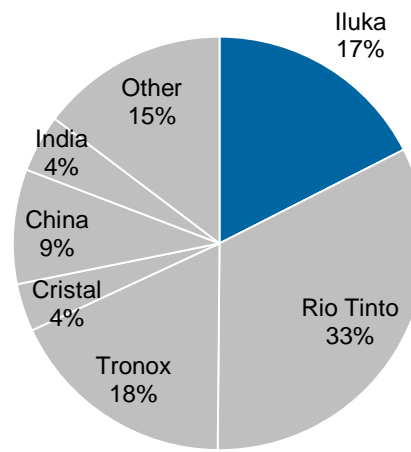
**Total TiO<sub>2</sub> Feedstock Chloride & Sulphate (2016 ~6.4 Mt)**



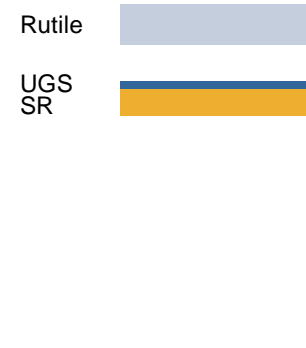
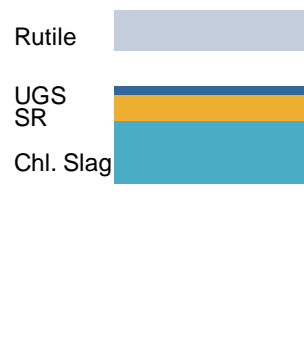
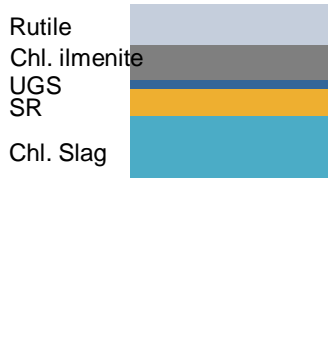
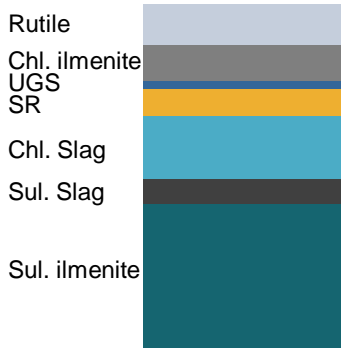
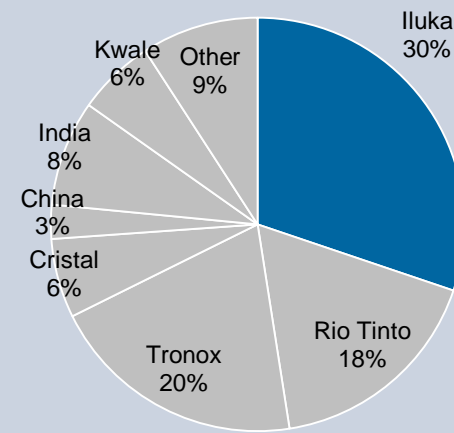
**Chloride Feedstock (2016 ~3.3 Mt)**



