



# INTEGRATED INNOVATION

August/September 2017

tharisa





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# THARISA AT A GLANCE

## Innovative

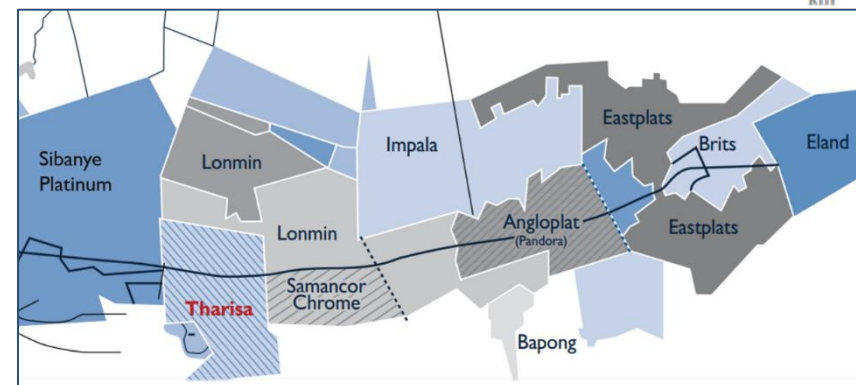
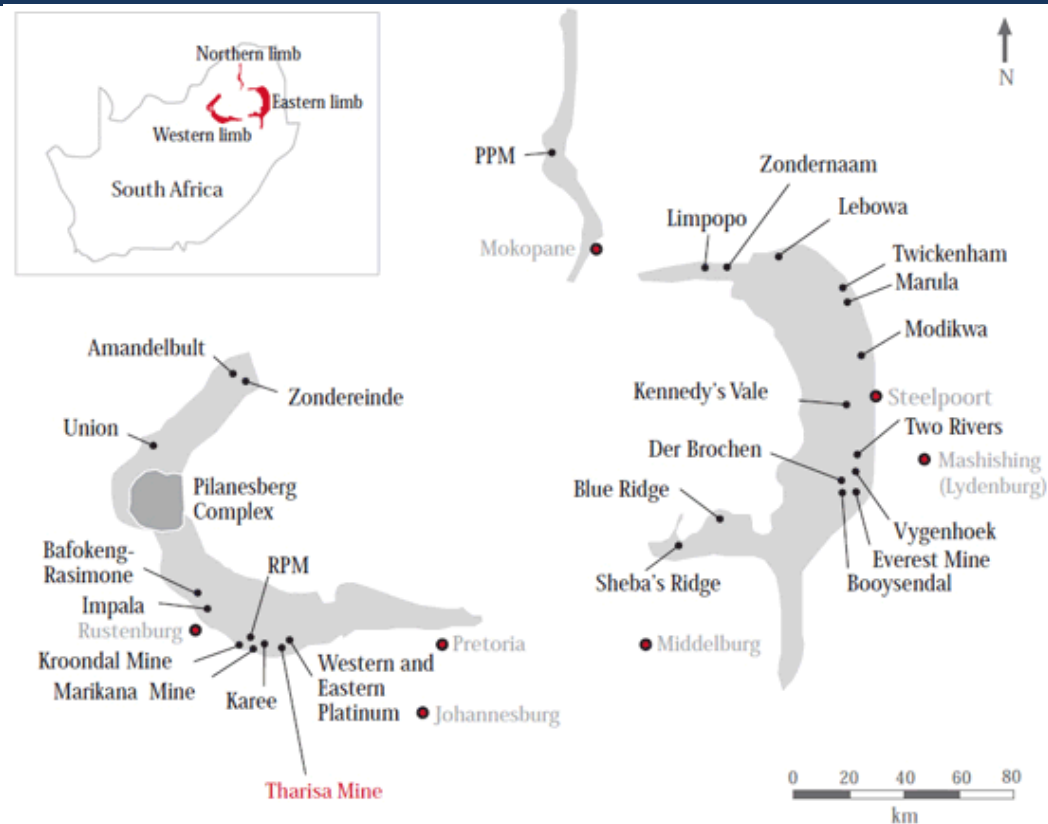
- Strategically positioned as a low cost a **co-producer** of PGM and chrome concentrates
- Mine **5 MG chromitite reef layers**
- **Large scale open pit** operation with 18 years open pit LOM + 40 year underground extension
- Benefit from controlling an integrated **mine-to-market value chain**

## Established

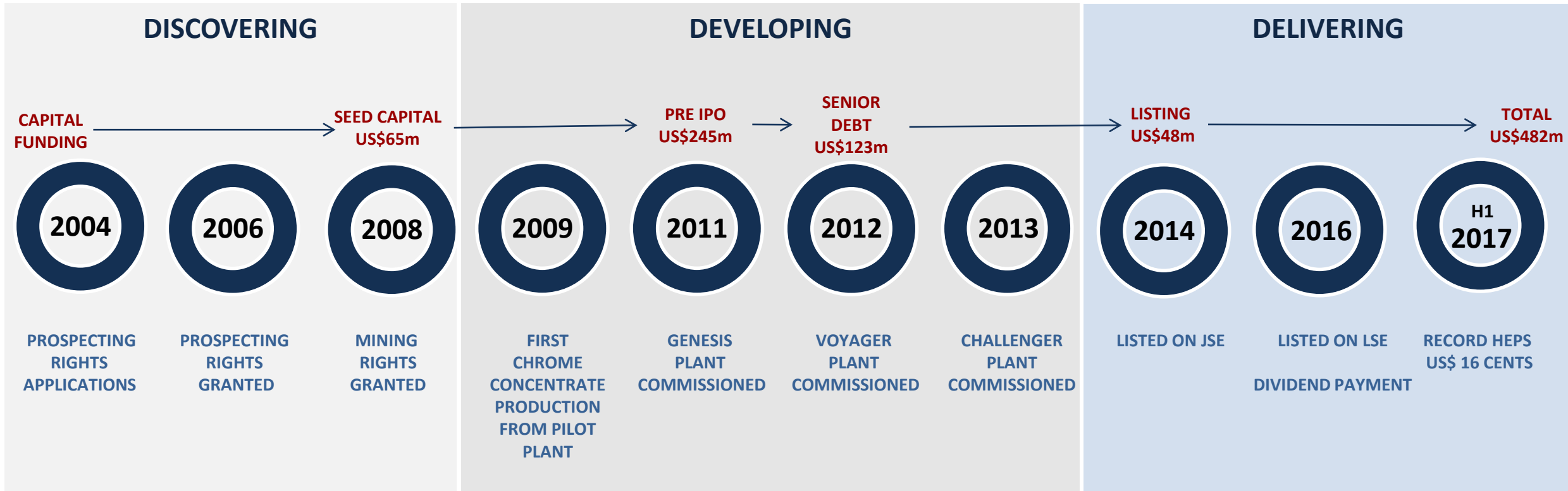
- **11 years** old, listed on JSE and LSE
- One of the world's **single largest resource** of chrome
- Will produce **147.4 koz PGMs** and **1.3 Mt chrome** concentrates in 2017
- Are the **fifth largest producer** of chrome concentrate
- Derisked with **major mine development capital investment** already complete

## Focused

- **Lowest cost** quartile in PGM and chrome industry
- **Cash generative**, dividend payer
- A **solid platform** underpinned by an optimised operating model
- **Profitable** in all commodity environments



# THARISA'S JOURNEY



Mining 4.8 Mtpa  
 PGM concentrate of 147.4 kozpa  
 Chrome concentrates of 1.3 Mtpa



# OUR OPERATIONS





## THARISA MINERALS

### RESOURCE

877.7 Mt resource  
98.9 Mt reserve of which 80.2 Mt open pit

### MINING

18 year open pit LOM  
40 year underground extension

### PROCESSING

400 ktpm nameplate capacity  
Genesis Plant (100 ktpm)  
Voyager Plant (300 ktpm)

### LARGE SCALE

One of the world's largest single chrome resources

### MECHANISED

Mechanised open pit mining with a skilled and small labour force

### DERISKED

In production, major capex complete  
Steady state production of 147.4 koz PGMs and 1.3 Mt of chrome concentrates

**MID TIER OPEN PIT PGM AND CHROME CONCENTRATE CO-PRODUCER WITH AN INTEGRATED MARKETING, SALES, AND LOGISTICS PLATFORM**

## ARXO METALS

### BENEFICIATION

Production of specialty grade chrome concentrates

### R&D

New technology assessment

## ARXO RESOURCES/DINAMI

### MARKETING AND SALES

Significant trader of chrome concentrates to China  
Global reach for specialty chrome concentrates

## ARXO LOGISTICS

### LOGISTICS

Road/rail transport, warehouse and port facilities for bulk chrome concentrates  
Road transport of PGMs

## CUSTOMERS

### AGREEMENTS

PGM offtake – Impala Platinum  
Specialty offtake/agency – Rand York Metallurgical agency – Tisco and the Noble Group  
Relationships with stainless steel and ferrochrome producers

