

# TNG LIMITED

ASX:TNG

Company Update  
Resource Rising Stars Conference  
Paul Burton, Managing Director



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## COMPETENT PERSON'S STATEMENTS

- ▶ The information in this report that relates to the Mount Peake Mineral Resource estimates is extracted from an ASX Announcement dated 26 March 2013, (see ASX Announcement – 26 March 2013, “Additional Information on the Mount Peake Resource”, [www.tngltd.com.au](http://www.tngltd.com.au) and [www.asx.com.au](http://www.asx.com.au) ), and was completed in accordance with the guidelines of the JORC Code (2012). Initial mining and financial assessment work, based on the Mineral Resource, followed (see ASX Announcement – 15 July 2013, “TNG Considers Two-Stage Development Option for Mount Peake Project, NT”, [www.tngltd.com.au](http://www.tngltd.com.au) and [www.asx.com.au](http://www.asx.com.au)). The Company 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 Mineral Resource estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original market announcement.
- ▶ The information in this report that relates to the Mount Peake Ore Reserve estimates is extracted from an ASX Announcement dated 31 July 2015, (see ASX Announcement – 31 July 2015, “Mount Peake Feasibility Study Confirms a World-Class Project”, [www.tngltd.com.au](http://www.tngltd.com.au) and [www.asc.com.au](http://www.asc.com.au)) and was completed in accordance with the guidelines of the JORC Code (2012). The Company 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 Ore Reserve estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original market announcement.
- ▶ The information in this report that relates to Exploration Results for Mount Peake and Mt Hardy projects are based on information compiled by Exploration Manager Mr Kim Grey B.Sc. and M. Econ. Geol. Mr Grey is also a member of the Australian Institute of Geoscientists and a full time employee of TNG Limited. Mr Grey has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Grey consents to the inclusion in the report of the matters based on his information in the form and context in which it appear.

## PRODUCTION TARGETS AND FINANCIAL INFORMATION

- ▶ Information in relation to the Mount Peake Definitive Feasibility, including production targets and financial information, included in this report is extracted from an ASX Announcement dated 31 July 2015, (see ASX Announcement – 31 July 2015, “Mount Peake Feasibility Study Confirms a World-Class Project”, [www.tngltd.com.au](http://www.tngltd.com.au) and [www.asx.com.au](http://www.asx.com.au)). The Company confirms that all material assumptions underpinning the production target and financial information set out in the announcement released on 31 July 2015 continue to apply and have not materially changed.

## Key Corporate and Financial Data

ASX code:	TNG
Market capitalisation (at 15c):	\$121M
Shares on issue:	804M
Cash (at 15 April 2017):	\$7.3M
Auditors: KPMG Lawyers: Clifford Chance	

## Board of Directors

Paul Burton	Managing Director
Stuart Crow	Non-executive Director
Rex Turkington	Non-executive Director
John Davidson	Non-executive Director

## Major Shareholders

WWB Investments P/L	9.94%
Aosu Investment & Development Co	6.99%
Ao-Zhong International Mineral Resources	3.85%
SMS Investments SA	1.81%

