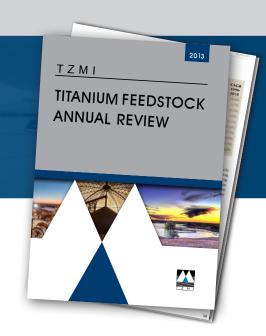


# TITANIUM FEEDSTOCK ANNUAL REVIEW

"Current, relevant and comprehensive review of the titanium feedstock sector provided by independent industry experts"



# WHAT DO YOU RECEIVE?

The Titanium Feedstock Annual Review is a definitive resource to maintain an up to date perspective of the titanium feedstock industry and will provide a comprehensive analysis, data and concise independent commentary with particular focus on the 2012 year.

## TITANIUM FEEDSTOCK ANNUAL REVIEW

A\$5,250 excluding GST. For Australian subscribers, 10% GST will be added to the listed price.

# WHO SHOULD BUY THIS REPORT?

This is an essential resource for titanium feedstocks information and data. This report is suitable for anyone wanting to maintain an up to date perspective of all elements of the industry, including:

- · New titanium feedstock producers
- · Established titanium feedstock producers
- · Pigment producers
- · End-consumers (paint and coatings, paper, plastics, chemicals and others)
- New entrants to the industry
- · Financial industry (fund managers, hedge funds, investors and potential investors)

## **BONUS! Powerpoint Executive Summary**

Receive an additional Executive Summary in electronic format to succinctly convey the key themes and charts.

# WHAT INFORMATION IS INCLUDED?

Titanium Feedstocks Annual Review provides an in depth overview of the industry and identifies key trends and developments in the market by providing authoritative, independent, accurate data and research. This is provided with in depth data presentation, interpretation and analysis along with historical reference. This value driven study will provide you with comprehensive analysis and commentary on the following areas of the sector:

- · An introduction to the sector
- · Titanium feedstocks details
- · Historical information
- · Demand and pricing
- Supply
- · Trends and outlooks
- · Co-Products
- · New projects
- Strategic issues
- · Profiles on all sector participants



# **TABLE OF CONTENTS**

#### **EXECUTIVE SUMMARY**

## 1.0 INTRODUCTION TO TITANIUM FEEDSTOCK

- 1.1 The titanium industry
- 1.2 Titanium feedstock producers
- 1.3 Titanium Feedstock Annual Review structure
- 1.4 Confidentiality and disclaimer

#### 2.0 TITANIUM FEEDSTOCK MARKETS

- 2.1 The feedstock sector
- 2.2 Pigment production
- 2.3 Other end-uses

#### 3.0 HISTORICAL INFORMATION

- 3.1 History of mineral sands industry
- 3.2 The early days of feedstock production
- 3.3 The 1970s
- 3.4 The 1980s
- 3.5 The 1990s
- 3.6 The 2000s

#### 4.0 FEEDSTOCK DEMAND AND PRICING

- 4.1 Introduction
- 4.2 Feedstock demand in 2012
- 4.3 Feedstock demand by end-use
- 4.4 Feedstock trade
- 4.5 Feedstock pricing in 2012

## 5.0 FEEDSTOCK SUPPLY

- 5.1 Introduction
- 5.2 Feedstock supply in 2012
- 5.3 Supply developments in 2013 and 2014

## 6.0 FEEDSTOCK TRENDS AND OUTLOOK

- 6.1 Wrap of events in 2012
- 6.2 Supply/demand analysis and industry outlook to 2014
- 6.3 Pricing outlook to 2014

#### 7.0 CO-PRODUCTS: PIG IRON

- 7.1 Introduction to pig iron
- 7.2 Pig iron production via ilmenite smelting
- 7.3 Pig iron and the steel industry
- 7.4 HPPI production
- 7.5 Price trends

#### 8.0 NEW PROJECTS

- 8.1 Approved projects not yet commissioned
- 8.2 Projects with completed technical feasibility
- 8.3 Projects under active investigation with production schedules
- 8.4 Projects under active investigation without production schedules

## 9.0 STRATEGIC ISSUES

- 9.1 Challenges in 2012
- 9.2 Outlook for feedstock industry

#### APPENDIX 1: INTRODUCTION TO THE TIO2 **INDUSTRY**

APPENDIX 2: PRODUCER PROFILES

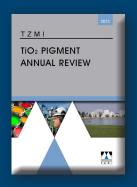
APPENDIX 3: NEW PROJECTS PROFILES

# TZMI'S ANNUAL REVIEW SUITE

TZ Minerals International is pleased to announce the forthcoming release of its suite of four Annual Reviews. TZMI's Annual Reviews encompass four volumes covering Titanium Metal, Titanium Feedstocks, TiO<sub>2</sub> Pigment and Zircon. TZMI's Annual Review suite provides a comprehensive, in depth and independent analysis of each of the sectors in the TiO<sub>2</sub> value chain.