# MINING FIVE MG SEAMS

## RESOURCES AND RESERVES

Steady state mining rate of 5.0 Mtpa with an average stripping ratio of 9.7 (m<sup>3</sup>:m<sup>3</sup> basis)

### MINERAL RESOURCE

- 877.7 Mt
- 1.58 g/t 6PGE+Au
- 20.5% Cr<sub>2</sub>O<sub>3</sub>

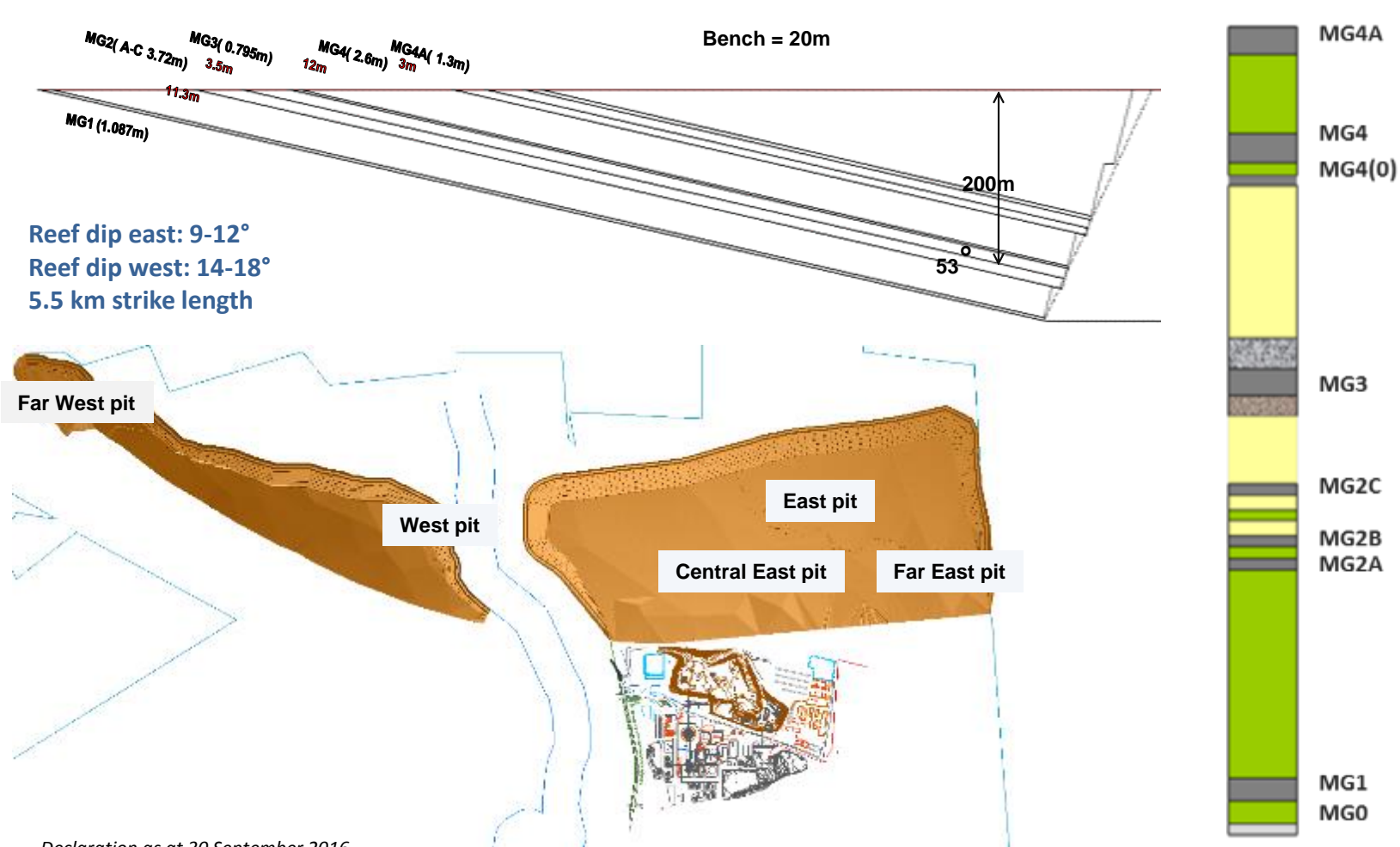
### MINERAL RESERVE

- 98.9 Mt
- 1.50 g/t 5PGE+Au
- 20.1% Cr<sub>2</sub>O<sub>3</sub>

### OPEN PIT MINERAL RESERVE

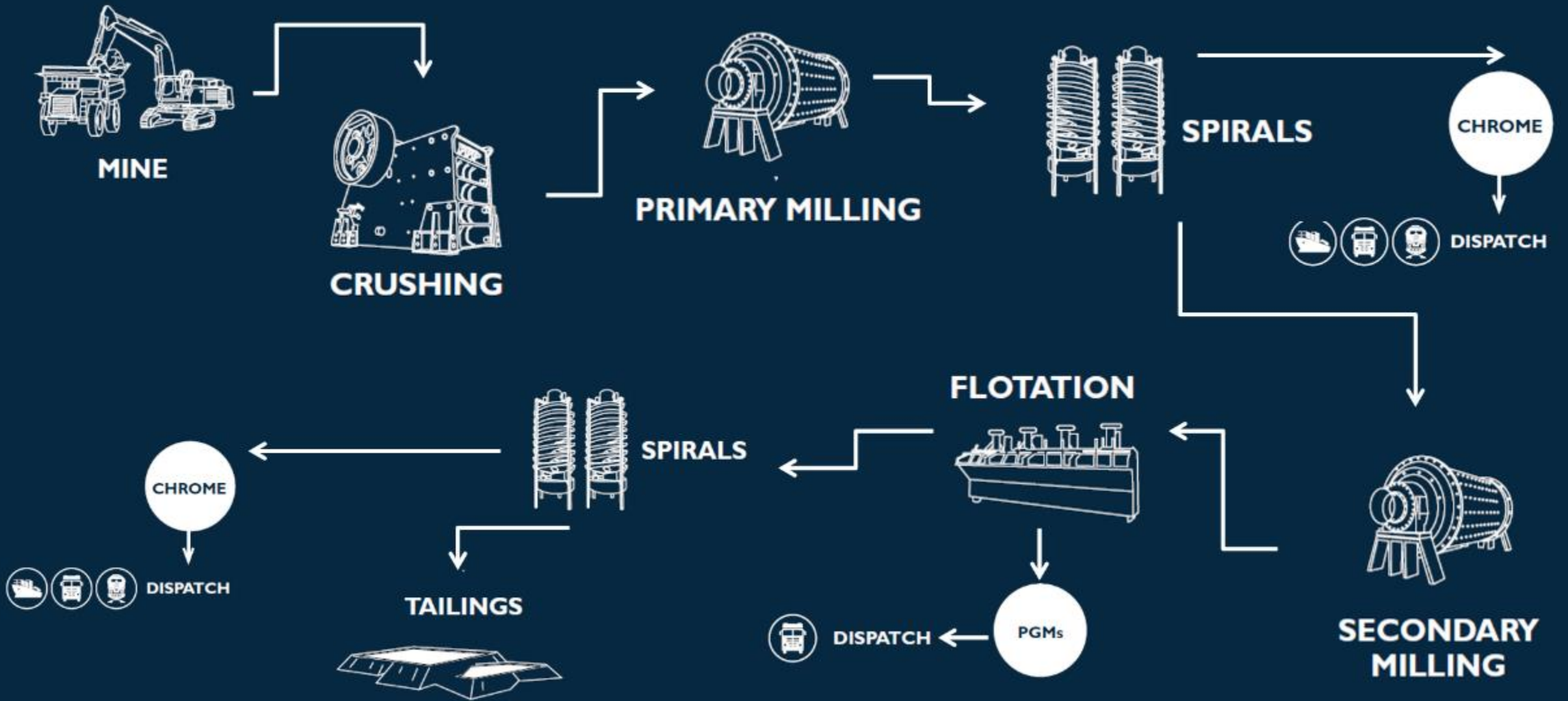
- 80.2 Mt
- 1.49 g/t 5PGE+Au
- 20.3% Cr<sub>2</sub>O<sub>3</sub>

## GENERALISED CROSS SECTION SHOWING THE MG CHROMITITE LAYERS AT PLANNED DEPTH



Declaration as at 30 September 2016

# INNOVATIVE APPROACH





# YTD OPERATIONAL HIGHLIGHTS

SPECIALTY CHROME PRODUCTION  
239.6 kt  
(\*2016: 187.3 kt) ↑ 27.9%

## REEF MINED

↑ 3.6%

**3 724.3 kt**

(\*2016: 3 594.0 kt)

## PGM PRODUCTION

↑ 11.9%

**104.6 koz**

(\*2016: 93.5 koz)

## CHROME CONCENTRATE PRODUCTION

↑ 6.5%

**970.7 kt**

(\*2016: 911.5 kt)

