International Symposium on Sustainable Ironmaking
UNSW Conference & Residential Centre, AGSM Building, Kensington
Thursday, 29 July 2010

Symposium Co-Chairs:
Scientia Professor Veena Sahajwalla
Centre for Sustainable Materials Research & Technology
(SMaRT@UNSW)
University of New South Wales, Sydney, Australia

Professor Masanori Iwase
Thermochemistry Research Group
Department of Energy Science & Technology, Kyotou University, Kyoto, Japan

Official Opening
8.30 – 9.00
Registration and Arrival Coffee

9.30 – 9.35
Introduction: Scientia Professor Veena Sahajwalla, Director of SMaRT@UNSW

9.35 – 9.45
Official Opening: Her Excellency, Governor General of Commonwealth of Australia, Ms Quentin Bryce, AC

9.45 – 9.55
Professor Les Field, Deputy Vice-Chancellor (Research), UNSW
Sustainability Research at UNSW

Plenary Session
9.55 – 10.00
Plenary Session Chairs: Masanori Iwase, Veena Sahajwalla

10.00 – 10.30
Keynote Address: Oscar Gregory, BlueScope Steel, AUSTRALIA
Sustainable Ironmaking in the 21st Century - An Australian Perspective
Co-authors: John Nowlan, John Mathieson, Paul Zulli

10.30 – 11.00 Break

11.00 – 11.30
Keynote Address: Masanori Iwase, Kyoto University, JAPAN
Factors Affecting the Sustainability of Steel Industry

11.30 – 12.00
Keynote Address: Arun Kumar Jagatramka, Gujarat NRE Coke, INDIA
Sourcing metallurgical coal / coke – key challenge to today's iron & steel making

12.00 – 12.30
Keynote Address: Kichihiro Kurihara, Nippon Steel Corporation, JAPAN
Development of Iron-making Technologies in Japan
Co-author: Takashi Miwa

12.30 – 2.00 Lunch

Professor Richard Henry, Deputy Vice-Chancellor (Academic), UNSW
Welcome to UNSW

Professor Merlin Crossley, Dean of Faculty of Science, UNSW
International Engagement and Research Collaborations

Session 1: Advanced Processing and Characterisation of Raw Materials and Waste Resources
Session 1 Chairs: Oscar Gregory, Manabu Iguchi, Arun Kumar Jagatramka, David French

2.00 – 2.30
Keynote Address: Meng Qingbo, Sinosteel, CHINA
Application in Metallurgical Industries of Semi-Coke Produced from Low Rank Coals in China

2.30 – 3.00
Graham O'Brien, CSIRO Earth Science & Resource Engineering, AUSTRALIA
Quantifying the influence that the composition of the individual coal grains in coke oven feed has on coke quality
Co-authors: Merrick Mahoney, Alan Pickup, Karryn Warren

3.00 – 3.30
Jim Craigen, ACALET, AUSTRALIA
Update on ACA COAL21 Fund; funding, strategic intent, status of projects

3.30 – 4.00
Shoji Taniguchi, Tohoku University JAPAN
Electromagnetic Processing of Materials (EPM) and Its Applications to Environmental Engineering
Co-Authors: Shin-ichi Shimasaki, Jong-Soo Park, Kazuyuki Ueno

4.00 – 4.20 Break

4.20 – 4.50
John Planner, Introspec Consulting, AUSTRALIA
A Sustainable Approach to Manage Dust Emission during Transport of Iron Ore and Coal

4.50 – 5.20
Takehiko Kumagai, Hokkaido University, JAPAN
Effect of mechanical offset agitation on mixing
Co-Authors: Manabu Iguchi, Tatsuya Ohmi, Shingo Sato

5.20 – 5.50
David French, CSIRO Energy Technology, AUSTRALIA
Factors that influence the reactivity of the carbonised inertinite- and vitrinite-rich fractions with carbon dioxide
Co-authors: Mihaela Grigore, Richard Sakurovs, Veena Sahajwalla.

5.50 – 6.00
Panel Discussion
Chairs: Mike Bannear, Jim Craigen, Kurihara Kiichiro, Meng Qingbo

7.00 – 10.00
Symposium dinner
## Session 2: Innovative Developments in Ironmaking Technologies

**Session 2 Chairs:** Fumitaka Tsukihashi, Dave Osborne, Garth Peters

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker 1</th>
<th>Title</th>
<th>Speaker 2</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.00 – 9.30</td>
<td>Mike Bannear, OneSteel</td>
<td>Keynote Address: Mike Bannear, OneSteel – Whyalla, AUSTRALIA</td>
<td></td>
<td>Conversion of the OST pellet plant from hematite to magnetite feed and the development of an energy based efficiency program</td>
</tr>
<tr>
<td>9.30 – 10.00</td>
<td>Mansoor Al-Harbi, SABIC T&amp;I</td>
<td>Conversion of the OST pellet plant from hematite to magnetite feed and the development of an energy based efficiency program</td>
<td>Mansour Al-Harbi, Mohammad Essa Samman, SAUDI ARABIA</td>
<td>HADEED - The Saudi Iron &amp; Steel Company - Working towards a sustainable future</td>
</tr>
<tr>
<td>10.00 – 10.30</td>
<td>Masakata Shimizu, Kyushu University</td>
<td>View Points and Possibility for Innovation of Blast Furnace Ironmaking</td>
<td>Mansour Al-Harbi, Mohammad Essa Samman, SAUDI ARABIA</td>
<td>Co-Author: Mansour Al-Harbi, Mohammad Essa Samman</td>
</tr>
<tr>
<td>10.30 – 10.50</td>
<td>Break</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Session 2 Chairs:** Masakata Shimizu, John Mathieson, Christer Ryman

