Venice (Italy) • 25-27 May 2016

11TH EUROPEAN ELECTRIC STEELMAKING CONFERENCE & EXPO

FINAL PROGRAMME

Organised by

ASSOCIAZIONE ITALIANA DI METALLURGIA

www.aimnet.it/eec2016.htm
## TIME TABLE

### 24 May 2016

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>17.00</td>
<td>Opening of the registration of attendees</td>
</tr>
<tr>
<td>18.00</td>
<td>Opening of the exhibition &amp; welcome aperitif</td>
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### 25 May 2016

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8.00</td>
<td>Registration of attendees</td>
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### Room ARAZZI

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9.00</td>
<td>Opening session</td>
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<tr>
<td>9.20</td>
<td>Opening lectures</td>
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<tr>
<td>10.35</td>
<td>Presentation of AIM’s Prize Environment and Safety</td>
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<tr>
<td>10.50</td>
<td>“Fencing 2.0 - The Fence of the Future” contest winner awarding</td>
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<tr>
<td>11.00</td>
<td>coffee break</td>
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<td>INNOVATION &amp; FUTURE TRENDS I</td>
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<tr>
<td>12.50</td>
<td>lunch</td>
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<tr>
<td>14.20</td>
<td>INNOVATION &amp; FUTURE TRENDS II</td>
</tr>
<tr>
<td>16.20</td>
<td>coffee break</td>
</tr>
<tr>
<td>16.50</td>
<td>SUSTAINABILITY &amp; ENVIRONMENT II</td>
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### Room BARBANTINI

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<tr>
<td>11.30</td>
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<td>14.20</td>
<td>EQUIPMENT I</td>
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<td>16.20</td>
<td>coffee break</td>
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<tr>
<td>16.50</td>
<td>EQUIPMENT II</td>
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### 26 May 2016

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<tr>
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<td>coffee break</td>
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<tr>
<td>11.10</td>
<td>PROCESS CONTROL II</td>
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<tr>
<td>12.50</td>
<td>lunch</td>
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<tr>
<td>14.20</td>
<td>OPERATIONAL RESULTS I</td>
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<tr>
<td>15.40</td>
<td>coffee break</td>
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<tr>
<td>16.10</td>
<td>OPERATIONAL RESULTS II</td>
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<tr>
<td>19.45</td>
<td>social event</td>
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<td>coffee break</td>
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<td>11.10</td>
<td>MODELLING I</td>
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<td>16.10</td>
<td>MODELLING III</td>
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<td>coffee break</td>
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<tr>
<td>11.30</td>
<td>SUSTAINABILITY &amp; ENVIRONMENT III</td>
</tr>
<tr>
<td>12.50</td>
<td>Closing remarks</td>
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<tr>
<td>13.00</td>
<td>End of the Conference</td>
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<td>13.15</td>
<td>WORKSHOP organized by CSM</td>
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Scope
AIM, the Italian Society for Metallurgy, has the honor to host once more the prestigious Electric Steelmaking Conference & Expo, after the successful events of Florence (1986) and Venice (2002). The Conference, together with the exhibition, will be held in Venice at the magnificent Fondazione Cini on 25-27 May 2016. Nowadays, the fraction of the total world steel production coming from electric arc furnaces is up to 35% and we witness a non-stop technical development of the electric arc process and its auxiliary equipment. All these trends require a better cooperation of steelmaking operators in focusing the attention on increase of productivity, decrease of environmental impact and improvement of steel quality. Moreover, the coupling of such technology with new plant based on direct reduction of iron ores make electric furnace an interesting facility not only for a production route based on steel scrap recycling but also for a flexible exploitation of mineral resources. The 11th European Electric Steelmaking Conference & Expo aims at providing a forum for information transfer of the latest techniques and applications in electric furnace steelmaking and at bringing together steel producers, research and academics active in steelmaking industries, energy production and plant supply concerns.

AIM is looking forward to welcoming you in the unique city of Venice!

Background
1st EEC - Aachen (Germany) - 1983
2nd EEC - Florence (Italy) - 1986
3rd EEC - Bournemouth (England) - 1989
4th EEC - Madrid (Spain) - 1992
5th EEC - Paris (France) - 1995
6th EEC - Düsseldorf (Germany) - 1999
7th EEC - Venice (Italy) - 2002
8th EEC - Birmingham (England) - 2005
9th EEC - Krakow (Poland) - 2008
10th EEC - Graz (Austria) - 2012
Conference Chairman
Giuseppe Pasini - President of Feralpi Siderurgica