## REEF MILLED

↑ 6.7%

**3 616.8 kt**

(\*2016: 3 389.2 kt)

## PGM RECOVERY

↑ 19.8%

**79.3%**

(\*2016: 66.2%)

## CHROME RECOVERY

↑ 3.0%

**64.3%**

(\*2016: 62.4%)

# OPERATIONAL PERFORMANCE YTD

		Quarter ended 30 Jun 2017	Quarter ended 31 Mar 2017	Quarter on quarter movement %	Quarter ended 30 Jun 2016	Nine months ended 30 Jun 2017
Reef mined	kt	1 275.2	1 219.2	4.6	1 235.4	3 724.3
Stripping ratio	m <sup>3</sup> waste/m <sup>3</sup> reef	6.9	7.5		7.4	7.8
Reef milled	kt	1 199.1	1 211.3	(1.0)	1 192.2	3 616.8
PGM flotation feed tonnes	kt	866.0	897.9	(3.6)	929.6	2 648.9
PGM rougher feed grade	g/t	1.57	1.56	0.6	1.64	1.55
6E PGMs produced	koz	35.4	34.3	3.2	33.5	104.6
PGM recovery	%	81.3	76.2	6.7	68.5	79.3
Average PGM contained metal basket price	US\$/oz	792	783	1.1	745	771
Average PGM contained metal basket price	ZAR/oz	10 443	10 355	0.8	11 162	10 352
<b>Cr<sub>2</sub>O<sub>3</sub> ROM grade</b>	%	17.8	17.5	1.7	17.7	17.6
<b>Chrome recovery</b>	%	66.0	62.5	5.6	61.6	64.3
<b>Chrome yield</b>	%	27.8	26.0	6.9	25.8	26.8
<b>Chrome concentrates produced</b>	kt	333.9	314.6	6.1	307.1	970.7
<b>Metallurgical grade</b>	kt	246.8	239.2	3.2	225.6	731.1
<b>Specialty grades</b>	kt	87.1	75.4	15.5	81.5	239.6
<b>Metallurgical grade chrome concentrate contract price</b>	US\$/t CIF China	147	338	(56.5)	105	212
<b>Metallurgical grade chrome concentrate contract price</b>	ZAR/t CIF China	1 892	4 430	(57.3)	1 589	2 844
<b>Average exchange rate</b>	ZAR:US\$	13.2	13.2	-	15.0	13.5



# OUR FINANCIALS

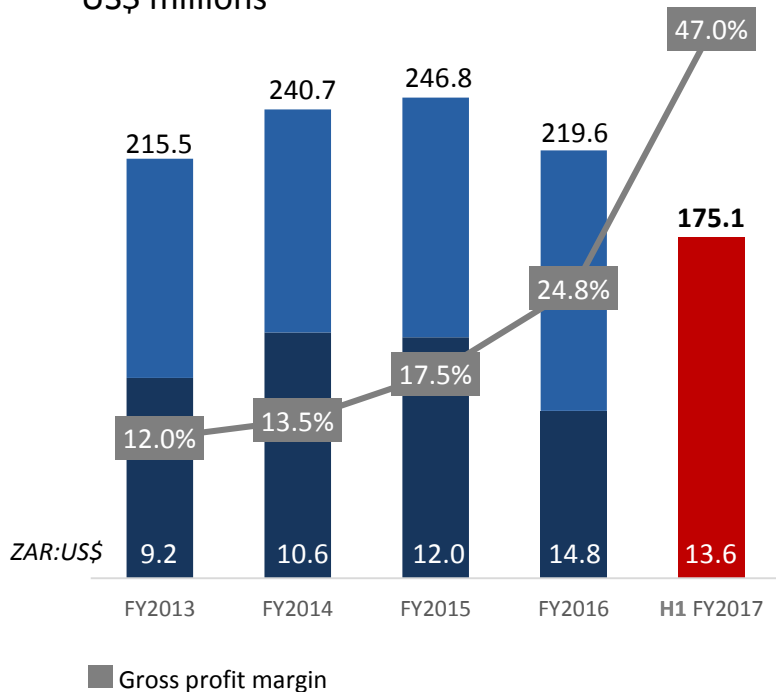


# STRONG FINANCIAL PERFORMANCE

## GROUP REVENUE

↑ 103.6%

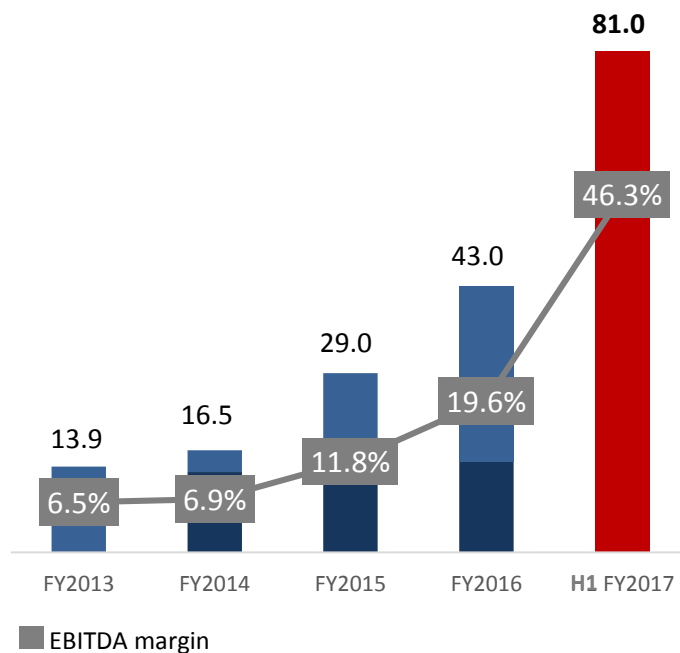
US\$ millions



## EBITDA

↑ 451.0%

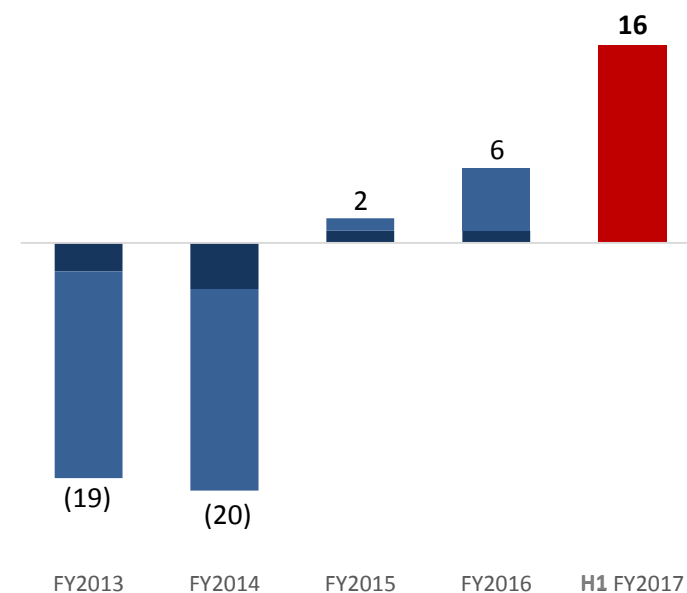
US\$ millions



## HEPS

↑ 1 500.0%

US\$ cents





# INCREASING MARGINS

PGM SHARED COSTS

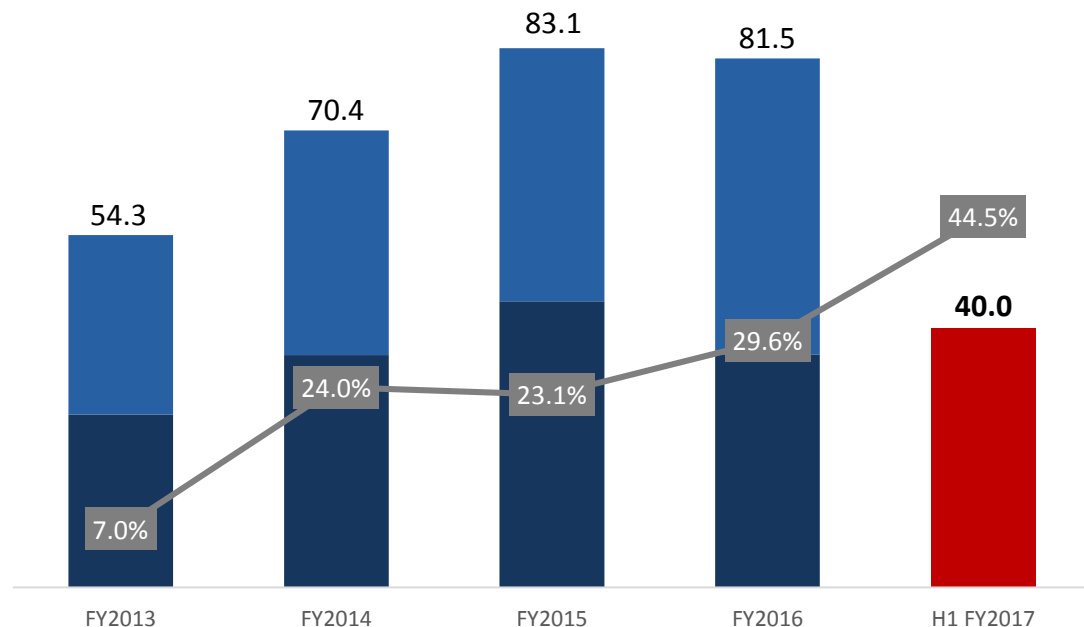
25%  
(2016: 50%)