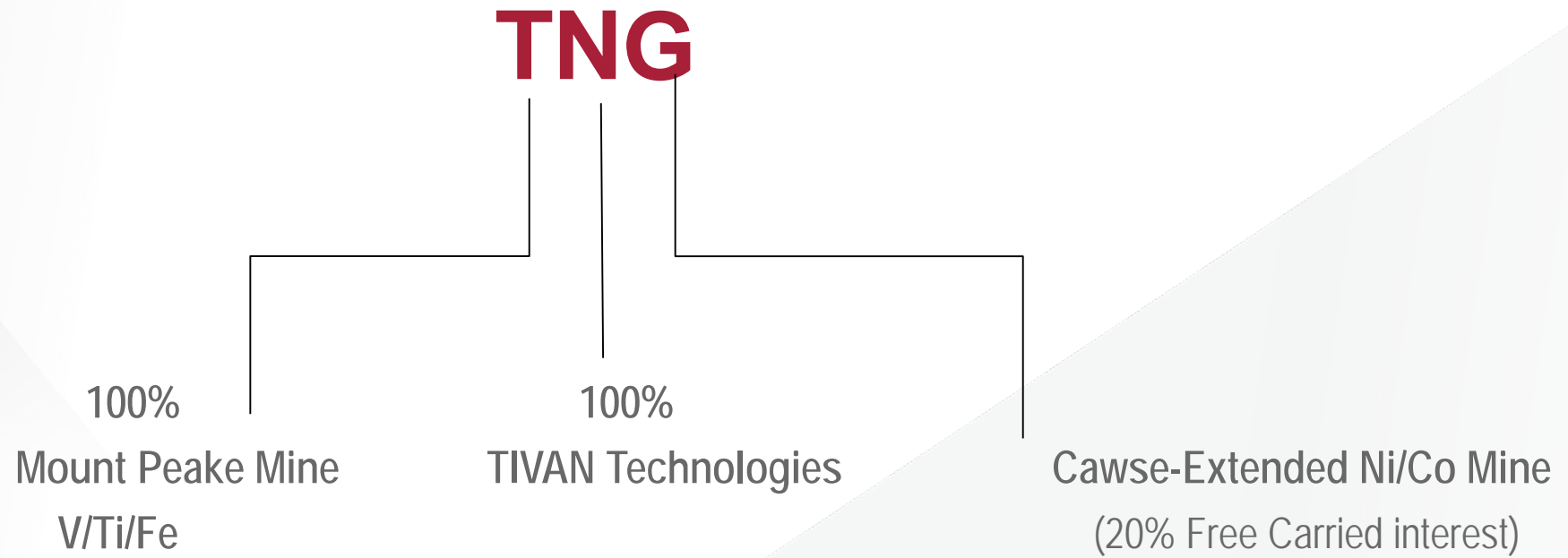
*(Directors and their related companies hold approximately 4% of issued capital)*

### 12-month share price - as at 27 April 2017



## TNG and Mount Peake overview

- ▶ Successful demerger and listing of Todd River Resources (ASX:TRT)
- ▶ Simplified Corporate structure enables focus on Mount Peake and TIVAN
- ▶ Focus has been on de-risking and locking down final designs:
  - Engineering Designs and layouts for mine nearing completion
  - Tivan process flow sheet completed
  - Mine area cleared by TO's for construction
  - LOM water aquifer secured
- ▶ Financing discussions advancing
- ▶ Permitting anticipated
- ▶ Darwin land site for TIVAN processing facility secured



# Recent News: Vanadium Storage Batteries....

## May 9, 2017 – Robert Friedland Gets Behind Vanadium Redox Batteries

- ▶ VRB energy storage technology poised for massive growth in support of renewable energy
- ▶ “We think **there’s a revolution coming in vanadium redox flow batteries**”

## May 26, 2017 – HPX Invests in Pu Neng’s Storage Tech

- ▶ China’s Pu Neng attracts major investment >\$90m from High Power Exploration (HPX)
- ▶ HPX is a privately owned, metals focused exploration company that also **invests in high growth emerging technologies**
- ▶ HPX’s **Board includes Robert Friedland** (CEO and Co-Chairman) and Eric Finlayson (ex head exploration Rio)



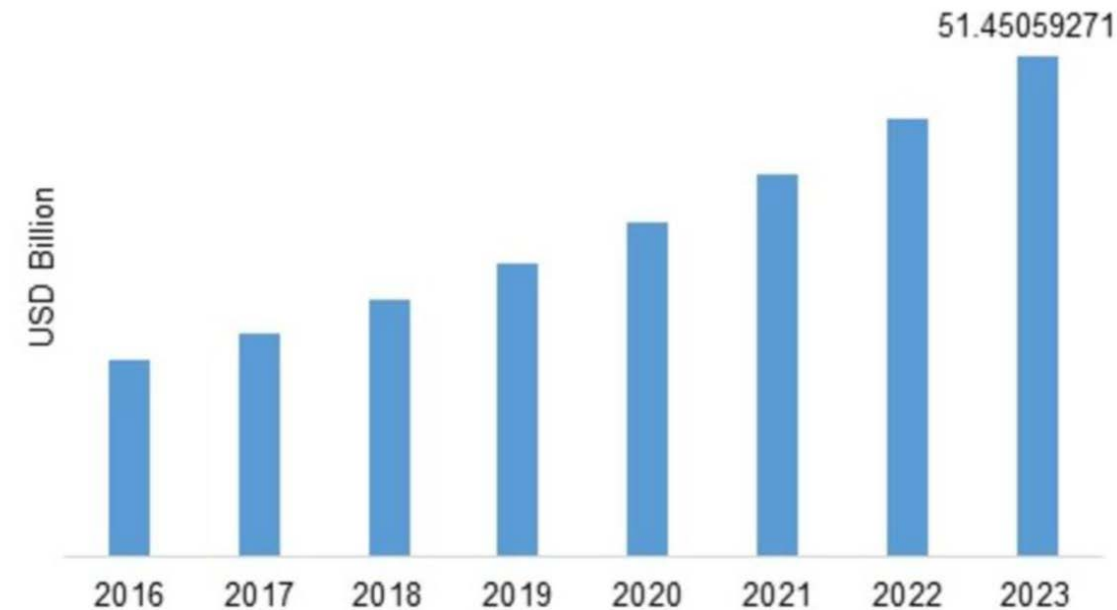
## Recent News: Titanium Pigment.....