# **Figures**

Titanium feedstock flowsheet

Major titanium feedstock producers

World resources of titanium minerals

The sulfate process

The chloride process

Demand for feedstock by product type: 2010–2012 Incremental pigment supply changes: 2010–2014

Changes in sulfate-grade feedstock demand by product type: 2010-2014 Changes in chloride-grade feedstock demand by product type: 2010–2014

Monthly global titanium feedstock imports: 2010–2012 Sulfate ilmenite prices for cross-border trade in 2012 Chloride ilmenite prices from cross-border trade in 2012

Rutile prices from cross-border trade in 2012

Synthetic rutile prices for cross-border trade in 2012

Chloride slag and UGS prices from cross-border trade in 2012

Sulfate slag and chloride fines prices for cross-border trade in 2012

Changes in feedstock production by product type: 2011–2012

Titanium feedstock supply by product type in 2012 Titanium feedstock production by country in 2012

Chloride versus sulfate feedstock supply: 2010–2012

Titanium feedstock supply: 2010–2014

Supply/demand balances for all titanium feedstocks: 2010–2014 Crude steel, pig iron, HPPI and slag production: 2002-2011

Annual crude steel production: 2008-2012

Crude steel production annual growth trend: 2008-2012 Share of world crude steel production: 2012 and 2011 HPPI production from titanium slag producers: 2008–2012

## **Tables**

Feedstock demand by market: 2010–2014

World titanium feedstock import statistics by country and product: 2008–2012

World gross ilmenite production: 2008–2012

World production of titanium feedstocks: 2008-2012

Global weighted average prices for titanium feedstocks in nominal terms: 2010–2014

Top 10 steel producing countries for 2011 and 2012

Pipeline of new projects

Mineral sands products - rutile, zircon and ilmenite Image courtesy of Iluka Resources



## **ABOUT TZMI**

TZ Minerals International (TZMI) is a global, independent consulting and publishing company with offices in Australia, the US, Africa and China. The strength of TZMI's consulting services stems from extensive practical experience in the mineral sands, titanium dioxide and coatings industries and from a comprehensive database, which has been built up over many years.

TZMI has proven expertise gained from our consultants having many years of direct operating experience in the industry at chief executive, senior operational, analytical and marketing roles. TZMI's publications and data services support the consulting activities and ensure up-to-date, high quality and comprehensive data, analysis and information across the mineral sands, zircon and  ${\rm TiO_2}$  pigment industries.

TZMI provides operational and technical expert advice on many areas including:

- · Mergers and acquisitions
- · Market assessments and industry analysis
- · Due diligence
- Pre-feasibility studies incl. preliminary capital and operating cost estimation
- · Competitive cost analysis and benchmarking
- · Technical reviews and audits
- · Resource assessments
- · Physical separation test work
- · Flowsheet development
- · Customised data analysis and reporting.

#### ORDER FORM

Email completed form to marketing@tzmi.com or fax to +61 8 9359 6050.

	Price excluding GST	Qty	Amount
Titanium Feedstock Annual Review - electronic format (pdf)	A\$ 5,250		A\$
Additional electronic copies (each)	A\$ 1,300		A\$
Titanium Feedstock Annual Review - hard copy (includes postage and handling)	A\$ 5,450		A\$
Additional hard copies (each - includes postage and handling)	A\$ 1,500		A\$
For Australian subscribers: 10% GST will be added to listed price.	Total		A\$

## **PAYMENT OPTIONS**

Credit Card (option available for all subscribers)

Credit Card	Visa	Mastercard	Amex	Din	ners	Total Value \$		
Expiry Date	ate Card No. Security Code							
Cardholders Name			Cardholders Signature					
All Subscribers			Australian Subscribers					
Electronic Funds or Telegraphic Transfers: ANZ Bank International Services, Australia Account Name: TZ Minerals International Pty Ltd BSB: 016 498 Acc No: 2555 45838 Swift: ANZBAU3M Ref No: Purchaser name and invoice number		Cheque: Payable to TZ Minerals International Pty Ltd Mail cheque and Order Form to: TZ Minerals International Pty Ltd PO Box 1252, Victoria Park East WA 6981						
		International Subscribers						
			Bank draft drawn on US Bank by airmail: TZ Minerals International Pty Ltd PO Box 1252 Victoria Park East WA 6981 Australia					
CONTACT DETAILS								
Name								
Position		Compan	у					
Postal Address								
Telephone ( )		Fax ( )			Mobile/Cel	ı ( )		
Email			V	Vebsite				