**High Grade Chloride (80%+ TiO<sub>2</sub>) Feedstocks (2016 ~2.5 Mt)**



**Very High Grade Chloride (90%+ TiO<sub>2</sub>) Feedstocks (2016 ~1.3 Mt)**



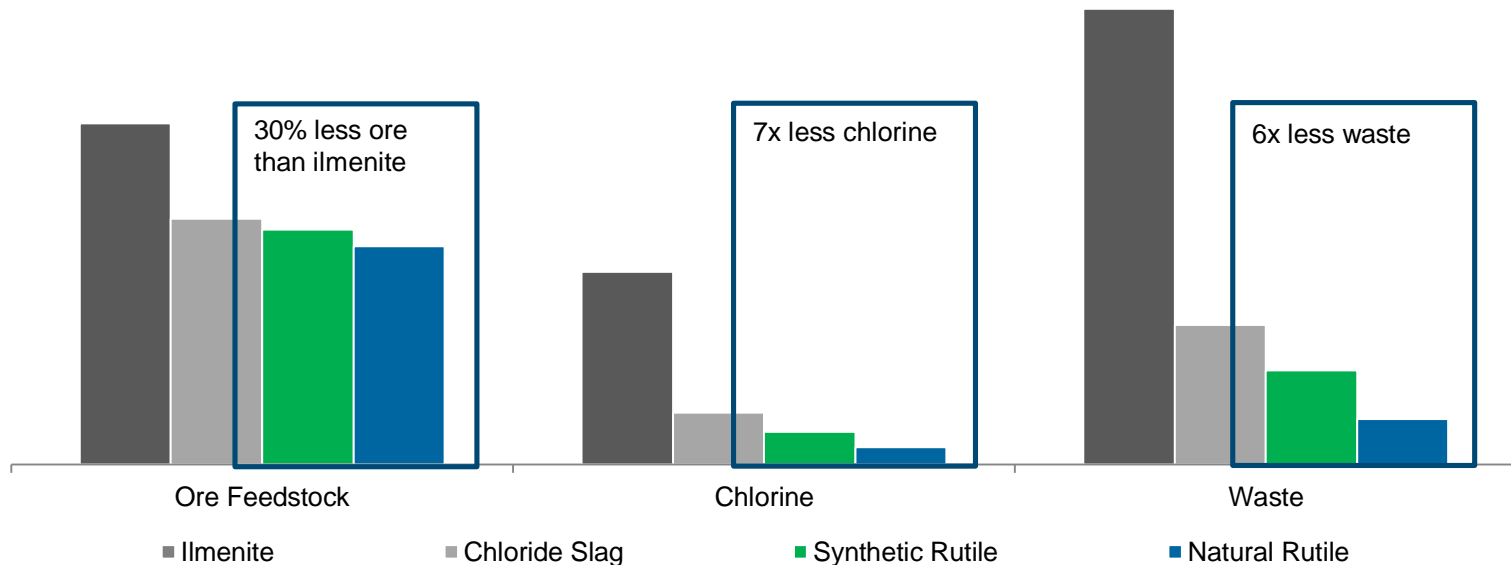
Note: Iluka production includes Sierra Rutile (acquired December 2016)

Source: TZMI, Company reports, Iluka

# High Grade TiO<sub>2</sub> Feedstock Advantage

- Natural and synthetic rutile have a higher titanium grade than most slag feedstocks
- Advantages in pigment production:
  - lower ore tonnes required;
  - lower chlorine input cost; and
  - lower waste generation (environmental and cost benefits).
- High 'value in use' for Iluka's main products

Higher grade feedstocks have lower costs, per tonne of pigment produced



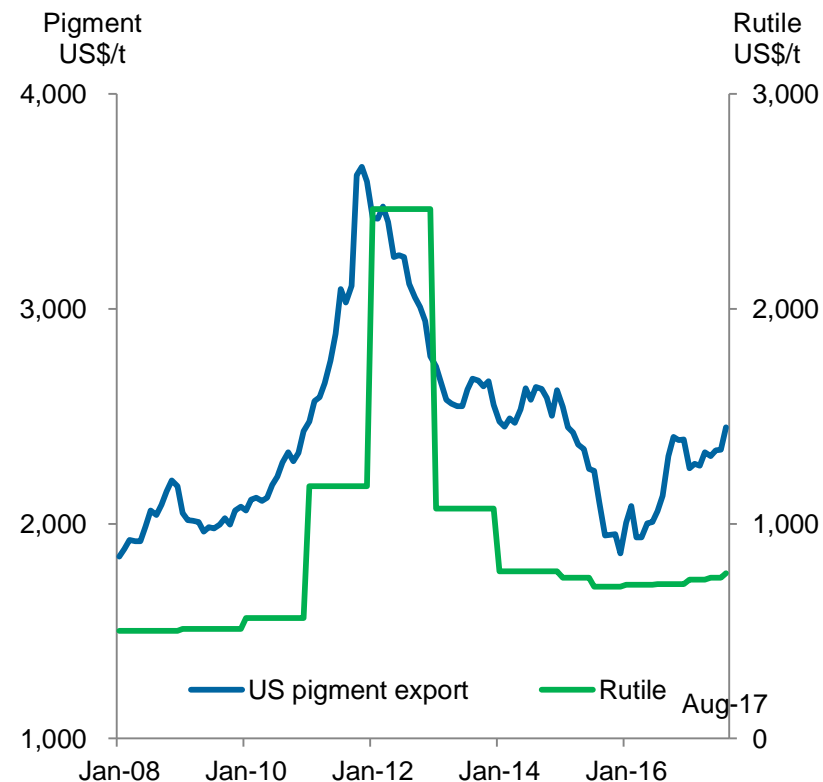
# High Grade Feedstock Market

## Pricing

- H1 2017 rutile prices up 4% relative to H1 2016
  - 40% of SRL's 2017 rutile production volumes (~60kt) contracted at fixed prices for 2017
- Successful implementation of US\$70-100/t increase effective 1 July on uncontracted rutile volumes
- Pigment prices up ~10% since beginning of 2017
  - typical lag of 6-12 months to feedstock price