### May 12, 2017 – Kronos Profits Surge on Higher TiO<sub>2</sub> Prices, Sales

- ▶ Kronos a titanium dioxide producer reports improved results after the recent selling prices for the pigment rise

### May 10, 2017 – Global Titanium Dioxide Market Expected to Rise at CAGR of +14% during 2023

- ▶ Global Titanium Dioxide expected **growth of USD ~ 44.954 billion** by 2023 with CAGR of ~14.28% between 2016 and 2023
- ▶ Based on **Application** the market is segmented into **paints, coatings, plastics, photo-electrode, pigment, paper, cosmetics, food additives**
- ▶ Based on **End User** the market is segmented into **automotive, personal care, pharmaceutical, food & beverages, construction industry**



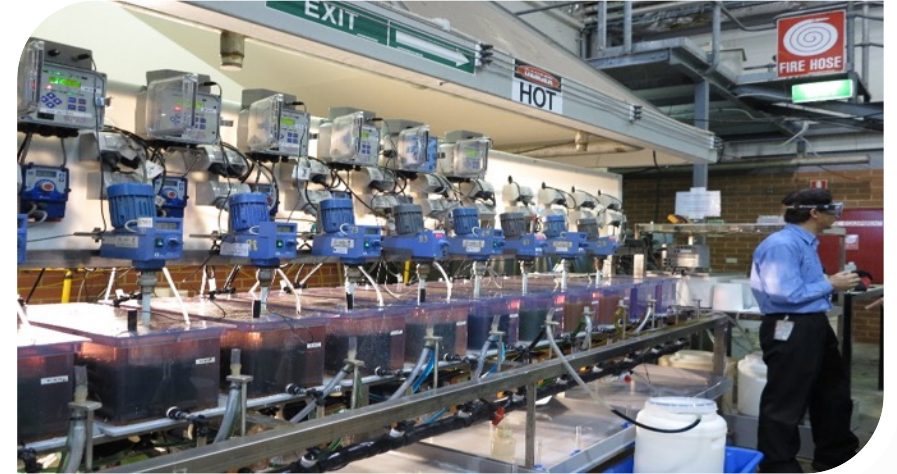
- ▶ Vanadium able to store and retain electric charge
- ▶ Advances in Vanadium Battery Technology
- ▶ Vanadium flow batteries store energy in the electrolyte fluid
- ▶ Life of a commercial lithium-ion battery = 5 to 8yrs
- ▶ Life of a vanadium flow battery is 20+yrs
- ▶ At the end of that life the contents of the vanadium battery can be re-used
- ▶ Vanadium Electrolyte successfully produced by TNG from Mount Peake V205.
- ▶ Opens significant new business potential for TNG





# Titano-magnetite Ores: Key Strategic Advantages

- ▶ **ABUNDANT:** many known, accessible and easy-to-mine deposits
- ▶ **ILMENITE SHORTAGE:** high-grade ilmenites, suitable for synthetic rutile production are becoming scarce
- ▶ **GROWING VANADIUM DEMAND:** urbanization in fast-growing emerging markets calls for the construction of high rises, requiring large quantities of vanadium-reinforced rebar
- ▶ **VANADIUM REDOX BATTERIES:** Unkown potential – but 50 x 20MWh VRB would require 16,000MT of V2O5 equivalent to TNG's forecast annual production.
- ▶ **POTENTIAL FOR ADDITIONAL PRODUCTS:** the hydrometallurgical processing of titano-magnetite also allows the extraction of other valuable fractions, such as scandium, high-purity silicon and MgO