Scientific & Steering Committee
M. Alfonso - Riva Acciaio, Italy
L. Angelini - AIM Vice-President, Italy
S.J. Bastow - Outokumpu Stainless, United Kingdom
M. Bianchi Ferri - Acciaiumi, Italy
L. Bianco - Ferriere Nord, Italy
E. Ceccaroli - SGL Group, Italy
G. Cozzi - Consultant, Italy
S. Fasolini - Deref, Italy
H-P. Fauland - Böhler Edelstahl, Austria
G. Ferrario - Primetals, Italy
M. Holmes - Tata Steel Speciality, United Kingdom
B. Kleimt - VDEh-Betriebsforschungsinstitut, Germany
H.-J. Krassnig - Inteco, Austria
K. Krüger - Max Aicher, Germany
C. Mapelli - Politecnico di Milano, Italy
M. Martino - M3C, Italy
G. Mignone - SMS Innse, Italy
E. Mocchetti - Graftech, Italy
S. Pari - SMS Innse, Italy
F. Pastorino - 3PIGREC, Italy
H. Pfeifer - RWTH Aachen University, Germany
C. Raggio - Tenova, Italy
J. Schenk - Montanuniversität Leoben, Austria
R. Sellan - Danielli, Italy
D.G. Senk - RWTH Aachen University, Germany
L. Villa - Leali Steel, Italy

Organising Committee
Federica Bassani - AIM, Italy
Guido Capoferri - Consultant, Italy - President of AIM Plastic Deformation Technical Committee
Sabrina De Donato - AIM, Italy
Maurizio Fusato - Feralpi Siderurgica, Italy - President of AIM Safety & Environment Technical Committee
Antonio Gozzi - Duferco, Italy - President of Federacciai
Ottavio Lecis - AIM, Italy
Francesco Magni - 432 Group, Italy - President of AIM Steelmaking Technical Committee
Carlo Mapelli - Politecnico di Milano, Italy
Franco Milani - Consultant, Italy
Gabriele Rampinini - Forgiatura A. Vienna, Italy - President of AIM Forge Technical Committee
Adriano Zambon - Aferpi, Italy
24 May 2016

17.00 Opening of the registration of attendees
18.00 Opening of the exhibition & welcome aperitif

25 May 2016

8.00 Registration of attendees

Opening Session

9.00 Welcome addresses by:
  prof. Carlo Mapelli - AIM President
  sig. Giuseppe Pasini - Conference Chairman

Opening Lectures

9.20 Determining process conditions during EAF refining to enhance end point control
  H. Köchner, T. Kordel, B. Kleimt, R. Pierre - VDEh-Betriebsforschungsinstitut GmbH, Germany
  G. Thomassen, G. Weides - Saaarschwimde GmbH Freiformschmiede, Germany
  S. Barella, C. Mapelli - Politecnico di Milano, Italy
  L. Bianco, A. Viotto - Ferriere Nord spa, Italy

9.45 Environmental impact evaluation for effective resource management in EAF steelmaking
  I. Matino, V. Colla - Scuola Superiore Sant’Anna, Italy
  F. Cirilli - Centro Sviluppo Materiali, Italy
  B. Kleimt - VDEh-Betriebsforschungsinstitut BFI, Germany
  I. Unamuno Irondo - Gerdau I+D, Spain
  S. Tosato - TenarisDalmine, Italy
  S. Baragiola - Riva Acciaio spa, Italy
  J.S. Klung - Deutsche Edelstahlwerke GmbH, Germany
  B. Peña Quintero - Fundación Tecnalia R+I, Spain
  U. De Miranda - O.R.I. Martin / Accieierie e Ferriere di Brescia, Italy

10.10 Disseminating results of RFCS supported research projects on EAF Technology
  B. Kleimt, H. Köchner - VDEh-Betriebsforschungsinstitut GmbH, Germany
  A. Di Donato, M. De Santis - Centro Sviluppo Materiali spa, Italy
  C. Fricke-Begemann - Fraunhofer-Institute for Laser Technique, Germany
  T. Echterhof, K. Gandt - RWTH Aachen, Germany
  E. Sandberg, I. Heintz, J. Björkvall - Swerea MEFOS, Sweden
  J-C. Pierret - Centre de Recherches Metallurgiques ASBL, Belgium

10.35 Presentation of AIM’s Prize Environment and Safety

10.50 “Fencing 2.0 - The Fence of the Future” contest winners awarding conducted by Nuova Defim Orsogril

11.00 coffee break
INNOVATION & FUTURE TRENDS I
Chairperson: Mauro Bianchi Ferri - Acciaiumi, Italy

11.30  Modern Electric Arc Furnace: safer, sustainable and efficient.
The SMS group EAF’s solutions
M. Milocco, M. Volpe, P. Cancian, G. Michelon - SMS Group, Italy
B. Mellinghoff - SMS Group, Germany

11.50  Increased efficiency of the EAF with telescopic roof closure
Ö. Nal, S. Dolapçioğlu - Yolbulan Baştug Metallurgy Industry Co., Osmaniye, Turkey
A. Partyka, S. Miani, R. Gottardi, M. Huck - INTECO Melting and Casting Technologies GmbH, Bruck an der Mur, Austria

12.10  Why OES measurements beats conventional methods in control of EAF
M. Aula, M. Jokinen - Luxmet Oy, Finland
P. Hooli - Sapotech Oy, Finland
T. Fabritius, J. Roininen - University of Oulu, Finland

