



Nickel pig iron update

Presentation to INSG

April 2009

Jim Lennon/Max Layton/Bonnie Liu

+44 203 037 4271

jim.lennon@macquarie.com

bonnie.liu@macquarie.com

max.layton@macquarie.com

In preparing this research, we did not take into account the investment objectives, financial situation and particular needs of the reader. Before making an investment decision on the basis of this research, the reader needs to consider, with or without the assistance of an adviser, whether the advice is appropriate in light of their particular investment needs, objectives and financial circumstances. Please see disclaimer.



Main themes for nickel pig iron

- Nickel price fall to \$4-5/lb has made it very difficult for the Chinese nickel pig iron industry
- Nickel market expected to be in surplus for foreseeable future, with Macquarie forecasting 36,000t surplus in 2009 and 33,000t surplus in 2010 and \$4.50/lb and \$5.00/lb nickel in each year respectively.
- \$6-7/lb nickel will see capacity turn back on – from 30-40,000tkpta output could easily get back to 150,000-200,000tpa within 6-9 months.
- Takeaway for producers is not to get complacent that nickel pig iron is gone forever

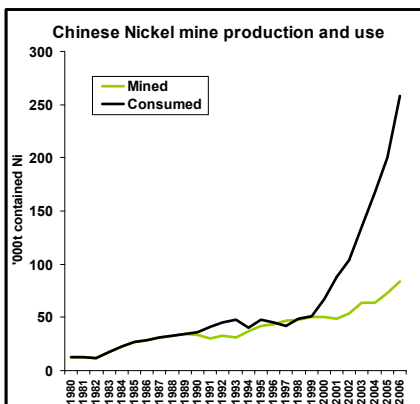


Background: the emergence of NPI

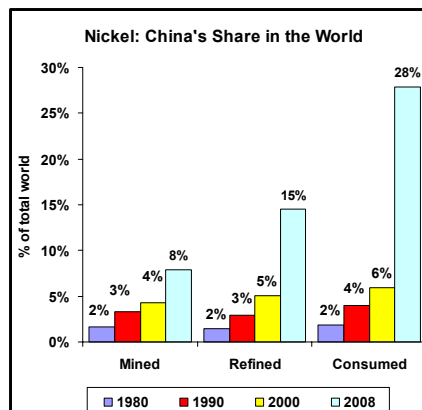
- China's nickel shortage / high nickel prices
- Shortage of stainless steel scrap and ferronickel in China made iron units in NPI valuable to stainless steel makers
- Ability to bring on NPI reflected:
 - Availability of low-cost (low-grade) nickel ores in Philippines, Indonesia and New Caledonia (for a while)
 - Availability of excess blast furnace and electric arc furnace capacity in China (low or no capital costs)



China's major domestic nickel shortage

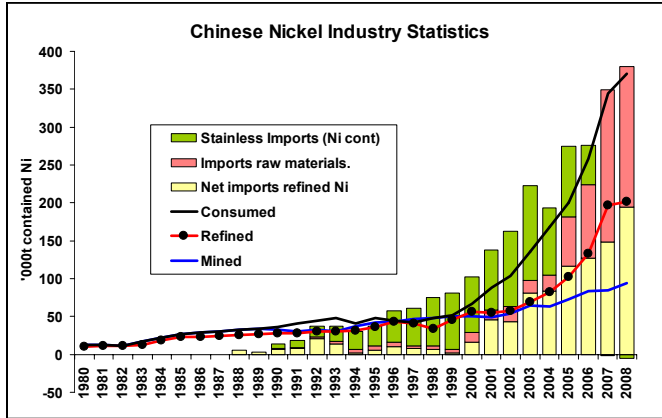


Source: Macquarie Research, April 2009





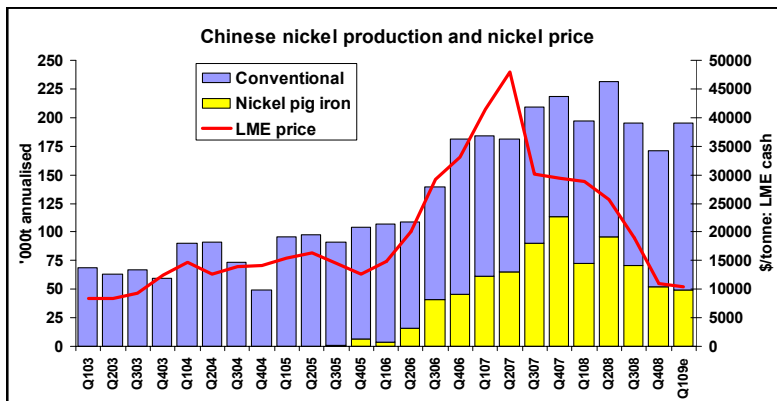
Meeting the shortage – large imports of refined nickel and nickel raw materials