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker 1</th>
<th>Title</th>
<th>Speaker 2</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.50 – 11.20</td>
<td>Garth Peters, Hatch</td>
<td>Garth Peters, Hatch, AUSTRALIA Clean Green Steel Making - Assessing the Technology Options</td>
<td>Leigh Harris, Michiel Freischl, Steve Gale, Hatch</td>
<td>Clean Green Steel Making - Assessing the Technology Options</td>
</tr>
<tr>
<td>11.20 – 11.50</td>
<td>Fumitaka Tsukihashi, The University of Tokyo</td>
<td>Measurement of phase diagrams and in-situ observation of melting and solidifying behaviors for the CaO-SiO2-FeOx-Al2O3-MgO system at various oxygen partial pressures</td>
<td>Hiroyuki Matsuura, The University of Tokyo</td>
<td>Measurement of phase diagrams and in-situ observation of melting and solidifying behaviors for the CaO-SiO2-FeOx-Al2O3-MgO system at various oxygen partial pressures</td>
</tr>
<tr>
<td>11.50 – 12.20</td>
<td>Yansong Shen, UNSW</td>
<td>Yansong Shen, UNSW, AUSTRALIA Technologies for Sustainable Blast Furnace Ironmaking</td>
<td>Jun-ichiro Yagi, Aibing Yu, UNSW</td>
<td>Technologies for Sustainable Blast Furnace Ironmaking</td>
</tr>
</tbody>
</table>

**Session 3: Environmental Advances Associated With Iron and Steel Industry**

**Session 3 Chairs:** Syed Niaz Ahsan, Arun Kumar Jagatramka, Meng Qingbo

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker 1</th>
<th>Title</th>
<th>Speaker 2</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.00 – 2.30</td>
<td>John Mathieson, BlueScope Steel Research, AUSTRALIA</td>
<td>John Mathieson, BlueScope Steel Research, AUSTRALIA</td>
<td>Phillip Ridgeway, Sharif Jahanshahi, Michael Somerville, Dongsheng Xie, Alex Deev</td>
<td>Progress of the Australian Steel Industry CO2 Breakthrough Program</td>
</tr>
<tr>
<td>2.30 – 3.00</td>
<td>Takao Harada, Kobe Steel</td>
<td>Takao Harada, Kobe Steel, JAPAN Greener Steelmaking by Direct Reduction Process</td>
<td></td>
<td>Greener Steelmaking by Direct Reduction Process</td>
</tr>
<tr>
<td>3.00 – 3.30</td>
<td>Eiki Kasai, Tohoku University</td>
<td>Eiki Kasai, Tohoku University, JAPAN</td>
<td></td>
<td>Introduction of the Research Projects of ISIJ for the Flexible and Low Carbon Iron Ore Sintering Technology</td>
</tr>
<tr>
<td>3.30 – 3.50</td>
<td>Afternoon Break</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Session 3 Chairs:** Takao Harada, John Mathieson, Eiki Kasai

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker 1</th>
<th>Title</th>
<th>Speaker 2</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.50 – 4.20</td>
<td>Christer Ryman, MEFOS</td>
<td>Christer Ryman, MEFOS, SWEDEN Use of Process Integration methods for evaluation of energy and GHG emission strategies in ironmaking and steelmaking</td>
<td></td>
<td>Use of Process Integration methods for evaluation of energy and GHG emission strategies in ironmaking and steelmaking</td>
</tr>
<tr>
<td>4.20 – 4.50</td>
<td>Dave Osborne, Xstrata Coal Queensland, AUSTRALIA</td>
<td>Dave Osborne, Xstrata Coal Queensland, AUSTRALIA</td>
<td></td>
<td>Value of Coal Beneficiation Development</td>
</tr>
<tr>
<td>4.50 – 5.20</td>
<td>Sushil Gupta, UNSW</td>
<td>Sushil Gupta, UNSW, AUSTRALIA Understanding Coke Behaviour in an Operating Blast Furnace</td>
<td>ZoZhou Ye, Olavi Kerkkonen, Riku Kanniala, Veena Sahajwalla, UNSW</td>
<td>Understanding Coke Behaviour in an Operating Blast Furnace</td>
</tr>
<tr>
<td>5.20 – 5.50</td>
<td>Panel Discussion</td>
<td></td>
<td></td>
<td>Panel Discussion</td>
</tr>
<tr>
<td>5.50 – 6.00</td>
<td>Wrap Up</td>
<td></td>
<td></td>
<td>Wrap Up</td>
</tr>
</tbody>
</table>

**Panel Discussion:**
- **Chairs:** Takao Harada, Eiki Kasai, John Mathieson, Christer Ryman,