12.30  What is the contribution of an electrode control system to industry 4.0?
H. Fohringer, T. Griessacher - Stahl- und Walzwerk Marienhütte GmbH, Graz, Austria
B. Dittmer - Primetals Technologies Germany GmbH, Erlangen, Germany
R. Krump, C. Koubek, C. Sedivy - Primetals Technologies Austria GmbH, Linz, Austria

12.50  lunch
25 May 2016

Room BARBANTINI

SUSTAINABILITY & ENVIRONMENT I
Chairperson: Maurizio Fusato - Feralpi Siderurgica, Italy

11.30 The NoWaste strategy of Georgsmarienhütte
D. Algermissen - FEhS-Institute for Building Materials, Germany
T. Rekersdrees, H. Schliephake, T. Zehn - Georgsmarienhütte GmbH, Germany

11.50 Injection of recycled rubber tires in the EAF as foaming slag agent at Celsa Group
A. Fontana, P. O’Kane, Z. Jin - OneSteel, Arrium Limited, Australia
A. Cruz Armentia Alvarez - Celsa Group, Spain
M. Iacuzzi - More srl, Italy

12.10 Spark arrester improvements on the Fume Plant revamps with required capacity increase in recent SMS group projects
M.P. Cudicio, P. Cancian, M. Crosti - SMS Group, Italy

12.30 Electric Arc Furnace slag: a sustainable valorization in civil engineering applications
F. Faleschini, K. Brunelli, M. Dabalà, C. Pellegrino - Università di Padova, Italy

12.50 lunch
INNOVATION & FUTURE TRENDS II
Chairperson: Hans Peter Fauland - Böhler Edelstahl, Austria

14.20  Tenova iMeltshop: the integrated process manager for the continual improvement of the whole melt shops production line
A. Grasselli, R. Girelli, M. Longobardo, M. Pozzer - Tenova spa, Milano, Italy

14.40  A new dimension of designing arc furnace high current systems
D. Riedinger, A. Vogel, D. Kakas - Badische Stahl-Engineering GmbH, Kehl, Germany
A. Farschtschi - Mering, Germany

15.00  SHARC - The cost effective melting machine
A. Metzen - Hellenic Halyvourgia, Greece
T. Germershausen, J. Bader, A. Bergs - SMS Group GmbH, Germany

15.20  Estimation of carbon concentration in the metal bath by means of on-line measurement of the concentration of the off-gas in the EAF
C. Di Cecca, A.F. Ciuffini, S. Barella, D. Mombelli, C. Mapelli, A. Gruttadauria - Politecnico di Milano, Italy

15.40  Improvement of EAF process efficiency through process management and recovery of wasted energy through off gas for EAF Feralpi Sites
P. Frittella, A. Ventura - Centro Sviluppo Materiali spa-Rina Group, Italy
L. Angelini, S. Filippini, G. Foglio - Feralpi Siderurgica spa, Italy
M. Fennert, T. Bause - Elbe Stahlwerke Feralpi GmbH, Germany
R. Granderath - Tenova Metals Deutschland, Germany

16.20  coffee break
EQUIPMENT I
Chairperson: Giorgio Mignone - SMS Innse, Italy

14.20 SYSTEMS Spray-Cooled™ equipment at ACERINOX – the approach to increase safety and to lower maintenance cost
M. Abel - Systems Spray-Cooled; tripleS, Germany
R.R. Guerrero - Acerinox Europe, Spain
S. Ferguson - Systems Spray-Cooled, USA
P. Starke - SMS group, Germany

14.40 Application of EAF wall-mounted combined injectors for high alloy steel production
L. Gemo, A. Partyka, S. Miani - INTECO Melting and Casting Technologies GmbH, Bruck an der Mur, Austria
C. Rahm - INTECO PTI Europe s.r.o. Ždár nad Sázavou, Czech Republic
M. Jamnik - METAL Ravne d.o.o., Ravne na Koroškem, Slovenia

15.00 Developing magnesia carbon bricks for EAF – The effect of the conformation pressure and the carbon content
K. Hill, E. Gueguen - Magnesita Refractories GmbH, R&D, Germany
S.L.C. Silva, M.A.M. Brito - Magnesita Refractories S.A., R&D, Brazil

15.20 Chemical wear of carbon and silicon carbide-based refractory materials by silicomanganese metal
W. Banda, J. Steenkamp - Mintek, South Africa
E. Matinde - University of Witwatersrand, South Africa

15.40 Vision system for slag identification during the tapping
G. Maccani - BM spa, Borgo Chiese, Italy
A. Ferrari, M. Corradi - Soft Technologies, Borgo Chiese, Italy

16.00 Applications of no cement castables in steelmaking
M. Tonidandel - Seven Refractories, Italy
M. Bregantic - Seven Refractories, Slovenia
S. Sanchetti - Stazione Sperimentale del Vetro, Italy

16.20 coffee break
**Sustainability & Environment II**

Chairpersons: Engris Ceccaroli - *SGL GE Carbon, Italy*
Franco Milani - *Consultant, Italy*