CHROME SHARED COSTS

75%  
(2016: 50%)

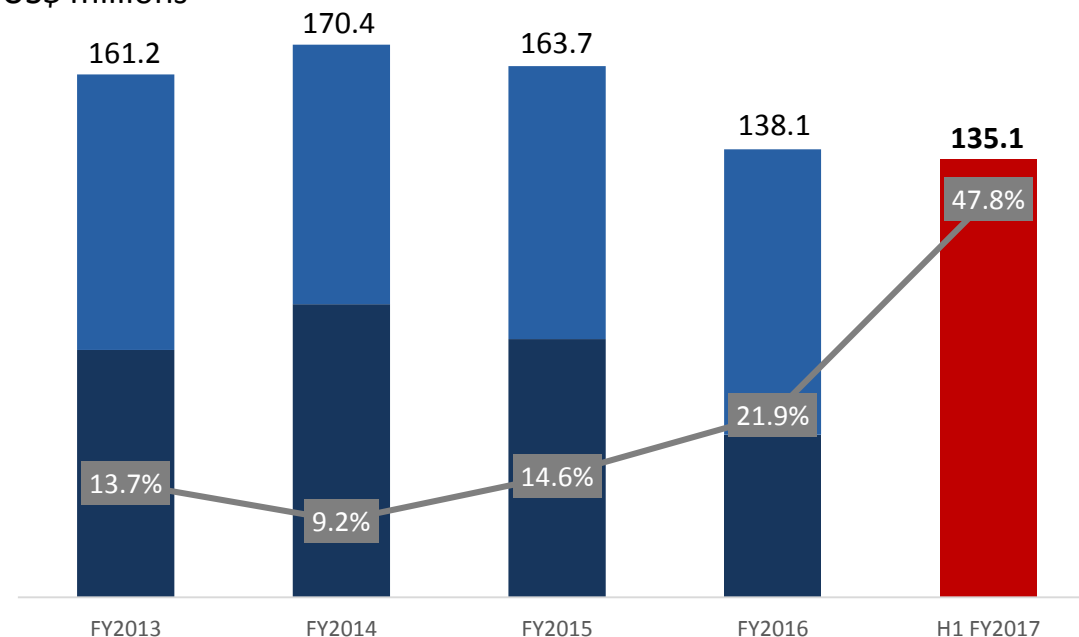
## PGM REVENUE AND GROSS PROFIT MARGIN

US\$ millions



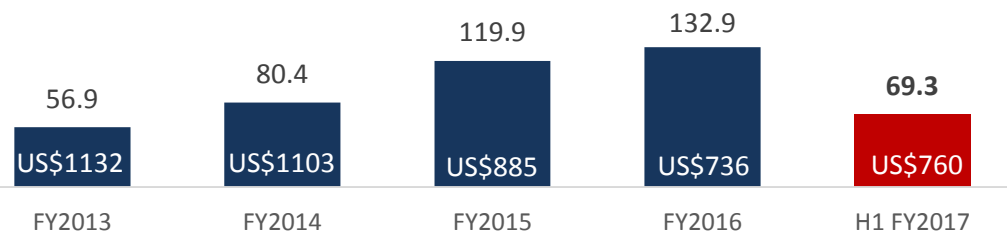
## CHROME REVENUE AND GROSS PROFIT MARGIN

US\$ millions



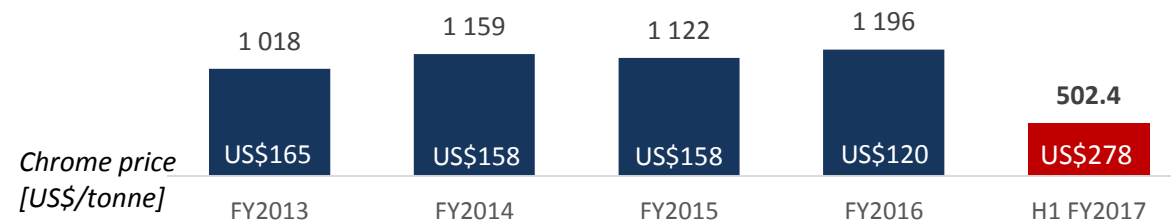
## PGM SALES VOLUME [koz]

PGM price  
[US\$/oz]



## CHROME CONCENTRATE SALES VOLUME [kt]

Chrome price  
[US\$/tonne]



# COSTS IN THE LOWEST QUARTILE

STRIPPING RATIO

8.4 m<sup>3</sup>:m<sup>3</sup>  
(2016: 6.8 m<sup>3</sup>:m<sup>3</sup>)

AVERAGE EXCHANGE RATE

ZAR:US\$

13.6

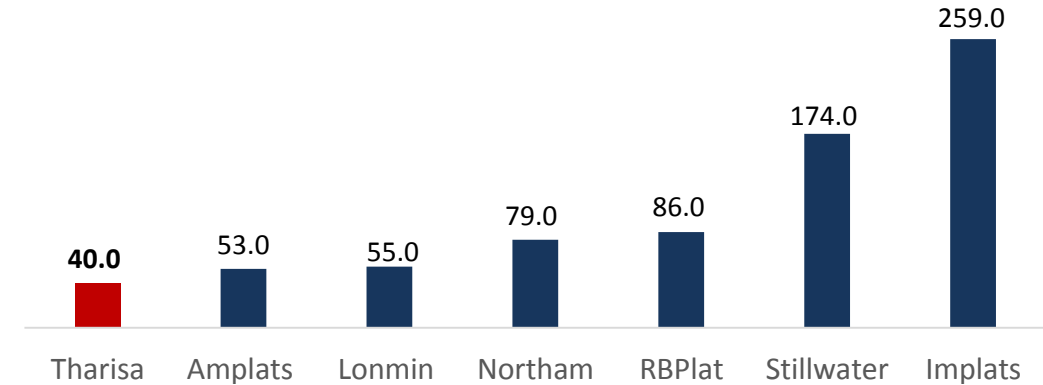
(2016: 15.0)

↓9.3%

## UNIT COSTS

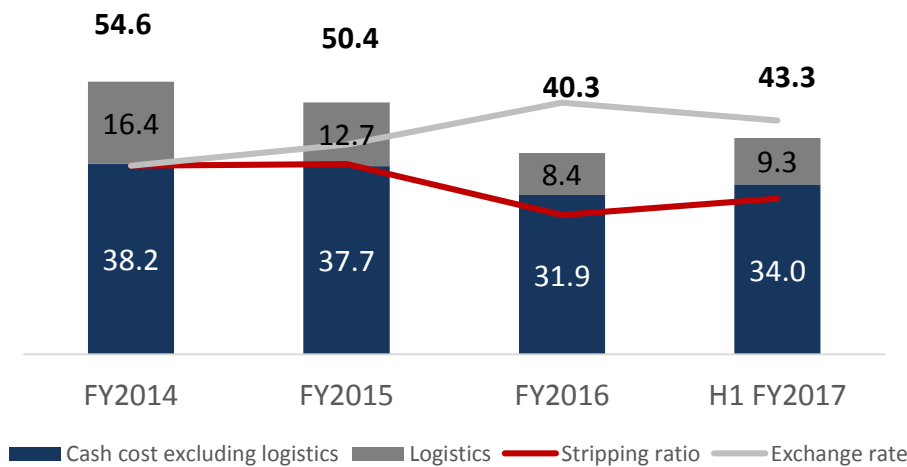
	H1 FY2017	H1 FY2016	Change
All in cost per Pt ounce sold	(1 123)	402	-
All in cost per 42% chrome tonne sold	88	85	3.5%

## CASH COST PER TONNE MILLED (US\$)



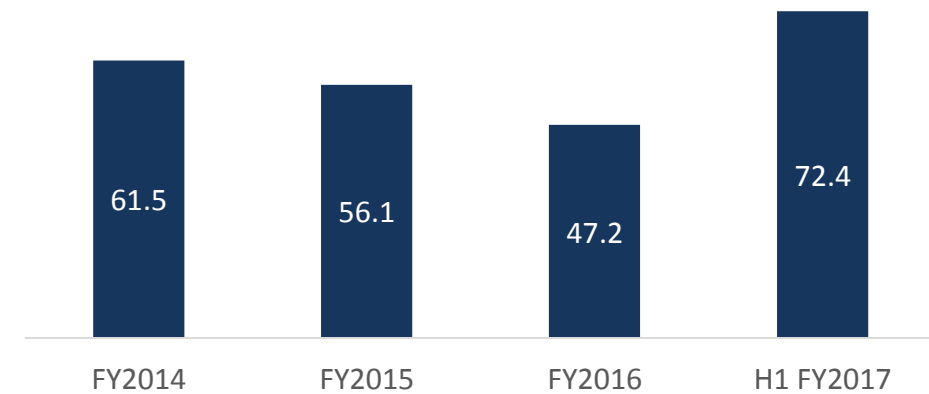
## CONSOLIDATED CASH COST PER TONNE MILLED

