

# 5<sup>th</sup> International Freiberg Conference on IGCC & XtL Technologies

21 - 24 May, 2012  
Leipzig, Germany




## Programme

Sunday 20 May – Thursday 24 May  
Penta Hotel Leipzig

### Sunday 20 May 2012

18:00 – 20:00	Registration
19:00 – 21:00	P4+P5 - Welcome Evening Penta Hotel Leipzig

### Monday 21 May 2012

09:00 – 09:20	P2+P3 Conference Centre - Opening Ceremony / Prof. Bernd Meyer, Dr. Jason Laumb	
09:20 – 10:50	<b>Plenary Session</b>	
		<p>Dr. Michael L. Jones - Vice President – Research &amp; Development, Lignite Energy Council [USA]</p> <p>Dr. Michael L. Jones is the vice president of research and development for the Lignite Energy Council and is the technical advisor to the North Dakota Industrial Commission. Previously, he had held numerous positions at the Energy &amp; Environmental Research Center most recently as senior research advisor focused on advanced options for low rank coals and an adjunct professor of physics at the University of North Dakota. He received his Ph.D. and M.S. in physics at the University of North Dakota and his B.S. in physics from Bemidji State University. As Minnesota native, he joined the Lignite Energy Council in 2009.</p>
		<p>Dr. Andrew Minchener - IEA Clean Coal Centre [UK]</p> <p>Dr. Andrew Minchener has over 35 years experience of fossil fuel and biomass/waste utilisation systems development, including considerable involvement in clean coal and carbon capture and storage (CCS) related activities both within Europe and the Far East. He was the Industrial Energy &amp; Environment Director at CRE Group Ltd., an offshoot of the British Coal Corporation Coal Research Establishment. Since 2002, he has worked closely with the IEA Clean Coal Centre and the UK Department of Energy &amp; Climate Change, as well as with the World Bank, Asian Development Bank, the International Energy Agency and the European Commission. His presentation covers the coal based power and non-power coal utilisation sectors in China, with emphasis on coal gasification and CCS.</p>
		<p>Prof. Michael Nippa - Chair of Management, Leadership and Human Resources, TU Bergakademie Freiberg [Germany]</p> <p>Prof. Michael Nippa is Professor of Management, Leadership, and Human Resources at the Technische Universität Bergakademie Freiberg since 1996. Prior he was a managing partner of a management consulting firm and worked for various renowned corporations. He has been a Visiting Scholar at the University of Southern California, Australian Graduate School of Management, and Adjunct Professor of Management at the Singapore Management University. His research integrates international management, strategic leadership, organization, innovation management and decision-making and is published in national and international peer-reviewed journals. As vice-chairman of the German Centre for Energy Resources (DER) he is responsible for innovation management and education related research.</p>