16.50 **Investigation of palm kernel shells as a substitute for fossil carbons in a 140 t DC Electric Arc Furnace**
T. Echterhof, T. Demus, H. Pfeifer - RWTH Aachen University, Germany
L. Schlinge, H. Schliephake - Georgsmarienhütte GmbH, Germany

17.10 **GE heat recovery solutions for EAF fluegas**
S. Boscolo - GE SPS, Italy
H. Anderson - GE SPS Sweden
M. Mörtberg, J. Grubbström - GE SPS, Germany
S. Ose - GE SPS, Norway

17.30 **High efficient energy recovery solutions for melt shops**
M. Dorndorf, M. Liese, R. Granderath, C. Schrade - Tenova Metals Deutschland GmbH, Germany

17.50 **The role of chemical composition and microstructure on leaching behaviour of Electric Arc Furnace (EAF) carbon steel slag**
D. Mombelli, C. Mapelli, S. Barella, C. Di Cecca - Politecnico di Milano, Italy
G. Le Saout, E. Garcia-Diaz - C2MA Ecole des Mines d’Alès, France
EQUIPMENT II
Chairperson: Giorgio Mignone - SMS Innse, Italy

16.50 Improved EAF processes: the new SIS and CONSO Burner/Injectors from the SMS Group serving whole range of furnaces
M. Zaltron, M. Milocco, M. Volpe - SMS Group, Italy
B. Mellinghoff, H. J. Odenthal, U. Thiedemann - SMS Group, Germany

17.10 EAF SMARTrafo solution
R. Reboldi - TES Transformer Electro Service srl, Italy
S. Zanoni, B. Marchi, L. Mazzoldi - Università degli Studi di Brescia, Italy

17.30 Inductive melting in steelworks
Y. Yildir, E. Dötsch, M. Chaabet, H. Britechi - ABP Induction Systems GmbH, Germany

17.50 Options for vacuum generation for the VD-VOD Process
D. Tembergen, T. Eichert, J. Triplat - SMS Mevac GmbH, Germany
S. Petovar, A. Rozman - Metal Ravne, Slovenia

18.10 ILTEC – Mettop’s revolutionary cooling solution for the steel industry
M.B. Hanel, A. Filzwieser, I. Filzwieser, S. Ruhs - Mettop GmbH, Leoben, Austria
PROCESS CONTROL I
Chairperson: Mario Fennert - ESF Elbe Stahlwerke Feralpi, Germany

9.00 Steel Expert – rule based modelling for automatic production control at EAF steel plant Georgsmarienhütte, Germany
R. Hubmer - Primetals Technologies Austria GmbH, Austria
H. Haverkamp - Georgsmarienhütte GmbH, Germany

9.20 Charge mix management and process simulation for improvement of EAF process to Acciaierie di Calvisano
P. Frittella - Centro Sviluppo Materiali spa-Rina Group, Italy
L. Angelini, S. Filippini - Feralpi Siderurgica spa, Italy
A. Tolettini, G. Miglietta, N. Mora - Acciaierie di Calvisano, Italy

9.40 Robotic solution for the measurement and sample picking in an EAF
G. Maccani - BM spa, Borgo Chiese, Italy
R. Forelli - Polytec srl, Borgo Chiese, Italy
M. Bottini - BM Group Holding spa, Borgo Chiese, Italy

10.00 EAF process optimization through a modular automation system and an adaptive control strategy
M. Piazza, M. Ometto - Danieli Automation spa, Buttrio, Italy
F. Bianco, D. Patrizio - Danieli & C. Officine Meccaniche spa, Buttrio, Italy

10.30 coffee break
EFFICIENCY I
Chairperson: Klaus Krüger - Max Aicher, Germany

9.00  Liquid steel level measurement at Electric Arc Furnaces without increasing the power off time
V. Asier, I. Macaya - ArcelorMittal Basque Country Research Centre, Derio, Spain
J.A. Gutierrez, J.A. Arteche - Tecnalia Research & Innovation, Spain

9.20  Technologies for EAF energy optimization
F. Martinez, G. Fernandez - AMIGE, Mexico

9.40  Case Studies – Improving EAF operations by utilizing ALX™ graphite electrodes and the ArchiTech™ furnace evaluation system
B. Chiappelli - GrafTech International Holdings Inc., USA
D. Potey - GrafTech Switzerland S.A.
P. Stafford - GrafTech UK Ltd.