## Processing polymetallic ores

- Use of **abundant and low-cost raw material**: titanomagnetite
- Extraction of **three target metals**: Fe, V and Ti

## Uses well-proven technology

- Based on an **innovative reconfiguration** of proven components
- Individual process steps **successfully demonstrated at industrial scale**

## Small environmental footprint

- **Hydrometallurgical process**
- **No smelters** involved

## Highly economic process

- **Multiple revenue streams** from products with one common processing train
- **Low operating cost**

## Flagship project:

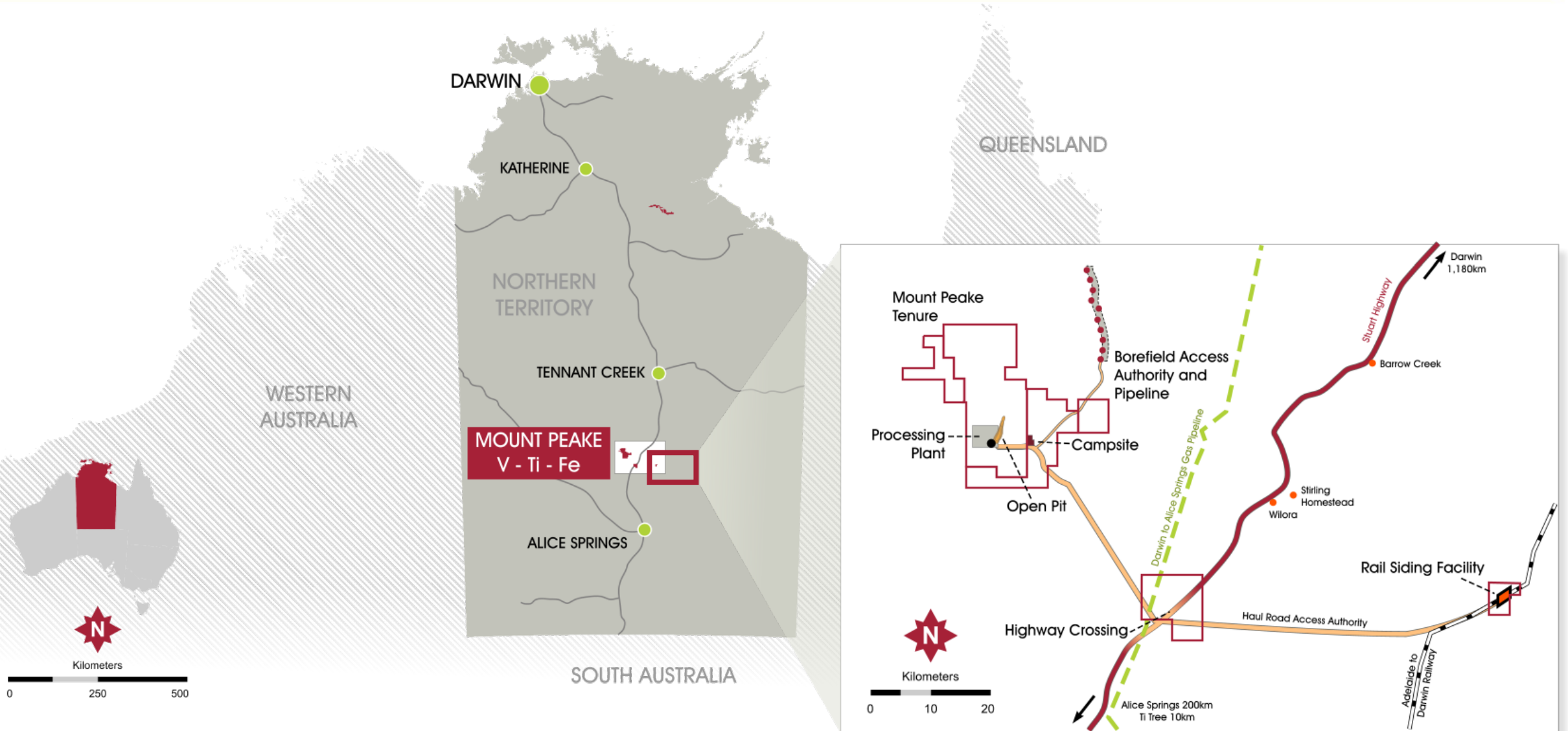
A Vanadium-Iron-Titanium Project, located in northern Australia's development hub