Source: Macquarie Research, April 2009



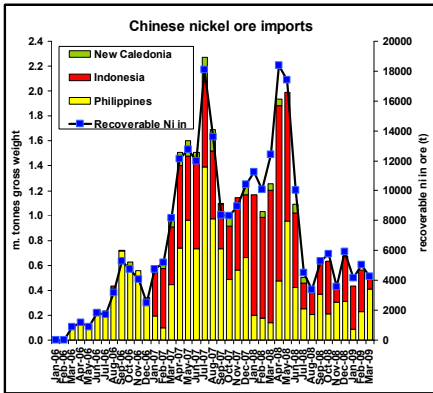
NPI drove Chinese unit nickel output growth in 2006/07, switch to conventional nickel thereafter



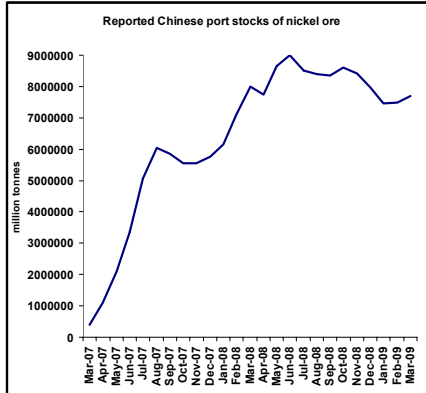
Source: Macquarie Research, April 2009



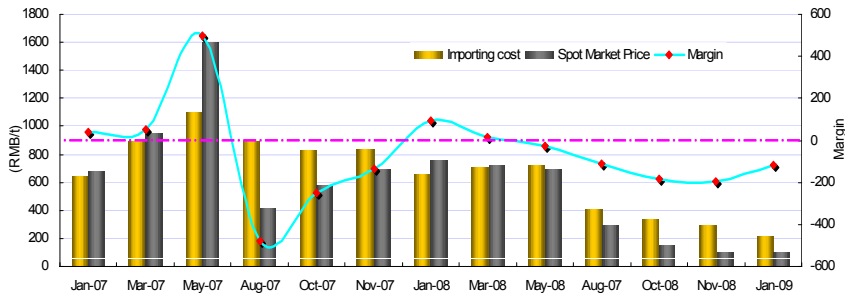
Low-grade ore imports take off – nickel pig iron helped plug the gap...when there was one



Source: CRU, Trade statistics, Macquarie Research, April 2009



Chinese 1.6% grade nickel ore import arbitrage



Source: Tsingshan stainless steel.

Import Cost & Market Price of Nickel Ore: Ni = 1.6%, moisture = 30
 Import cost at unloading port = FOB + sea freight + VAT + port charges;

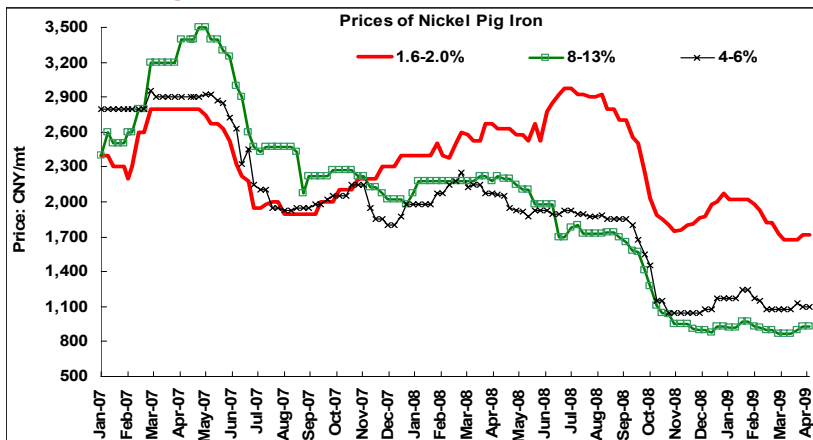


The Chinese NPI industry is enduring a tough 2008/09

- ➔ Over past last 6 months production has fallen sharply:
 - ➔ Lower nickel (and thus NPI) prices
 - ➔ NPI has lost competitiveness to imported nickel in ferronickel and stainless steel scrap
 - ➔ Lower ferrous scrap prices and ferrochrome prices (Cr in NPI is less valuable)