10.00 The importance of full spectrum off-gas analysis for EAF process control, optimization & safety
D.J. Zuliani, V. Scipolo - Tenova Goodfellow Inc., Mississauga, USA

10.30  coffee break
11.10 AMIGE SmartFurnace System implementation in KWT Steel  
G. Fernandez - AMIGE, Mexico  
F. Samimi - KWT Steel, Kuwait

11.30 New ways to enhance tapping procedure with latest IoT technology  
J. Roininen, P. Hooli, I. Luukkonen - Sapotech Oy, Finland  
K. Vallo - Outokumpu Stainless Oy, Finland

11.50 CEDIS® a powerful new tool for EAF melt shops  
N. Beever, B. Bryant, A. Wyatt, J. Kuntze, H. Fuchs - SGL Group, Wiesbaden, Germany

12.10 INTECO Furnace Optimization Box – A platform for ongoing process improvement in EAF operation  
C. Rust, G. Propst - INTECO Atec Automation GmbH, Austria  
L. Gemo, S. Miani, R. Pierer - INTECO Melting and Casting Technologies, Austria

12.30 Management system for scrap yard: mapping and automatic bucket charging  
N. Bertoni, F. Bagozzi - BM spa, Borgo Chiese, Italy  
A. Ferrari - Soft Technologies srl, Borgo Chiese, Italy

12.50 lunch
MODELLING I
Chairperson: Herbert Pfeifer - RWTH Aachen University, Germany

11.10  Modelling of EAF slag properties for improved process control
R. Pierre, B. Kleimt - VDEh-Betriebsforschungsinstitut GmbH, Germany
L. Schlinge - Georgsmarienhütte GmbH, Germany
I. Unamuno, A. Arteaga - GERDAU Investigation y Desarrollo Europa SA, Spain

11.30  Improvement of metallic yield for the EAF of Acciaierie di Calvisano through application of KPI’s approach
P. Frittella, A. Ventura - Centro Sviluppo Materiali spa-Rina Group, Italy
L. Angelini, S. Filippini - Feralpi Siderurgica spa, Italy
A. Tolettini, G. Miglietta, N. Mora - Acciaierie di Calvisano, Italy

11.50  OptiMet: an advanced charge optimizing model for EAF Steelmaking
S. Bets, E. Cesareo, A. Rolando, F. Venturi - NLMK Verona Spa, Verona, Italy
P. Fontana, B. Mazzarello - Iso Sistemi srl, Genova, Italy

12.10  simSPD: A unique solution for modeling, simulating and validating production systems, processes, material flows and logistic operations
D. Cuberli, L. Bortolin - Danieli & C. Officine Meccaniche Spa, Buttrio, Italy
M. Piazza, A. Merluzzi - Danieli Automation Spa, Buttrio, Italy

12.30  Study of water model experiments of combined blowing technology of 65t EAF
G. Ma, R. Zhu, T. Cheng, Z. Li, X. Wu, G. Wei - University of Science and Technology Beijing, China
I. Yang - Central South University, hunan China

12.50  lunch
OPERATIONAL RESULTS I
Chairperson: Hans-Jörg Krassnig - Inteco, Austria

14.20 Operational results of neural network based temperature control in primary and secondary metallurgy in ABS steelmaking plant
A. Spadaccini, R. Turco - Acciaierie Bertoli Safau, Udine, Italy
F. Bianco, V. Dimitrijevic - Danieli R&D, Buttrio, Italy
M. Piazza - Danieli Automation, Buttrio, Italy

14.40 Process benefits of ArcSave® technology in electric arc furnace
L. Teng, O. Sjöden - ABB AB, Västerås, Sweden
M. Meador - Steel Dynamics Inc., Roanoke, USA
P. Ljungqvist - Outokumpu Stainless AB, Avesta, Sweden

15.00 New developments and operational results in the use of fixed side-wall injectors in the electric arc furnaces
D. Tolazzi, C. Candusso, S. Marcuzzi - MORE srl, Italy

15.20 Operational results from the Inteco PTI Swingdoor™ installation at Marienhütte Graz
M. Leber - Inteco PTI, Tucker, USA
S. Griessacher - Marienhütte Graz, Austria

15.40 coffee break
14.20  Process modeling and simulation of an Electric Arc Furnace for comprehensive calculation of energy and mass transfers in combination with a model of the dedusting system
T. Meier, A. Hassannia Kolagar, T. Echterhof, H. Pfeifer - RWTH Aachen University, Germany

14.40  Advanced EAF Control using SmartFurnaces and ZoloSCAN
K. Grieshaber - Zolo Technologies, Louisville, USA
F. Martinez - AMIGE, Mexico

15.00  Analysis of benchmark models for EAF energy efficiency with application to process improvements by EAF gas purging
M. Kirschen, K-M. Zettl - RHI AG, Austria
T. Echterhof, H. Pfeifer - RWTH Aachen University, Germany

15.20  Physics-based modeling of the electric arc furnace process using object-oriented language modelica
F. Opitz, P. Treffinger - Offenburg University of Applied Sciences, Germany
J. Wöllenstein - Albert-Ludwigs-Universität Freiburg, Germany
R. Schweikle - BSE Badische Stahl-Engineering GmbH, Kehl, Germany

15.40  coffee break
OPERATIONAL RESULTS II
Chairperson: Ferruccio Pastorino - 3PIGREC, Italy

16.10  Ori Martin: the new environmentally friendly and energy efficient scenario. Operative results of the new Consteel® evolution and iRecovery® system
N. Monti, A. Grasselli, G. Di Zanni - Tenova spa, Milano, Italy
U. De Miranda, N. Gaudenzi, M. Zanforlin - Ori Martin spa, Brescia, Italy