US\$/tonne milled



## REVENUE PER TONNE MILLED

US\$/tonne milled





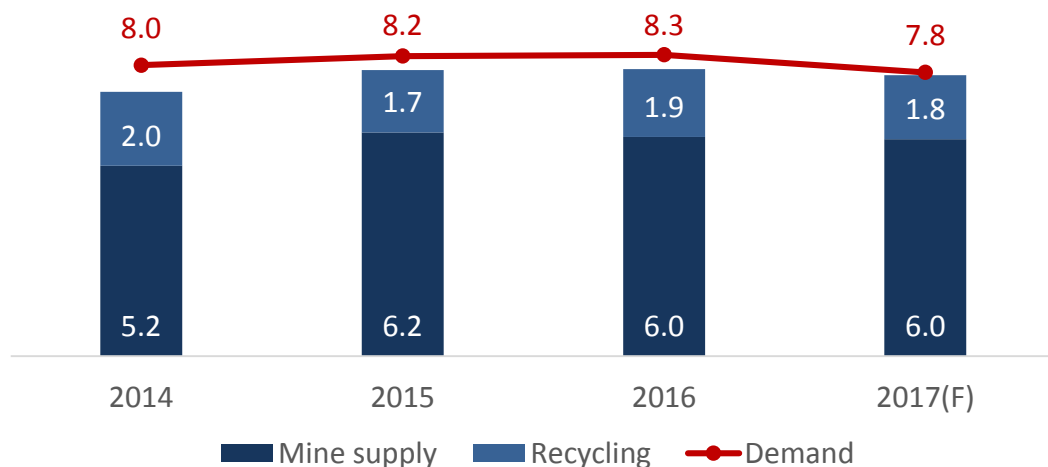
## OUR MARKETS



## PLATINUM DEMAND AND SUPPLY 2017

- Demand driven by the autocatalyst, jewellery, industrial and investment sectors
- Both primary and secondary sources of supply seen decreasing
- Primary supply weaker in 2017 due to lower prices, with lower capital investment and cost increases
- In 2017 platinum to remain in deficit by 65 koz

## PLATINUM DEMAND AND SUPPLY [Moz]

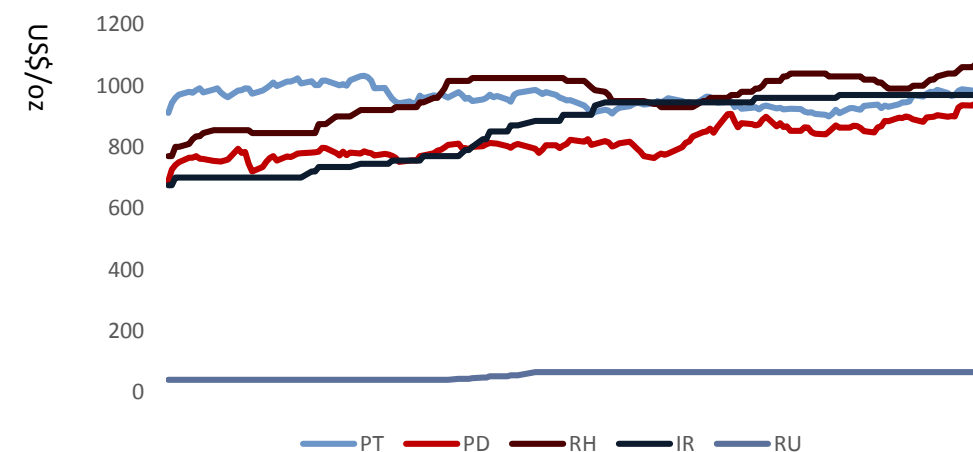


## PGM BASKET PRICES

PGM market heading for three-way price parity with platinum and palladium edging closer towards the price of iridium

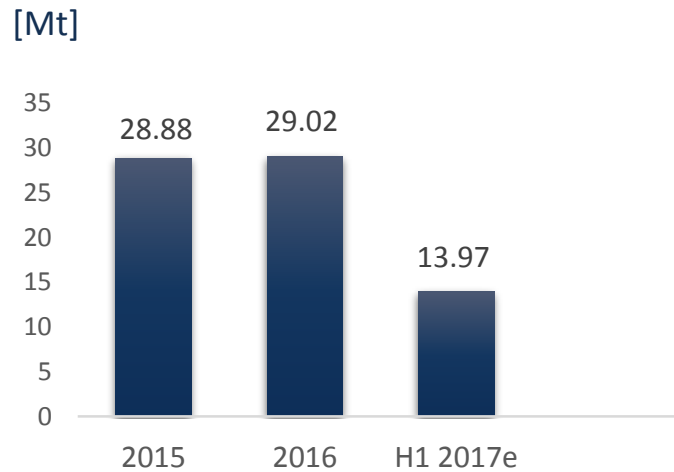
Platinum	982	US\$/oz
Palladium	938	
Ruthenium	1100	
Iridium	970	
Rhodium	65	

## PGM PRICES YTD

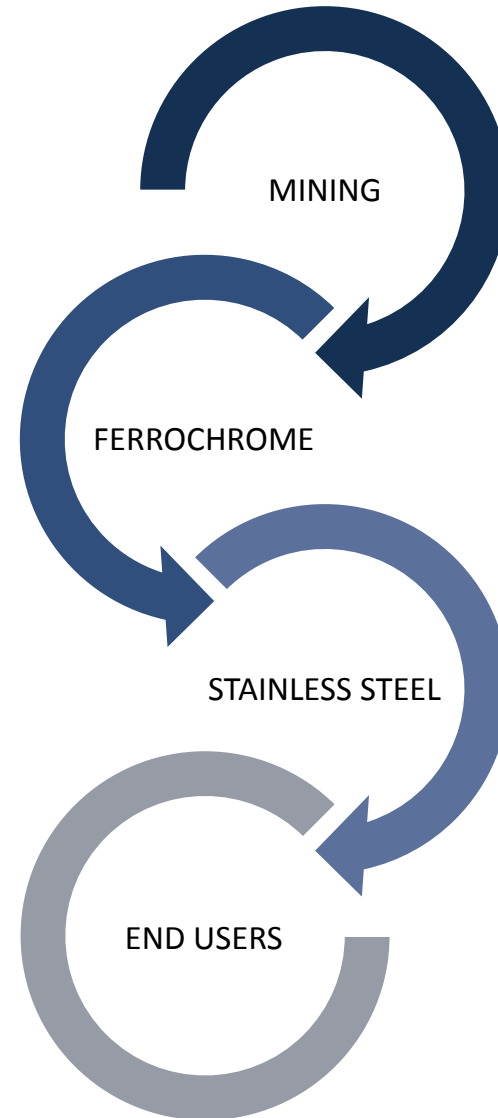
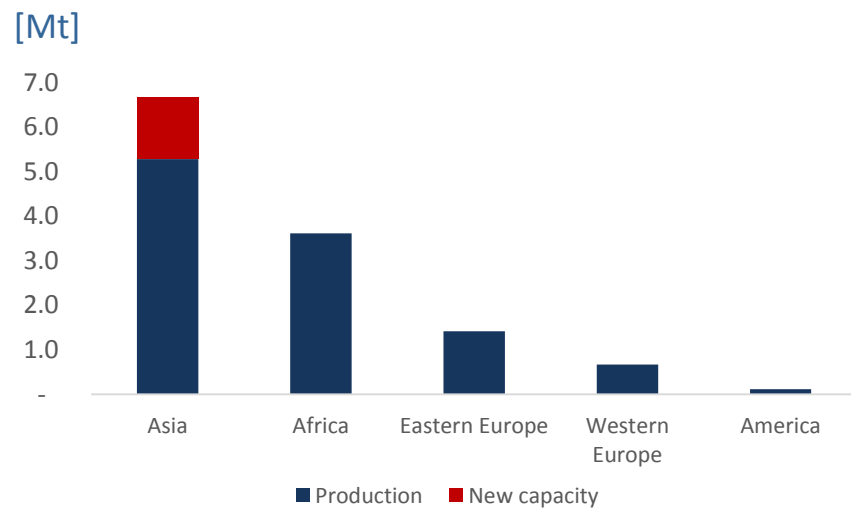