Nickel pig iron prices down 40-50%

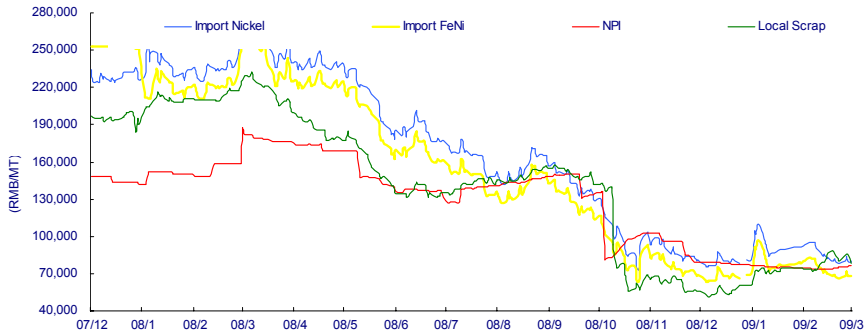


Source: CBI, Macquarie Research, April 2009



NPI has lost cost competitiveness to imported ferronickel and stainless steel scrap

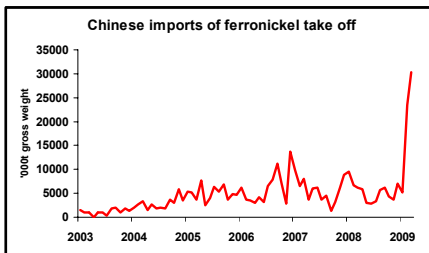
Nickel pig iron cost comparison



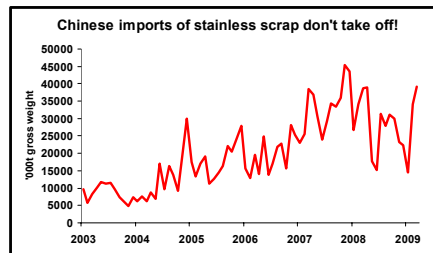
Source: Tsinghan stainless steel.



Chinese imports of ferronickel take off while stainless scrap supplies remain restricted



Source: China Customs, Macquarie Research, April 2009



Source: China Customs, Macquarie Research, April 2009

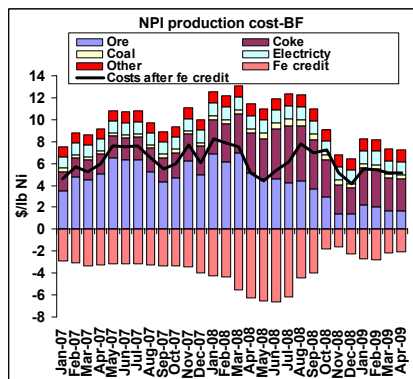
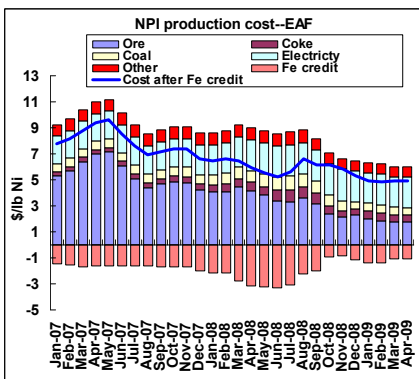


Current structure of Chinese NPI industry

- ➔ Total no. of nickel pig iron producers down to around 30, from over 100 as at end 2007.
 - ➔ <5 NPI producers in China are making <2.0% Ni content products (Shandong) – 40% of total current output and mainly blast furnace route
 - ➔ ~15 producers using small scale *blast furnaces* to make 4-6% grade NPI (Shandong, Jiangsu, Zhejiang & Henan) – 30% of total current output
 - ➔ 10-12 producers using *electric arc furnaces* to make >10% grade NPI (Shandong, Ningxia, Sichuan & Anhui provinces) – 30% of total current output
- ➔ Recent rally in nickel prices to above \$5/lb prompted some restart of electric arc furnaces for NPI output (Shandong).