16.30  Recent EAF operations improvements in Feralpi Stahl Riesa
J. Brhel - HTT Engineering spol. Sro, Brno, Czech Republic
M. Fennert, D. Sosin - ESF Elbe Stahlwerke Feralpi GmbH, Germany

16.50  EAF Quantum - Results of 2015
J. Apfel, A. Müller, H. Beile - Primetals Technologies Germany GmbH, Germany

17.10  Application and operational results of technological packages to eliminate the human operation around the EAF and improve the safety level
I. Filipovic, W. Cargnelutti, G. Londero - MORE srl, Gemona del Friuli, Italy

19.45  Social event
MODELLING III
Chairperson: Bernd Kleimt - VDEh-Betriebsforschungsinstitut, Germany

16.10 Simulation of electric steelworks: a way to predict environmental impact
I. Matino, V. Colla, V. Colucci, P. Lamia - Scuola Superiore Sant’Anna, Italy
S. Baragiola - Riva Acciaio spa, Italy
C. Di Cecca - Politecnico di Milano, Italy

16.30 Electric steelmaking coupled multiphysics simulation by finite elements
O. Koeser, B. Kalkunte - Calcom ESI SA, Lausanne, Switzerland
M. Samonds, M. Gyimesi - ESI US R&D, Columbia, MD, USA

16.50 About optimal management procedures of EAF
E.C. Dragna, A. Ioana, N. Constantin - University Politehnica of Bucharest, Romania
M. Pollifroni - University of Turin, Italy

17.10 Installation of NextGen® multipoint off-gas analysis technology at SDI Butler, IN
A. Spencer - Steel Dynamics Inc., USA
A. Pal, D.J. Zuliani, I. Todorovic, V. Scipolo - Tenova Goodfellow Inc., USA

19.45 Social event
DRI
Chairperson: Carlo Mapelli - Politecnico di Milano, Italy

9.00  Pig Iron – Direct Reduced Iron high temperature microstructural interaction
A.F. Ciuffini, C. Di Cecca, S. Barella, A. Gruttadauria, C. Mapelli - Politecnico di Milano, Italy

9.20  Iron oxide content in slag in a 100% DRI melting EAF: An economic approach
M.H. Saghafi, H. Sadeghian, H. Bahrami - Asyn Steel Engineering, Iran
M. Karimi, P. Azizi - PASARGAD Steel Complex, Iran

9.40  DRI-based EAF-steelmaking in Iran-example Hormozgan steel
B. Strohmeier - Strohmeier Consulting, South Africa
M.J. Parsi, E. Rasooli, H. Lohrasbi, M. Abouativi - Hosco, Iran

10.00 Study on yield of hot briquetted iron charge inside Electric Arc Furnace
C. Di Cecca, A.F. Ciuffini, S. Barella, C. Mapelli, A. Gruttadauria, D. Mombelli - Politecnico di Milano, Italy

10.20 Iron carbide as a strong contender for alternative iron input in EAF steelmaking in India
A. Ganguly - NIT Durgapur, India
A. Pandey - IIT Kanpur, India

11.00 coffee break
**Efficiency II**

Chairpersons: Klaus Krüger - *Max Aicher, Germany*
Cesare Giavani - *Tenova, Italy*

9.00 Latest trends in EAF optimization of scrap-based melting process: balancing chemical and electrical energy input for competitive and sustainable steelmaking
D. Patrizio, A. Pesamosca - Danielli & C. Officine Meccaniche spa, Italy

9.20 iEAF® at Industrie Riunite Odolesi: another successful installation of the Tenova holistic and dynamic process optimization system. Operative results
B.B. Ravandi, V. Scipolo - Tenova Goodfellow Inc., Mississauga ON, Canada
D. Masoero, R. Girelli - Tenova spa, Milano, Italy
M. Leali, A. Radoani - IRO spa, Odolo, Italy

9.40 The LM.3 – The new era of efficient energy input optimization in the EAF
A. Opfermann, F. Goekce, K. Libera, A. Grosse - Badische Stahl-Engineering GmbH, Germany

10.00 Optimization of chemical energy input using AMIGE SmartFurnace with ZoloSCAN laser off Gas analyzer at Nucor Hickman
G. Fernandez, S. Gonzalez - AMIGE, Mexico
I. Valdez - Nucor Hickman, USA

10.20 Economic evaluation of available EMS technologies aimed at improving EAF process efficiency
S. Pugnetti, S. De Monte, C. Persi - Ergolines Lab, Italy

10.40 EAF, beyond the optimum melting process
E. Sedano, J. Serrano, E. Kerejeta, U. Zanelli - Sarralle, Spain

11.00 *coffee break*
**Sustainability & Environment III**  
Chairperson: Katya Brunelli - *Università di Padova, Italy*