## Pigment market update

- Broad-based, continuing improvement in chloride pigment market
  - commentary of above trend demand
- Continued restocking of depleted pigment inventories
  - feedstock demand expected to exceed underlying market conditions
- Potential for pigment plants to increase high grade feed (rutile and synthetic rutile) to deliver higher plant output



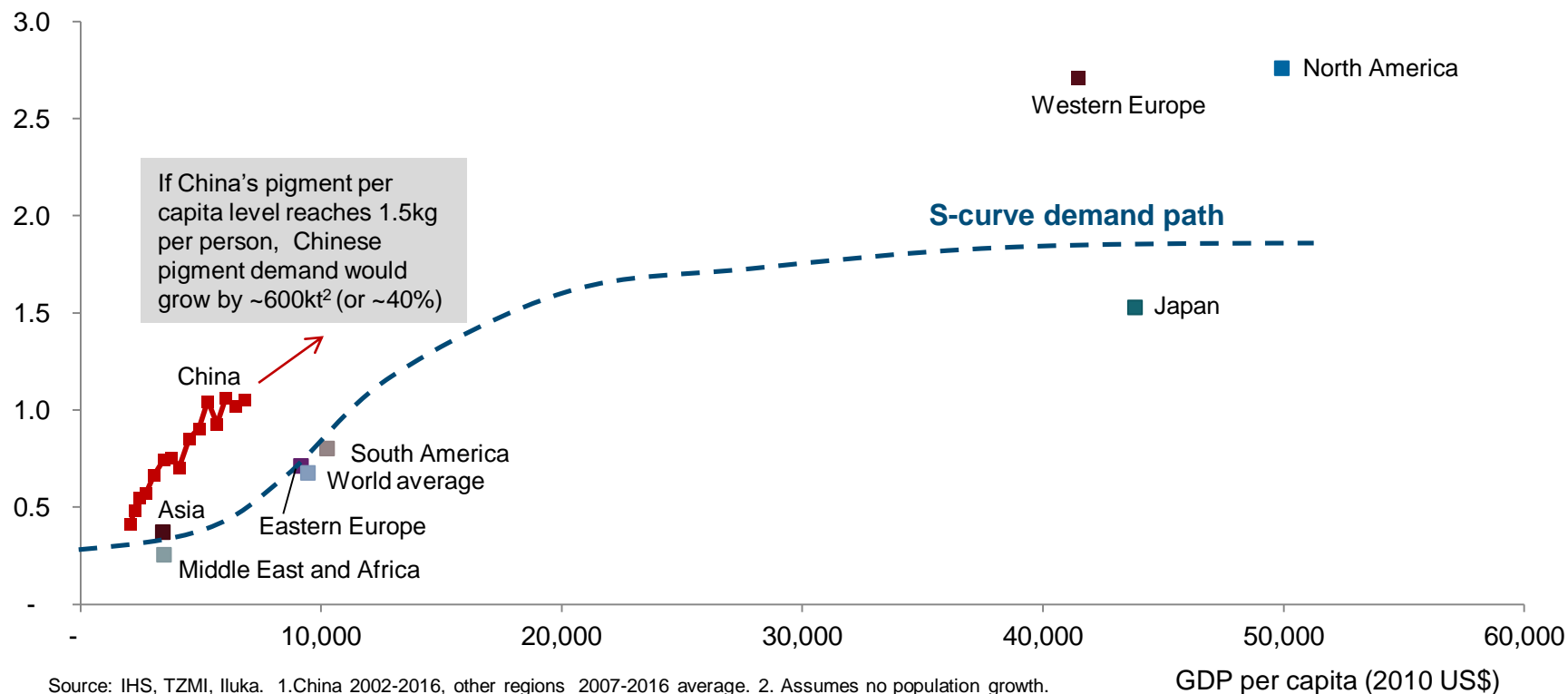
Source: TZMI and Iluka