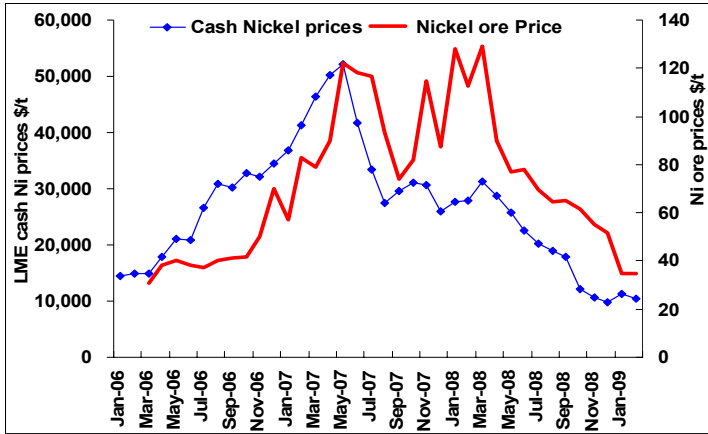
Cost analysis for NPI: >50% reduction in costs not enough



Source: LME, Macquarie Research, April 2009



Nickel ore price driven by nickel price

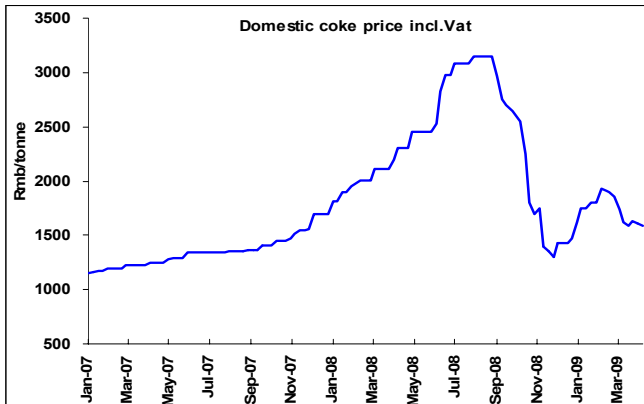


Source: Antaike, China Customs, Macquarie Research, April 2009

CIF price of Philippines Nickel ore: Ni = 1.6-1.8%, moisture = 30%



4Q08 collapse in coke prices helped reduce Blast furnace NPI production costs



Source: CBI, Macquarie Research, April 2009

Market Price of Coke in Shandong Province: Ash < 12.5%, S < 0.8%



NPI expansion projects – creating a ceiling

- There is at least 185ktpa of NPI and FeNi projects planned, proposed or under constructed in China at the moment. 175ktpa of the capacity is new EAF plants.
- Most of the new NPI expansion projects under construction are integrated manufacturers with downstream stainless steel production lines and upstream nickel ore mining investment in Indonesia and/or the Philippines
- Lower nickel prices prevented production ramp up at new finished projects including
 - Jilin Jinsheng 4,000tpa nickel content projects using electric arc furnace
 - 20,000tpa nickel content projects belongs to Shandong Xinhai using electric arc furnace
 - Also deferred the construction of new NPI projects including 15,000tpa nickel content projects planned by Sino steel and Baosteel in Tianjing, Hebei provinces
- However, 15,000tpa FeNi projects constructed by Tsingshan Stainless steel will be completed by October 2009 with nickel content above 10% using electric arc furnace
- Production cost for integrated producers are expected to be around \$4.0-5.0/lb, though prices well above \$5/lb are expected to be necessary to see these projects brought online.
- Long term nickel prices will be supported at the break even point for NPI production from China



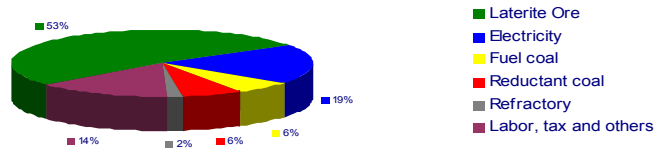
Major NPI Projects in China

Investor	Location	Nickel Capacity (tpa)	Process	Project Situation
Sinosteel & Baosteel	Hebei	15,000	2*33000 kva	Postponed to 2010
Fujian Desheng	Fu Jian	50,000	2*450 M ³ , 4*25000 kva	
Qinzhou Heng Xin	Guangxi	10,000	4*12500kva	
Tsingshan	Henan	10,000	2*380m ³	Production
Tsingshan	Fu Jian	15,000	2*33000 kva	Production Oct-09
Qing Hai Aokai	Qing Hai	50,000	4*12500 kva, 6*25000 kva	
Shandong Xinhai	Linyi	20,000	8*125kva	Production
Tianjin Jinsheng	Jilin	20,000	4*25000kva	Construction finished, production postponed
Zhanhua Qingxiang	Shandong	20,000	2*380m ³ 450m ³ *1	Construction finished, production postponed

Source: Tsingshan stainless steel.