- ▶ **World-scale project** with 17 year mine life: circa A\$27.3b
- ▶ TIVAN™ metals refinery to produce high-purity products annually for export:
  - ▶ 17,560t V<sub>2</sub>O<sub>5</sub>,
  - ▶ 236,000t TiO<sub>2</sub> pigment
  - ▶ 637,000t iron
- ▶ Robust economics: A\$4.9b NPV, 41% IRR

## Agreements in Place:

- ▶ Project Facilitation Agreement (PFA) signed with Northern Territory Government
- ▶ Binding Heads of Agreement with SMS Group for design of TIVAN™ refinery
- ▶ MOU with DOWNER for mine
- ▶ Binding offtake agreements in place
- ▶ Advanced financing discussions and

# Mount Peake: Project Layout



# Mount Peake Feasibility Study: Key Metrics

Project life	17 years
Mining rate	3Mtpa ( <i>Stage 1</i> ) expanding to 6Mtpa ( <i>Stage 2</i> ) after 4 years
Pre-production capital estimate ( <i>including all infrastructure</i> )	A\$970 million ( <i>Stage 2 expected to be covered from revenue</i> )
Total operating costs ( <i>including mining, processing, transport &amp; royalties</i> )	A\$167 per tonne
Total revenue (life-of-mine)	A\$27.3 billion
Operating cash flow (life-of-mine)	A\$13.6 billion
Net cash flow (life-of-mine)	A\$11.6 billion
Payback period	4 years
Net annual operating cash flow	A\$780M
IRR pre-tax	41%
NPV (at 8% discounted)	A\$4.9 billion

*Refer ASX announcement 31 July 2015.*

## 2016

- ▶ Binding agreement with SMS Group for TIVAN™ refinery design and construction finance
- ▶ MOU signed with Downer EDI for development, construction and operation
- ▶ Binding life-of-mine off-take terms agreed with Gunvor for iron products
- ▶ MOU signed with SMS Group for joint future exploitation of the TIVAN downstream refinery technology
- ▶ SMS Group invest in TNG
- ▶ EIS Detailed water bore production wells commenced at Mount Peake Aquifer
- ▶ Technological advances in TIVAN Process deliver cost savings >\$50m p/a at Mount Peake
- ▶ Gresham Partners appointed as a corporate advisors for the Mount Peake Project
- ▶ Produced high-purity vanadium electrolyte using vanadium pentoxide at Mount Peake Project
- ▶ Mount Peake Traditional Owners provided final approvals for the construction of haul road access to the site
- ▶ MOU with Wogen for the sale and marketing of Mount Peake's titanium products
- ▶ MOU signed with Sumitomo Electric Industries and Energy Made Clean for development of a vanadium based renewable energy market in Australia

## 2017

- ▶ Successful demerger of non-core assets into Todd River Resources (ASX:TRT)
- ▶ Project facilitation agreement with NT Government for location of the TIVAN Facility
- ▶ Submission of EIS supplement

## Binding LOM Off-take Agreements

- ▶ **Vanadium Products:**
  - Binding Life-of-Mine (LOM) Off-take Agreement and Technology Transfer Agreement with WOOJIN Metals
  - WOOJIN's proprietary technology currently has the world's highest vanadium recovery rate and is expected to significantly enhance the Project's profitability
- ▶ **Iron Products:**
  - Binding Term Sheet for LOM Off-take Agreement with major global commodity trader Gunvor (Singapore)
- ▶ **Titanium Products:**
  - Off-take to be agreed



## Project Development Agreements

- ▶ **European-based global engineering giant**
- ▶ Binding agreement for engineering, design and construction of the TIVAN™ refinery in Darwin
- ▶ MOU for joint commercial exploitation of TIVAN™ technology
- ▶ Assisting TNG to obtain funding for refinery construction through Export Credit Agencies or other structured finance
- ▶ *SMS is one of the most significant writers of new business for Germany's Export Credit Agencies, which provide finance on competitive terms to new projects or industries which could benefit German industry*
  
- ▶ **Global engineering and services provider**
- ▶ Pre-Mine development, operations and investment agreement for total project delivery
- ▶ *Downer is a leading service provider in markets including mining, minerals and metals processing, transport services, technology and communication services, utilities services, engineering, construction and maintenance (EC&M) and rail, employing around 20,000 people worldwide*