# CHROME LIFECYCLE

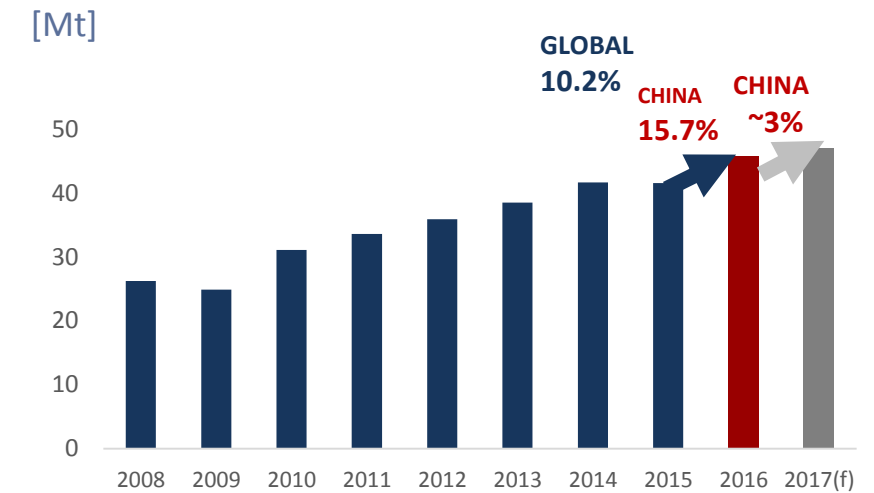
## Global Chrome Production [Mt]



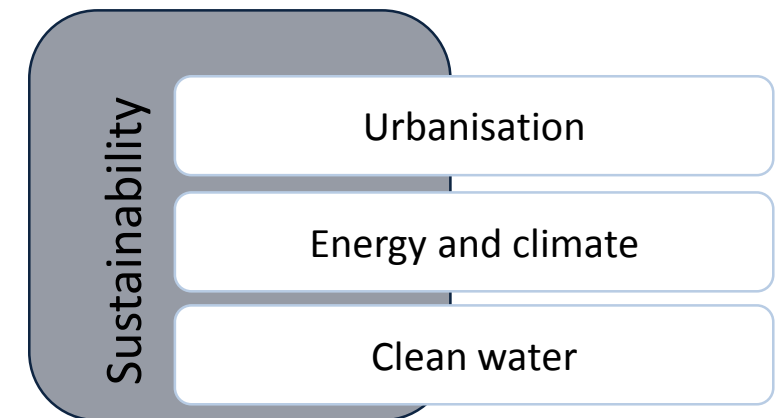
## Global Ferrochrome Production [Mt]



## Global Crude Stainless Steel Production [Mt]



## Trends Driving Stainless Steel Demand

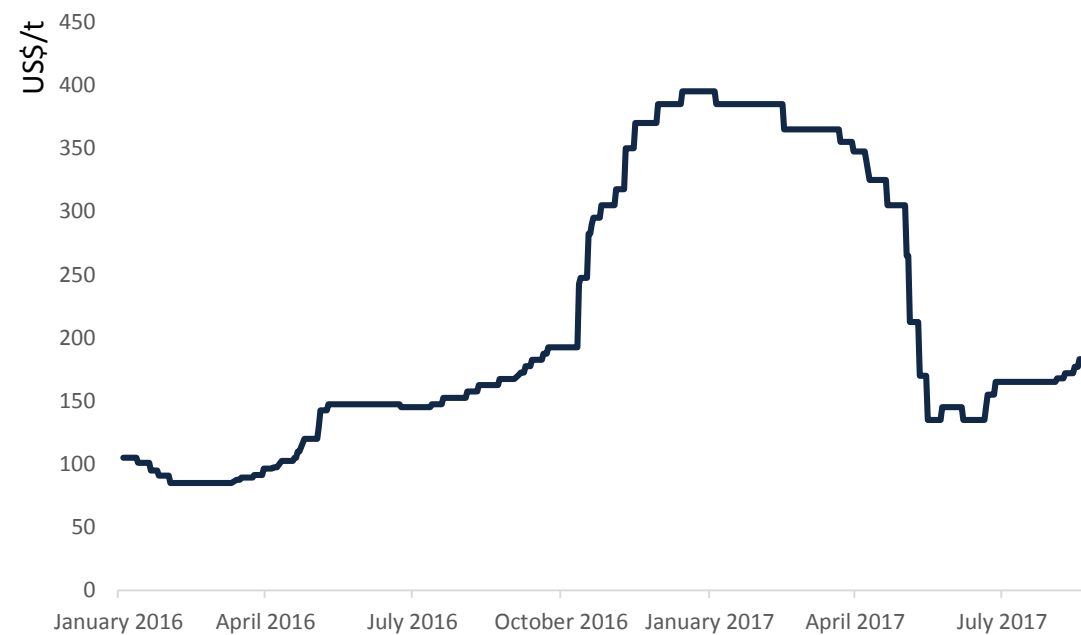




## DEMAND AND SUPPLY 2017

- Demand for metallurgical grade chrome concentrate is driven by its use in the manufacture of stainless steel, the production of which is estimated to grow at between 3% to 4% in 2017
- China is wholly dependent on imports of chrome ore/alloy
- Chrome prices were volatile at the start of 2017, peaking at US\$395 and dipping to US\$135 within four months
- Since then spot prices stabilised and more recently, started to strengthen with the latest negotiated prices at US\$220/t for delivery in October 2017
- Chrome stocks at Chinese ports are at 2.43 Mt – just over two month’s worth of stock
- About 1 million tonnes of that amount is considered “frozen stock” – stock purchased at prices of US\$250 or higher

## CHROME PRICES



# STAINLESS STEEL BY END USE SEGMENT

## Automotive & Heavy Transport

- Truck exhaust systems
- Fuel lines
- Sensors



## Infrastructure & Reticulation

- Water infrastructure
- Sewage
- Glass to metal systems
- Thermal insulation



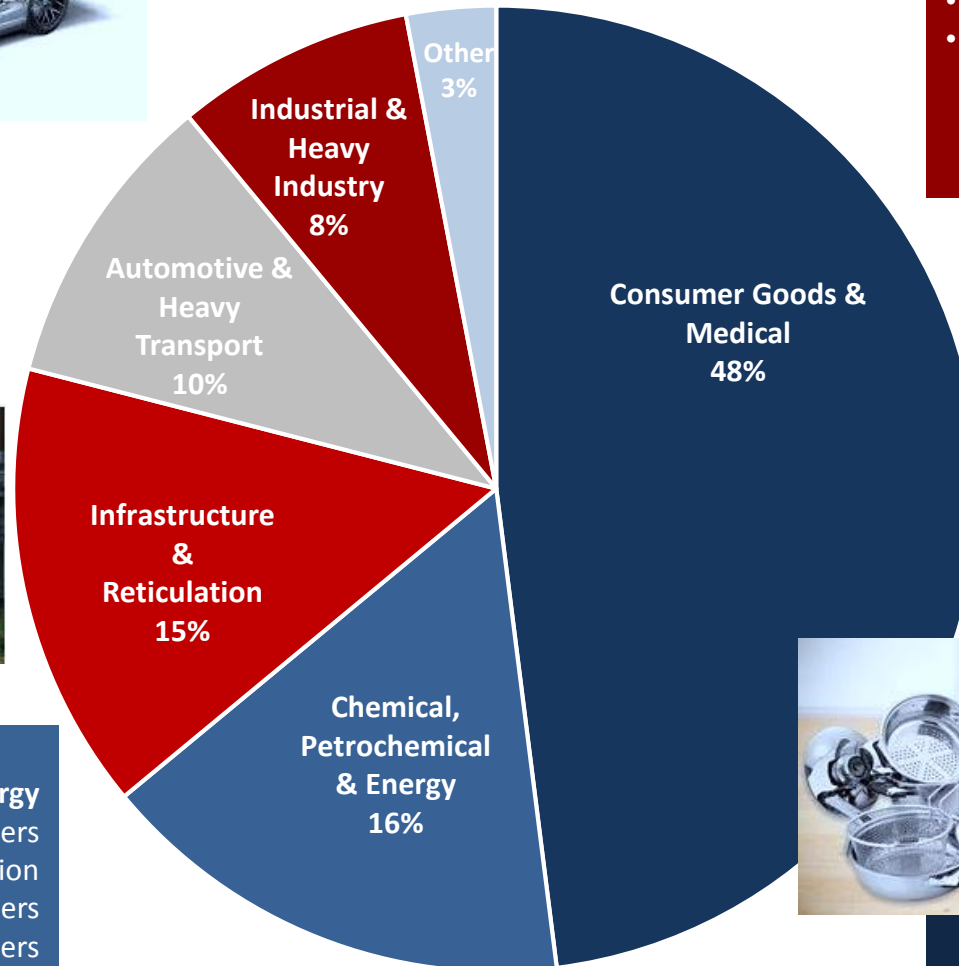
## Chemical, Petrochemical & Energy

- Tank containers
- Crude distillation
- Hydrodesulfurizers
  - Hydrofiners
  - Alkylation