11.30 **Railway eco-friendly concrete using Electric Arc Furnace oxidizing slag**  
T.H. Koh, S-K. Hwang, H-J. Yoo - Korea Railroad Research Institute, Gyeonggi-Do, Korea

11.50 **EAF long term industrial trials of utilization of char from biomass as fossil coal substitute**  
F. Cirilli - Centro Sviluppo Materiali, Italy  
G. Baracchini, L. Bianco - Ferriere Nord, Italy

12.10 **Electric Steelmaking with ORC heat recovery in Europe and beyond**  
A. Foresti, D. Archetti - Turboden srl, Brescia, Italy

12.30 **Handling & joining graphite electrodes: safety first!**  
T. Piccardi, M. Piccardi - Piccardi srl, Italy

12.50 **Closing remarks**

13.00 **End of the Conference**

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**13.15 WORKSHOP organized by CSM**  
**Biochar for a sustainable EAF steel production - GREENEAF2**

The objective of the project is the validation for the utilization of char from biomass as substitute of coal in the electric furnace. A wide range of biochar and biomass (from different origin and treated with different technologies) have been collected and characterised at laboratory level. Industrial trials of EAF charging and injection have been carried out successfully.

Programme of the workshop:
- General presentation of the project
- Materials characterization
- Industrial injection tests
- Industrial charging tests
- Economic evaluations
- General discussion and conclusion

*The participation in the Workshop is free for the Conference attendees*
Efficiency III  
Chairperson: Cesare Giavani - Tenova, Italy

11.30  Development prospects of the integrated scrap preheating systems: analysis and implementation  
A. Partyka, L. Gemo, S. Miani - INTECO Melting and Casting Technologies GmbH, Bruck an der Mur, Austria  
A. Ehle, M. Huck - INTECO Fuchs GmbH, Offenburg, Germany

11.50  Optimizing the arc properties by adjusting the plasma composition transformation of first results to a large-scale EAF  
K. Krüger - Max Aicher GmbH & Co. KG, Germany  
B. Dittmer, T. Matschullat - Primetals Technologies Germany GmbH, Germany

12.10  Reduction in main EAF’s consumption by optimization slag compositions  
M. Momenzadeh, G. Salimi, A. Iranpor, A. Sheykhi - Mobarakeh Steel Company, Iran  
B. Strohmeier - Strohmeier Consulting, South Africa

12.30  Helios technology: a new concept for the measurement of diffusible hydrogen in steelmaking  
R. Valentini - Università di Pisa, Italy  
S. Corsinovi - Letomec srl, Pisa, Italy

12.50  Closing remarks in ARAZZI room

13.00  End of the Conference

13.15  WORKSHOP organized by CSM  
Biochar for a sustainable EAF steel production - GREENEAF2  
In ARAZZI room

The participation in the Workshop is free for the Conference attendees
Innovative process control for VOD with mechanical vacuum pumps
A. Teeuwsen - Edwards GmbH, Kirchheim, Germany
A. Villa - Edwards spa, Italy
J. Chantry - Edwards Ltd, United Kingdom

Cyber security for steelmaking process
G. Maccani, F. Melzani - BM spa, Borgo Chiese, Italy
A. Tonini - BM Group Holding spa, Borgo Chiese, Italy
A. Aceti - Kaspersky Lab, Milano, Italy

Analysis of electrical energy dissipation in submerged-arc furnaces producing silicomanganese
J.D. Steenkamp, C.J. Hockaday - Mintek, South Africa
J.P. Gous - Transalloys, South Africa

On the motion prediction of DRI particles from chute into slag in Electric Arc Furnace: theory and experiment
H. Sadeghian, H. AshtariNejad, M.H. Saghafi - Asyn Steel Engineering, Iran
P. Azizi, M. Karimi - Pasargad Steel Company

POSTERS WILL BE DISPLAYED FOR THE ENTIRE PERIOD OF THE CONFERENCE

Possible changes to the programme will be communicated during the Conference
GENERAL INFORMATION

➤➤ Conference Venue
The Conference will be held at the Giorgio Cini Foundation, that is located on the Island of San Giorgio Maggiore in Venice (www.cini.it).

➤➤ Language
The official language of the Conference will be English.

➤➤ Proceedings
The full text of the accepted papers will be published in the form of electronic proceedings and issued to attendees on arrival at the Conference. A selection of the best papers will also be published on “La Metallurgia Italiana – International Journal of the Italian Association for Metallurgy”, the scientific journal of AIM which is covered in the Science Citation Index Expanded by Thomson Reuters and in Scopus by Elsevier B.V.

➤➤ Accommodation
The Conference venue can rely on a great variety of accommodations situated in the surroundings, ranging from comfortable mid-range hotels, to religious hotel-quality accommodations. To book for accommodation, we invite you to contact the Conference official travel agency, Arzanà, by filling in the on-line hotel reservation form (http://eec2016.arzanadv.it/) For any further question, please refer to the official travel agency Arzanà (e-mail: eec2016@arzanadv.it - tel. +39 041 2750223). Due to a high demand of rooms in Venice, we recommend to book hotels at your earliest convenience to ensure availability.