**SMS**  **group**

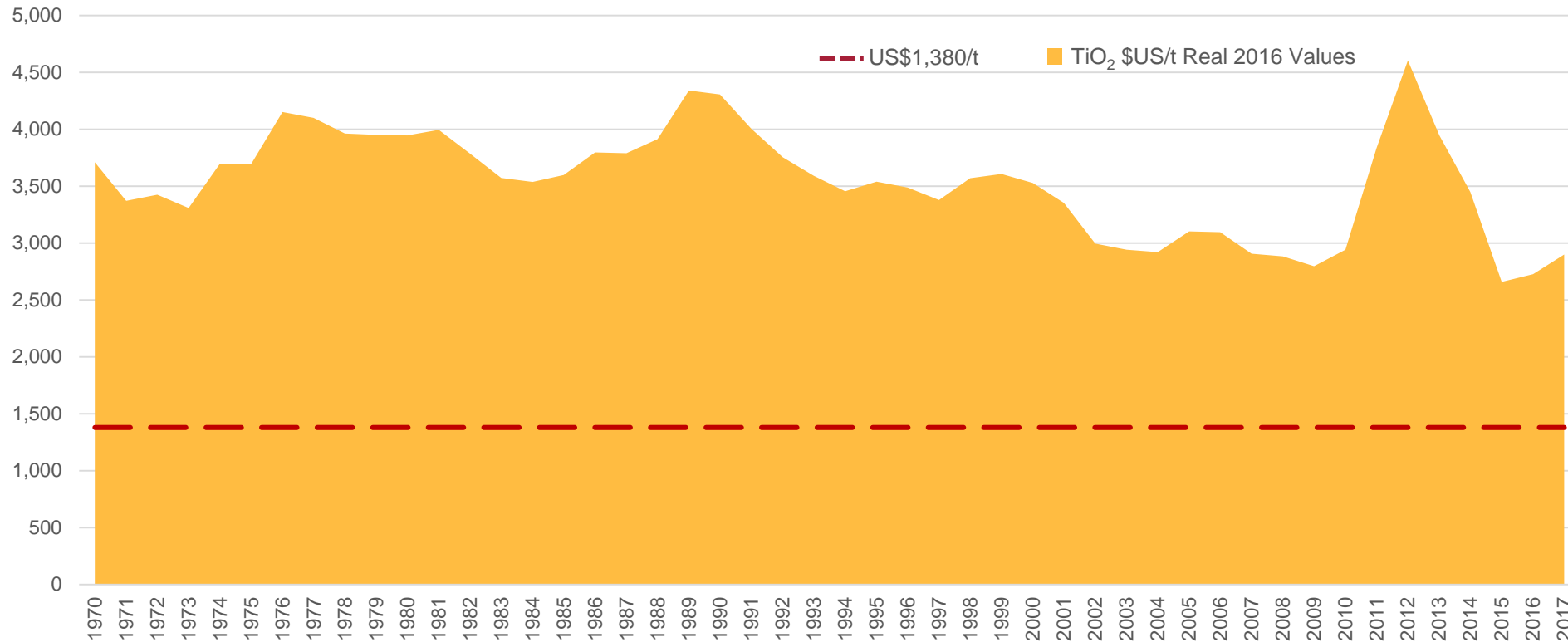
**Downer**   
Relationships creating success



# TIVAN'S Products: Titanium Dioxide

## Titanium dioxide pigment (TiO<sub>2</sub>)

- ▶ World demand: 6,600,000tpa
- ▶ TNG's Phase 1 production: 236,000tpa (3.5% of world demand)
- ▶ Main usage: Paint, plastics, paper and inks
- ▶ TNG's cost of production: Approx US\$1,380/tonne (shaded line below)