# Pigment Use Grows with Income

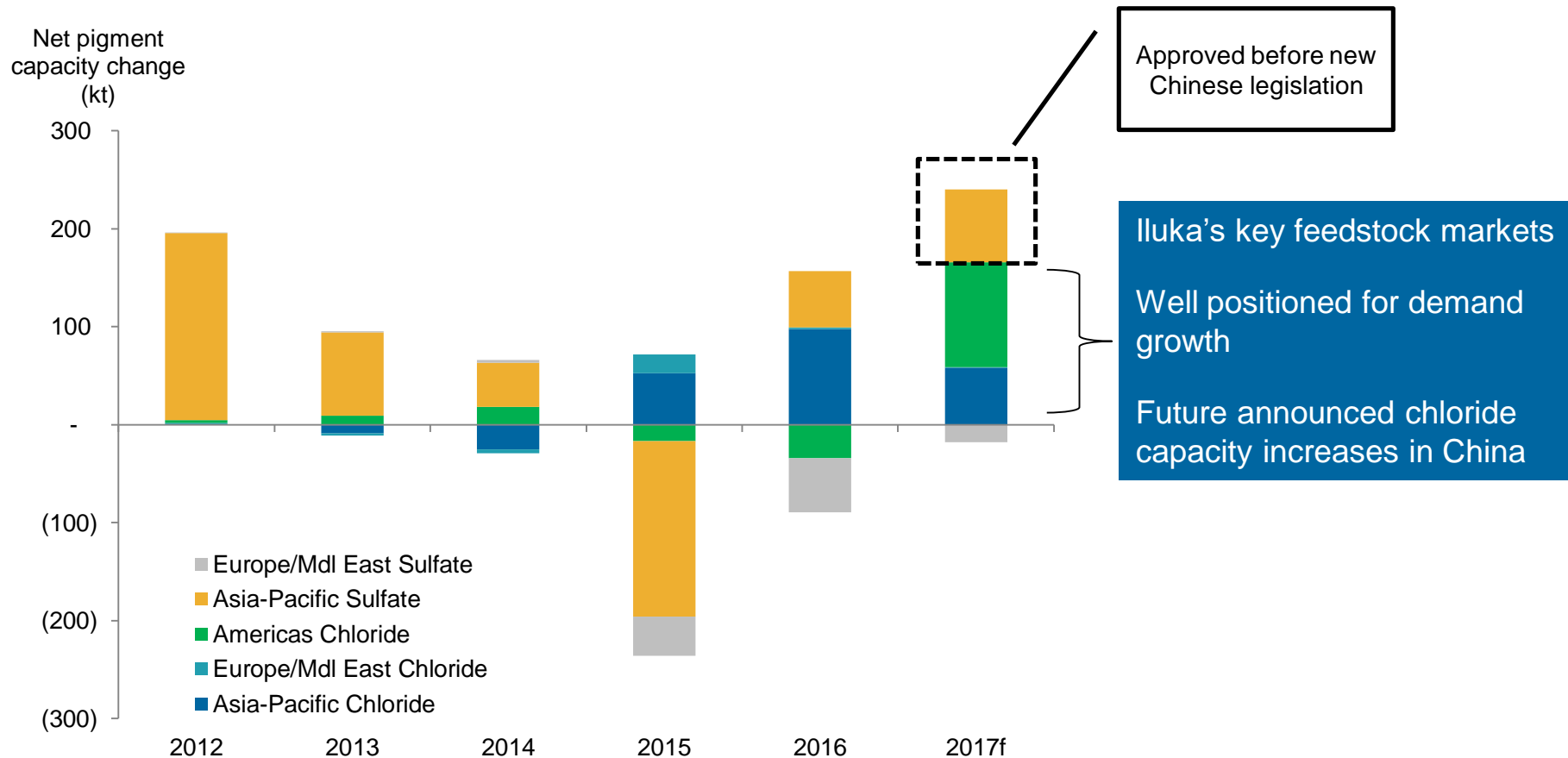
- Pigment demand growth per capita follows typical 's-curve' pattern
- Further per capita growth to come in China and other developing economies

**Pigment use per capita follows S-curve commodity demand path with GDP per capita<sup>1</sup>**

Pigment per capita (kg)



# Pigment Industry Technology Waves



Source: TZMI

# Long Term Trends Support Our Industry





**ILUKA**



Jacinth-Ambrosia, South Australia