## Industrial & Heavy Industry

- Recovery in pulp and paper industry
- Seawater desalination



## Consumer Goods & Medical

- Energy saving appliances
  - Washing machines
  - Microwaves
- Air conditioners
- High quality cookware
- Sterile equipment

## OUR FUTURE





# TRANSITION TO OWNER MINING

## PLAN

**Tharisa Minerals moves from contract to owner mining operating model**

- Tharisa Minerals to purchase existing contractor's fleet (equipment, strategic components, site infrastructure and spare parts)
- Contractor's employees currently deployed at Tharisa Mine to be transferred to Tharisa

## STATUS

**Conditions fulfilled, funding in place**

- Conditions, including regulatory approval, fulfilled
- Funding in place
- Replacement programme in place
- Tharisa begins transferring about 900 MCC employees on to its payroll

## GOAL

**Smooth transition with no operational impact**

- Transaction effective 1 October 2017
- Previous contract employees fully integrated into Tharisa health, safety and operational culture
- Operational improvements – control of reef grades = delivery of improved quality ore to plants = higher recoveries



## THE NOISE

**New mining charter unsettles investors, wipes R50 billion from the sector: report**

**ANALYSIS: Zwane's mining charter lunacy**

The arbitrary and prescriptive new mining charter is unlikely to pass legal muster, so minister Mosebenzi Zwane may be re-open negotiations with the mir

Zwane blunder: mining bleeds

**ANC slaps Zwane down on Mining Charter**

**Chamber lodges urgent interdict against Zwane's mining rights law**

DMR will not implement licence moratorium, according to tweet

Gigaba sets December deadline for MPRDA, re-opens Charter talks

**MPRDA heading for same legal wrangling as Mining Charter**

## THARISA FACTS

Tharisa's Black Economic Empowerment (BEE) partners, Tharisa Resources and the local community, own 20% and 6% respectively at the mine level. It would be relatively simple to upscale ownership levels if required.

Certain of new targets set out in Mining Charter III apply only to new mining rights and not existing mining rights. Tharisa holds an existing mining right and therefore not required to transfer 1% of its annual turnover to a trust created and managed by the government.

Tharisa has always been committed to transformation. It already has a share-based incentive plan in place for employees and its community initiatives have launched a number of small enterprises supporting members of the mining community.

## SUPPLYING TISCO JV

- Five-year strategic co-operation agreement
- Minimum of 240 ktpa at market prices
- Represents ~ 25% of Tharisa's forecast FY2017 production of 1 Mt of metallurgical grade chrome concentrate
- Start September 2017
- JV has installed 700 ktpa Outokumpu FeCr sintering and pelletising capacity, with an annual producing volume of 300 kt FeCr
- JV considering a phase 2 expansion, which would increase its FeCr production to 450 ktpa and increase requirements for metallurgical chrome concentrate

## THIRD-PARTY CHROME

- Arxo Metals agreement with Western Platinum
- Operate the K3 UG2 plant, as well as the marketing and sale of the UG2 chrome concentrate produced
- Effective as of 29 August 2017
- Arxo Metals will unlock greater value using innovative technology already in use at Tharisa's operations
- Agreement in line with strategic objective of initiating third-party trading
- Adds about 200 kt to chrome sales annually

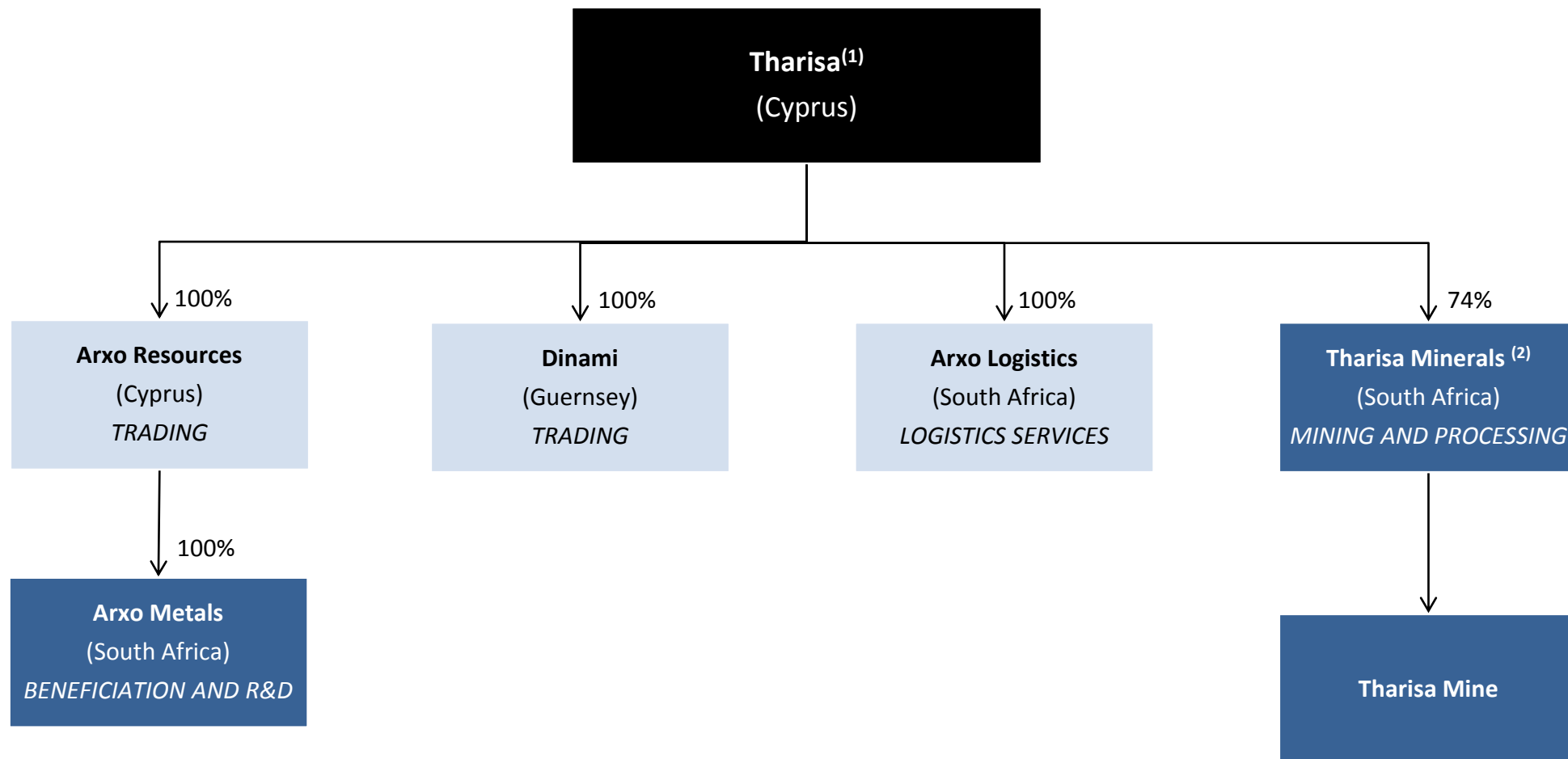
## PGM R&D

- Arxo Metals commissioning a 1MW DC furnace to produce PGM-rich metal alloys on a pilot scale
- Furthers Tharisa's beneficiation capability and profitability of its PGM segment
- Furnace to be commissioned end of September 2017
- PGM-rich metal alloy will be smelted by Lonmin as part of a PGM research and development co-operation agreement entered into on 19 July 2017



# ANNEXURES





(1) Primary listing on the JSE with secondary listing on the LSE

(2) The 26% is held by Thari Resources at 20% and a Community Trust at 6%

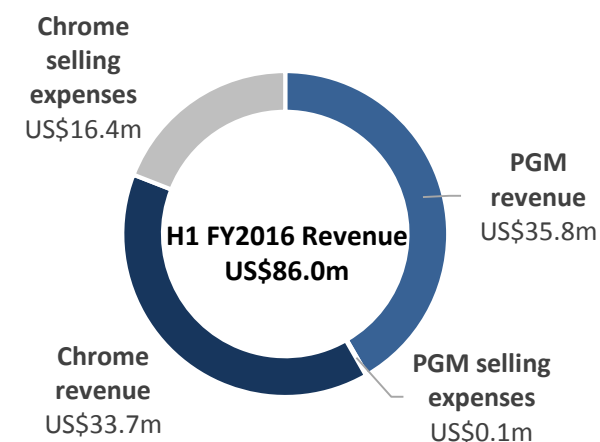
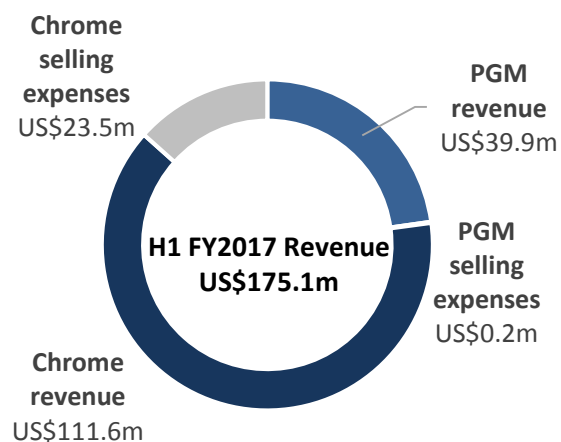
# SUMMARY OF RESULTS