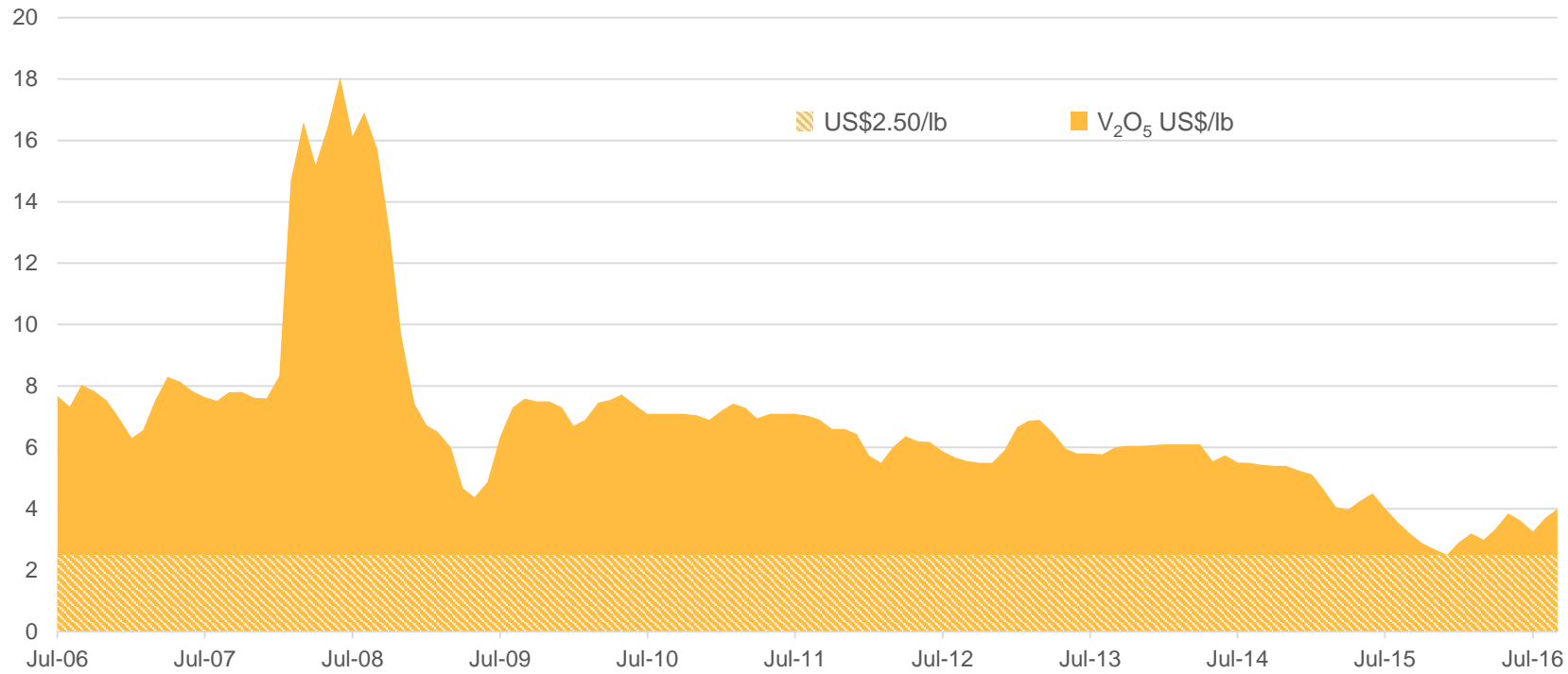
Source: Artikol



# TIVAN'S Products: Vanadium Pentoxide

## Vanadium Pentoxide ( $V_2O_5$ )

- World demand: 140,000tpa
- TNG's Phase 1 production: 17,560tpa (12.5% of world demand)
- Main usage: Steel, non-ferrous alloys, chemicals, catalysts and energy storage (VRB)
- TNG's cost of production: Approx US\$2.50/lb (shaded line below)