Cost Structure – New Project EF



Source: Tsinghan stainless steel.

Cost structure of NPI New Projects in China

Compared to blast furnaces and existing electric furnaces, electric furnaces of newly established projects are cost saving and environmental-friendly, with

- rotary kiln – lower electricity consumption;
- well designed and large capacity - higher production & nickel recovery, lower maintenance;
- close to sea ports – no inland transportation cost;

Except for sea freight as additional cost, newly built electric furnaces in China are claimed to have no disadvantages compared to FeNi production overseas.



Summary / overview

- ➔ Given high costs of production, the nickel price fall to \$5/lb makes it difficult to bring on new nickel pig iron supply
- ➔ The nickel market is expected to be in surplus for foreseeable future.
- ➔ \$6-7/lb nickel will see capacity turned back on – from 30-40,000tkpta output could easily get back to 150,000-200,000tpa within 6-9 months.
- ➔ Takeaway for producers is not to get complacent that nickel pig iron is gone forever



Important disclosures:

Recommendation definitions

Macquarie - Australia/New Zealand

Outperform – return > 5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return > 5% below benchmark return

Macquarie – Asia/Europe

Outperform – expected return > +10%
Neutral – expected return from -10% to +10%
Underperform – expected < -10%

Macquarie First South – South Africa

Outperform – return > 10% in excess of benchmark return
Neutral – return within 10% of benchmark return
Underperform – return > 10% below benchmark return

Macquarie - Canada

Outperform – return > 5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return > 5% below benchmark return

Macquarie - USA

Outperform – return > 5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return > 5% below benchmark return

Recommendation – 12 months

Note: Quant recommendations may differ from Fundamental Analyst recommendations

Volatility index definition*

This is calculated from the volatility of historic price movements.

Very high-highest risk – Stock should be expected to move up or down 60-100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40-60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30-40% in a year.

Low-medium – stock should be expected to move up or down at least 25-30% in a year.

Low – stock should be expected to move up or down at least 15-25% in a year.

* Applicable to Australian/NZ stocks only

Financial definitions

All "Adjusted" data items have had the following adjustments made:

Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit /efpowa*

ROA = adjusted ebit / average total assets

ROA Banks/Insurance = adjusted net profit / average total assets

ROE = adjusted net profit / average shareholders funds

Gross cashflow = adjusted net profit + depreciation

*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation definitions – For quarter ending 31 April 2009

	AU/NZ	Asia	RSA	USA	CA	EUR
Outperform	40.44%	49.55%	44.83%	38.49%	67.19%	43.84%
Neutral	38.60%	15.57%	39.66%	46.43%	28.12%	39.04%
Underperform	20.96%	34.88%	15.52%	15.08%	4.69%	17.12%



Analyst Certification: The views expressed in this research accurately reflect the personal views of the analyst(s) about the subject securities or issuers and no part of the compensation of the analyst(s) was, is, or will be directly or indirectly related to the inclusion of specific recommendations or views in this research. The analyst principally responsible for the preparation of this research receives compensation based on overall revenues of Macquarie Group Ltd ABN 94 122 169 279 (AFSL No. 318062)(Macquarie) and its related entities (the Macquarie group) and has taken reasonable care to achieve and maintain independence and objectivity in making any recommendations.