➤➤ Conference schedule
May 24, 2016: Pre-registration, opening of the exhibition and welcome aperitif
May 25, 2016: Opening session and technical sessions
May 26, 2016: Technical sessions - social event
May 27, 2016: Technical sessions
REGISTRATION INFORMATION

Registration fees

STANDARD REGISTRATION FEES

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<th>AIM MEMBER</th>
<th>NON MEMBER</th>
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<td>COMMITTEE MEMBER</td>
<td>€ 570</td>
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<td>EXHIBITOR / SPONSOR</td>
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Additional ticket for social events: € 150 (22% VAT included)
(Includes only the welcome aperitif on May 24 and the social event on May 26.)

Conference Registration fees include admittance to technical sessions and to the exhibition, Conference bag with electronic proceedings, welcome aperitif on May 24, coffee breaks, lunches and the social event on May 26. For non-members the fee includes AIM Membership for the last three quarters of 2016 and for the year 2017.

* Students will have to provide valid proof of student status. The social event on May 26 is not included in the student registration fee.

Payment and remittance

- by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at “Banca Popolare Commercio e Industria (UBI Banca)”, Branch no. 2 - Via Borgogna, 2/4 - 20122 Milano- Italy, account no. 000000022325 - cod. ABI 05048 - CAB 01602 - cin L, IBAN: IT92L050480160200000022325, swift code BLOPIT22. The transfer order must specify the name of the delegate and the reference “EEC 2016”. A copy of the transfer order must be sent to AIM, together with the registration form.
- by credit card online (www.aimnet.it/eec2016.htm).

Cancellation and refund policy

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received by May 6, 2016. For attendees who notify their cancellation after May 6, 2016 or will not attend the Conference, a charge of 100% of the Conference fee will be withheld and a copy of the proceedings will be sent after the event.

Insurance

The Organising Secretariat cannot assume any responsibility for personal accident, loss or damage to the private property of participants and accompanying persons, which may either occur during or arise from the Conference. Participants should therefore take whatever steps they consider necessary as regards insurance.

Exhibition & Sponsorship opportunities

The exhibition will open in the afternoon of May 24, at 18.00 and run until May 27. For information: SIDERWEB (commerciale@siderweb.com)
Tel: +39 0302540006 - Fax +39 0302540041
Mobile/cell phone
Mobiles must be kept turned off or in silent mode in all Conference rooms.

Venice
Venice, “La Serenissima”, holds a mystical aura and is one of the most enchanting places in the world. Built on 117 small islands in a lagoon, Venice is a unique blend of water, art and romance with exquisite canals, charming bridges, magnificent palaces and churches, and world famous landmarks rising from the water’s surface up to sky. Whether skimming over a cozy canal on a gondola or strolling around its “calle”, visiting Venice is a magical experience for everyone. It is a treasure from the artistic and architectural point of view.

SOCIAL PROGRAMME
For the evening of May 26, the Conference organizers AIM has planned a Conference reception, in order to give delegates the opportunity to meet informally and enjoy Venice’s atmosphere:

19.45: Meeting point at Scuola Grande di San Rocco, where after a classical music concert, a stand-up buffet dinner will be offered.

SCUOLA GRANDE DI SAN ROCCO
The Confraternity of Saint Roch, founded in 1478 and immediately recognized by the Council of Ten, received the relic of Saint Roch’s body in 1485. Between 1517 and 1549, the Confraternity moved to one of the most prominent and captivating buildings in the city, one that preserves the extraordinary, original work of Tintoretto. The Confraternity of Saint Roch, which was made an “Archbrotherhood” in 1789 by Pio VI, has continued its activities without interruption up to present.
As the technology leader in the refractories sector, RHI develops innovative solutions for the Electric Arc Furnace. In close cooperation with our customers, our activities focus on the refractory products and their application to realize an optimum EAF steel production.
What connects the world originates with us. We plan, design, and construct plants worldwide for producing and processing steel, aluminum, and copper.

The result: Quality products that stand up to top strains ensure sustainable quality of life around the globe. And that brings us closer together.
Consteel® system.
Only from Tenova.

Tenova’s exclusive Consteel® system is the only fully tested industrial process in operation today that continuously pre-heats and feeds metallic charge (scrap, pig iron, DRI, etc.) to the EAF, while simultaneously controlling gaseous emissions.

With the latest Consteel® generation – Consteel Evolution – Tenova moves the frontier of innovation forward. Its new solutions integrate the expertise and know-how gained over the years to modify the flow of fumes and so increase the volume and efficiency of the chemical energy used in the process. The result is improved pre-heating.

More than 20 years after the first industrial installation, with more than 40 systems installed before the Consteel® Evolution, Tenova’s Consteel® system is the best EAF charging solution on the market today, a leadership achieved through maximum availability, efficient use of energy and raw materials, easy operation and maintenance, and respect for the environment.

Discover all the benefits of the original Consteel® system. Don’t settle for imitations.

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