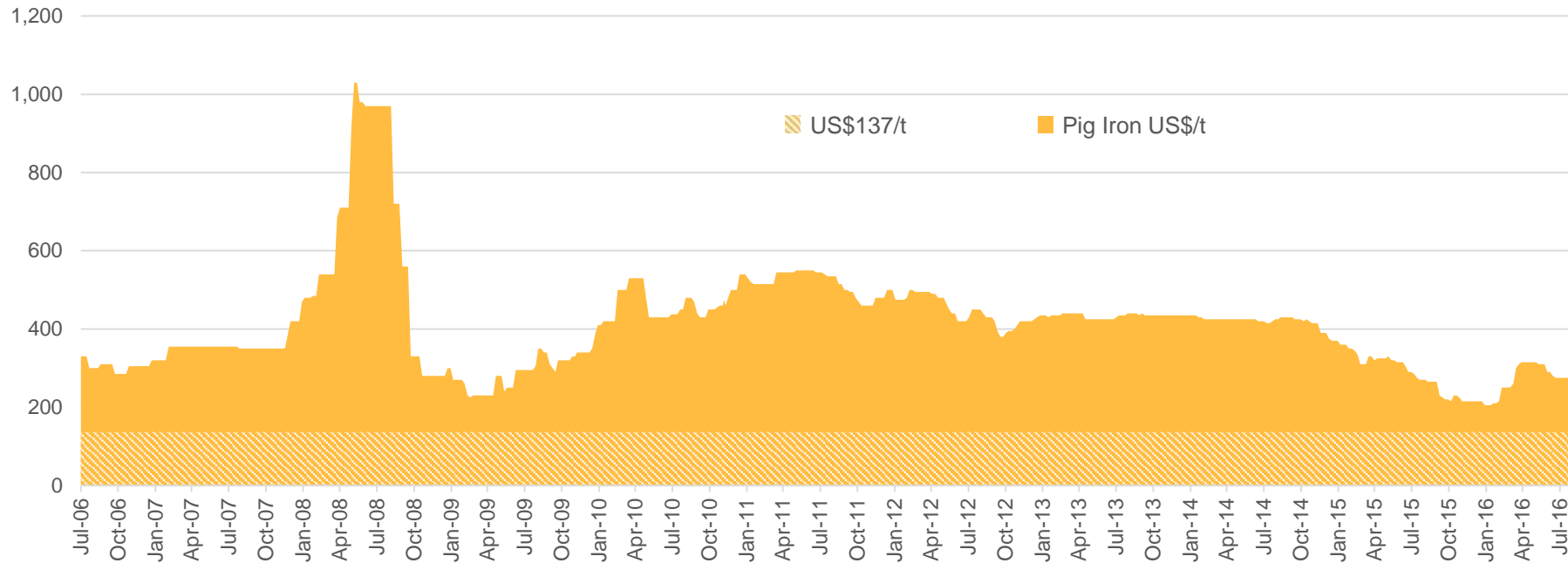
Source: Metal Bulletin



# TIVAN'S Products: Iron

## Pig Iron

- ▶ World demand: 1.2 billion tpa
- ▶ TNG's Phase 1 production: 637,000tpa (0.05% of world demand)
- ▶ Main usage: Steel making
- ▶ TNG's cost of production: Approx US\$137/t (shaded line below)



Source: Metal Bulletin



## A pro-resource development government

- ▶ Darwin – Australia’s northern development hub
- ▶ PFA signed in 2017 for TIVAN Metals Refinery
- ▶ ‘Whole of Government’ development approach
- ▶ Established Project Control Group led by government and TNG
- ▶ Excellent geological and infrastructure support
- ▶ Mount Peake Project adding positive economic and social contribution



## Working together to create opportunities for Aboriginal people

- ▶ A proactive consultative approach with Traditional Owners
- ▶ Creating pathways for training, employment and business opportunities
- ▶ Positive support for Mount Peake project development
- ▶ Clearance obtained for mine and infrastructure





- ▶ Titanium Pigment type/production finalised.
- ▶ Titanium Pigment/marketing cornerstone partner
- ▶ EPC appointed
- ▶ EIS approval
- ▶ ML approval
- ▶ Selection and appointment of Project Management Team
- ▶ Finalise Project Finance
- ▶ Commencement of development of a mine site (subject to EIS, ML, Finance)

- ▶ Developing a Vanadium-Iron-Titanium Project,
- ▶ Located in northern Australia's development hub
- ▶ World-scale project with 17 year mine life
- ▶ Project Facilitation Agreement (PFA) signed with Northern Territory Government
- ▶ Refinery to produce high-purity high-demand products for export
- ▶ Binding Heads of Agreement with SMS Group for design of TIVAN™ refinery development
- ▶ Robust economics : A\$4.9b NPV, 41% IRR
- ▶ Commodity prices increasing
- ▶ Advancing financing discussions
- ▶ Binding offtake agreements in place
- ▶ Growing awareness of Vanadium Redox Batteries – TNG ideally placed to capitalise on this as Australia's first to market v205/electrolyte producer.

# TNG LIMITED

ASX:TNG



**Paul Burton – Managing Director**

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Level 1, 282 Rokeby Road  
Subiaco 6008  
Western Australia  
[www.tngltd.com.au](http://www.tngltd.com.au)

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