Disclaimers: Macquarie Securities (Australia) Ltd; Macquarie Capital (Europe) Ltd; Macquarie Capital Markets Canada Ltd; Macquarie Capital Markets North America Ltd; Macquarie Capital (USA) Inc; Macquarie Capital Securities Ltd; Macquarie Capital Securities (Singapore) Pte Ltd; Macquarie Securities (NZ) Ltd; and Macquarie First South Securities (Pty) Limited are not authorised deposit-taking institutions for the purposes of the Banking Act 1959 (Commonwealth of Australia), and their obligations do not represent deposits or other liabilities of Macquarie Bank Limited ABN 46 009 583 542 (MBL) or Macquarie Group Limited 94 122 169 279 (MGL). MBL does not guarantee or otherwise provide assurance in respect of the obligations of any of the above mentioned entities. MGL provides a guarantee to the Monetary Authority of Singapore in respect of the obligations and liabilities of Macquarie Capital Securities (Singapore) Pte Ltd for up to SGD 35 million. This research has been prepared for the general use of the wholesale clients of the Macquarie group and must not be copied, either in whole or in part, or distributed to any other person. If you are not the intended recipient you must not use or disclose the information in this research in any way. Nothing in this research shall be construed as a solicitation to buy or sell any security or product, or to engage in or refrain from engaging in any transaction. In preparing this research, we did not take into account the investment objectives, financial situation and particular needs of the reader. Before making an investment decision on the basis of this research, the reader needs to consider, with or without the assistance of an adviser, whether the advice is appropriate in light of their particular investment needs, objectives and financial circumstances. There are risks involved in securities trading. The price of securities can and does fluctuate, and an individual security may even become valueless. International investors are reminded of the additional risks inherent in international investments, such as currency fluctuations and international stock market or economic conditions, which may adversely affect the value of the investment. This research is based on information obtained from sources believed to be reliable but we do not make any representation or warranty that it is accurate, complete or up to date. We accept no obligation to correct or update the information or opinions in it. Opinions expressed are subject to change without notice. No member of the Macquarie group accepts any liability whatsoever for any direct, indirect, consequential or other loss arising from any use of this research and/or further communication in relation to this research.

Other Disclaimers: In Canada, securities research is prepared, approved and distributed by Macquarie Capital Markets Canada Ltd, a participating organisation of the Toronto Stock Exchange, TSX Venture Exchange & Montreal Exchange. Macquarie Capital Markets North America Ltd, which is a registered broker-dealer and member of FINRA, accepts responsibility for the contents of reports issued by Macquarie Capital Markets Canada Ltd in the United States and to US persons and any person wishing to effect transactions in the securities described in the reports issued by Macquarie Capital Markets Canada Ltd should do so with Macquarie Capital Markets North America Ltd. Securities research is issued and distributed by Macquarie Securities (Australia) Ltd (AFSL No. 238947) in Australia, a participating organisation of the Australian Securities Exchange; Macquarie Securities (NZ) Ltd in New Zealand, a licensed sharebroker and New Zealand Exchange Firm; Macquarie Capital (Europe) Ltd in the United Kingdom, which is authorised and regulated by the Financial Services Authority (No. 103905); Macquarie Capital Securities Ltd in Hong Kong, which is licensed and regulated by the Securities and Futures Commission; Macquarie Capital Securities (Japan) Limited in Japan, a member of the Tokyo Stock Exchange, Inc., Osaka Securities Exchange Co. Ltd., and Jasdqa Securities Exchange, Inc. (Financial Instruments Firm, Kanto Financial Bureau(kin-sho) No. 231, a member of Japan securities Dealers Association and Financial Futures Association of Japan); Macquarie First South Securities (Pty) Limited in South Africa, a member of the JSE Limited and in Singapore, Macquarie Capital Securities (Singapore) Pte Ltd (Company Registration Number: 196702912C), a Capital Markets Services licence holder under the Securities and Futures Act to deal in securities and provide custodial services in Singapore. Pursuant to the Financial Advisers (Amendment) Regulations 2005, Macquarie Capital Securities (Singapore) Pte Ltd is exempt from complying with sections 25, 27 and 36 of the Financial Advisers Act. Clients should contact analysts at, and execute transactions through, a Macquarie group entity in their home jurisdiction unless governing law permits otherwise. Macquarie Capital (USA) Inc, which is a registered broker-dealer and member of FINRA, accepts responsibility for the content of each research report prepared by one of its non-US affiliates when the research report is distributed in the United States by Macquarie Capital (USA) Inc. Macquarie Capital (USA) Inc. affiliate research reports and affiliate employees are not subject to the disclosure requirements of FINRA rules. Any persons receiving this report directly from Macquarie Capital (USA) Inc. and wishing to effect a transaction in any security described herein should do so with Macquarie Capital (USA) Inc. The information contained in this document is confidential. If you are not the intended recipient, you must not disclose or use the information in this document in any way. If you received it in error, please tell us immediately by return e-mail and delete the document. We do not guarantee the integrity of any e-mails or attached files and are not responsible for any changes made to them by any other person. Macquarie has established and implemented a conflicts policy at group level which may be revised and updated from time to time (the "Conflicts Policy") pursuant to regulatory requirements (including the FSA Rules) which sets out how we must seek to identify and manage all material conflicts of interest. Disclosures with respect to the issuers, if any, mentioned in this research are available at www.macquarie.com/research/disclosures. © Macquarie Group