## INCOME STATEMENT HIGHLIGHTS

US\$ millions	H1 FY2017	H1 FY2016	Change
Revenue	175.1	86.0	103.6%
Gross profit	82.4	21.1	290.5%
Gross profit margin	47.0%	24.6%	91.1%
Results from operating activities	69.9	10.6	559.4%
EBITDA	81.0	14.7	451.0%
EBITDA margin	46.3%	17.1%	170.6%
Net finance costs	1.6	6.1	(74.1%)
Profit before tax	68.3	4.5	1 417.8%
Tax	17.3	1.4	1 163.0%
Profit after tax	51.0	3.1	1 545.2%
Headline earnings per share (US\$ cents)	16	1	1 500.0%

## SEGMENTAL ANALYSIS

US\$ millions	PGMs		CHROME	
	H1 FY2017	H1 FY2016	H1 FY2017	H1 FY2016
Gross profit	19.0	12.1	63.4	9.0
Gross profit margin	44.5%	33.8%	47.8%	17.9%
Shared cost allocation	25%	50%	75%	50%
Sales volume	69.3 koz	59.1 koz	502.4 kt	481.7 kt
Average transport costs per tonne of chrome concentrate (CIF main ports China)			US\$50/t	US\$40/t





## CURRENT

US\$ millions	H1 FY2017	FY2016
<b>Total interest bearing debt</b>	<b>38.4</b>	67.1
Long term	<b>10.5</b>	24.0
Short term*	<b>27.9</b>	43.1
<b>Debt service reserve account</b>	<b>4.8</b>	9.8
<b>Pro forma interest bearing debt</b>	<b>33.6</b>	57.3
<b>Pro forma debt to total equity ratio</b>	<b>13.0%</b>	28.4%
<b>Cash and cash equivalents</b>	<b>26.6</b>	15.8
<b>Net debt</b>	<b>7.0</b>	41.4
<b>Net debt to total equity ratio</b>	<b>2.7%</b>	20.5%
<b>Net current assets</b>	<b>58.4</b>	0.5
<b>Return on equity</b>	<b>14.7%</b>	5.8%

## OWNER MINING TRANSITION

	US\$ millions
<b>Fleet purchase</b>	22.3
<b>Lease equipment (approximate capital portion)**</b>	6.3
	28.6
<b>Less: provisions and offsets</b>	1.8
	26.8
<b>Pro forma debt to total equity if fully debt funded</b>	23.3%

\*\* Assuming leases on balance sheet

\* Includes certain amounts in accounts payable relating mainly to accrued dividends payable by a subsidiary

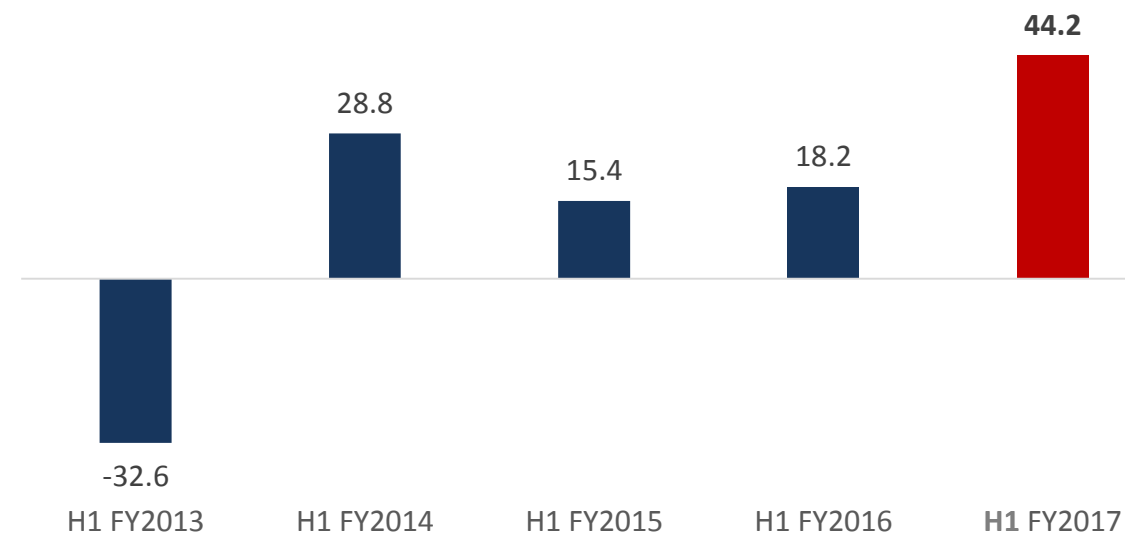
# STRONG CASH FLOW GENERATION

## SUMMARISED CASH FLOW STATEMENT

US\$ millions	H1 FY2017	H1 FY2016
Cash flow from operating activities	44.2	18.2
Investing cash flows	(8.8)	(6.6)
Financing cash flows	(24.9)	(23.6)
Net increase/(decrease) in cash	10.5	(12.0)
Cash at the end of the period	26.6	11.1
Free cash flow per share (US\$ cents)	14	5
Price/free cash flow per share	11.8	9.9
Depreciation	8.4	4.6

## OPERATIONALLY CASH GENERATIVE

US\$ millions



# PGM PRODUCTS AND END USES

## PGM MARKETS

- Largest deposits of PGMs are found in South Africa, Zimbabwe, Russia
- Bushveld Complex is the largest platinum resource in the world and accounts for 75% of annual global production
- Platinum market reports issued independently by Johnson Matthey and the World Platinum Investment Council suggest mining supplies of the precious metal will decrease during 2017
- While platinum prices remain constrained, the prices of some of the other metals that make up the PGM basket are enjoying improved price levels

## PRIMARY USES OF PGMs

<b>Pt</b>	Platinum	Automotive catalytic converter	Jewellery
<b>Pd</b>	Palladium	Automotive catalytic converter	Jewellery
<b>Ru</b>	Ruthenium	Electrical contacts	Chemical catalyst
<b>Rh</b>	Rhodium	Automotive catalytic converter	Optic fibre coatings
<b>Ir</b>	Iridium	Corrosion resistant	Automotive spark plugs
<b>Au</b>	Gold	Jewellery	Coinage

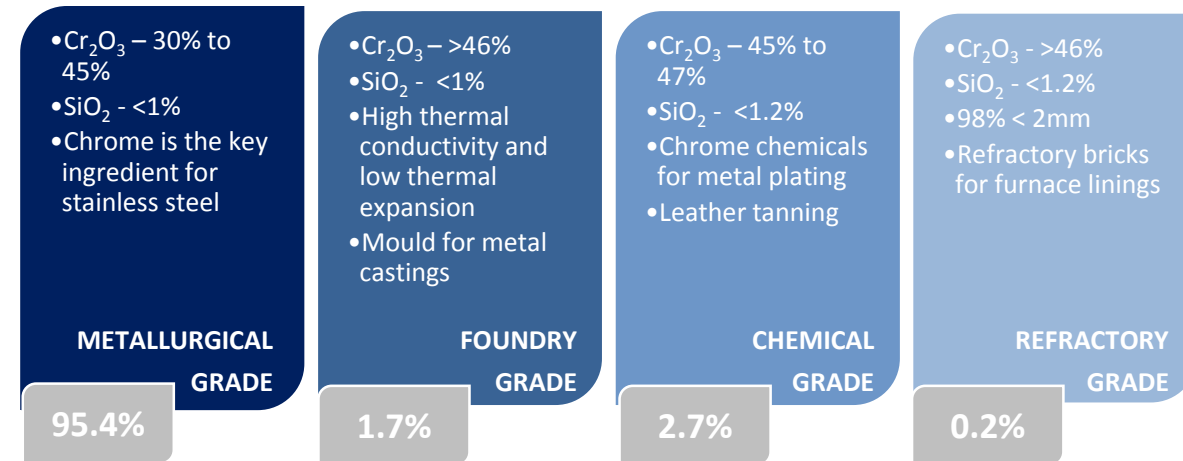


# CHROME PRODUCTS AND END USES

## CHROME MARKETS

- Chromite is the mineral extracted from the ore
- Chrome ore is mined from primary chromite deposits
- Chrome concentrates are recovered from tailings and secondary ores
- 95.4% of global chromite produced is metallurgical grade used for stainless steel production (mostly via ferrochrome)
- Globally, 6.3% of global chromite produced is the higher value chemical and foundry products
- Tharisa produces up to 23.4% of the higher value chemical and foundry grades, depending on the ore mix

## USES OF CHROME ORE/CONCENTRATE



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