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## Monday 21 May 2012

08:30 – 16:00	Registration	
09:00 – 16:00	P1 Posters and Exhibition	
09:00 – 09:20	P2+P3 Conference Centre - <b>Opening Ceremony: Prof. Bernd Meyer, Dr. Jason Laumb</b>	
09:20 – 10:50	P2+P3 Conference Centre - <b>Plenary Session</b> Chair: Chris Higman	
09:20 – 09:50	Gasification of lignite coal in North America; Past experience and future opportunities / Dr. Michael L. Jones – Lignite Energy Council [USA]	
09:50 – 10:20	CCS challenges and opportunities for China / Dr. Andrew Minchener – IEA Clean Coal Centre [UK]	
10:20 – 10:50	Another case of 'same bed, different dreams'? On the need and value of intensified interdisciplinary research in the field of energy resources / Prof. Dr. Michael Nippa – TU Bergakademie Freiberg [Germany]	
10:50 – 11:20	<b>Coffee Break</b>	
11:20 – 12:40	P2+P3 Conference Centre - <b>Session 1: Entrained Flow Gasification</b> Chair: Robert Davidson	P4+P5+P6 Parallel Session - <b>Session 2: Solid Feedstock</b> Chair: Pedro Casero
11:20 – 11:40	01-1: Concepts for a clean, economic and sustainable fuel and energy production / Rhys Tucker – Thyssen Krupp Uhde GmbH [Germany]	02-1: Organic petrology as a main instrument to investigate the inner constitution of coal – competences and visions / Kristin Börner – TU Bergakademie Freiberg [Germany]
11:40 – 12:00	01-2: Development of Shell's next generation hybrid gasifier / Sander van Paasen – Shell Global Solutions [Netherlands]	02-2: SECTOR – production of solid sustainable energy carriers from biomass by means of torrefaction / Robin Zwart – Energy Research Centre of the Netherlands [Netherlands]
12:00 – 12:20	01-3: Development, demonstration and application of opposed multi-burner coal gasification process / Dr. Zhijie Zhou – East China University of Science and Technology [China]	02-3: Torrefied biomass pellets as coal substitute in gasification plants / Dr. Javier Gil – CENER National Renewable Energy Centre [Spain]
12:20 – 12:40	01-4: Development and engineering of a synthetic gas cooler concept integrated in a Siemens gasifier design / Ulrich Guenther – Siemens Fuel Gasification Technology GmbH & Co.KG [Germany]	02-4: Efficient carbon footprint reduction via EF gasification of coal / torrefied woody biomass blends / Michiel Carbo – Energy Research Centre of the Netherlands [Netherlands]
12:40 – 13:40	<b>Lunch</b>	
13:40 – 15:20	P2+P3 Conference Centre - <b>Session 3: Biomass Gasification</b> Chair: Prof. Rajender Gupta	P4+P5+P6 Parallel Session - <b>Session 4: Mineral Matter</b> Chair: Prof. Hartmut Spliethoff
13:40 – 14:00	03-1: Pilot plant experiments for syngas generation via biomass gasification / Dr. Magnus Marklund – Energy Technology Centre [Sweden]	04-1: Coal ash behaviour in reducing environments (CABRE) III / Joshua Stanislawski – Energy & Environmental Research Center (EERC) [USA]
14:00 – 14:20	03-2: New 2 MW gasification pilot plant at CB2G / Idoya Goñi – CENER National Renewable Energy Centre [Spain]	04-2: Application of Factsage <sup>TM</sup> equilibrium simulations to quantify the effect of mineral types on slag formation during thermal conversion of coal / Dr. Johan van Dyk – Sasol Technology R&D [South Africa]
14:20 – 14:40	03-3: Biomass gasification behaviour in an entrained flow reactor / Lin Weigang – Technical University of Denmark [Denmark]	04-3: Effect of Biomass Addition on ash fusion characteristic of coal with high ash melting point / Dr. Zhijie Zhou – East China University of Science and Technology [China]
14:40 – 15:00	03-4: Gasification kinetics and CFD simulation oil sand fluid coke in an entrained flow gasifier / Prof. Rajender Gupta – University of Alberta [Canada]	04-4: Mineral composition of ash using X-ray diffractometry / Dr. Monika Kurková – TU Bergakademie Freiberg [Germany]
15:00 – 15:20		04-5: Effect of H <sub>2</sub> S concentration in gasified gas on the microstructure and leaching behaviour of coal slag / Yajuan Wei – Chubu University [Japan]
15:20 – 15:50	<b>Coffee Break</b>	
15:50 – 17:10	P2+P3 Conference Centre - <b>Session 5: Coal Preparation and Feeding</b> Chair: Frank Hannemann	P4+P5+P6 Parallel Session - <b>Session 6: Special Topics</b> Chair: Dr. Stefan Guhl
15:50 – 16:10	05-1: Dry solids pump development and commercial-scale testing / Timothy Saunders – Pratt & Whitney Rocketdyne [USA]	06-1: Modelling and experimental determination of material properties relevant for high temperature processes / Arne Bronsch – TU Bergakademie Freiberg [Germany]
16:10 – 16:30	05-2: Fundamental research of briquetting press applicability as feeding system for pressurized reactors / Alexander Rosin – TU Bergakademie Freiberg [Germany]	06-2: Alkali removal at 1400 °C under gasification conditions / Dr. Michael Müller – Forschungszentrum Jülich [Germany]
16:30 – 16:50	05-3: Customised gasifier feed pumps / Heinz M. Nägel – Feluwa Pumpen GmbH [Germany]	06-3: Magnesia-carbon refractories for the lining of gasification chambers: technical capabilities and limitations / Dr. Michael Hampel – TU Bergakademie Freiberg [Germany]
16:50 – 17:10	05-4: Lockhopper isolation valve for coal application / Jose del Buey – Velan Inc. [Canada]	06-4: Radiotracer in process investigation / Dr. Albert Zeuner – Fraunhofer Institute Nondestructive Testing [Germany]
18:00 – 22:00	<b>Concert Thomaskirche / Conference Dinner Auerbachs Keller</b>	

### Exhibitors

Salon Leipzig 1



## Tuesday 22 May 2012

08:00 – 16:00	Registration	
08:30 – 16:00	P1 Posters and Exhibition	
08:30 – 10:10	<b>P2+P3 Conference Centre - Session 7: IGCC and Polygeneration Concepts</b> Chair: Prof. Manfred Wirsum	<b>P4+P5+P6 Parallel Session - Session 8: Advanced Process Technology</b> Chair: Højlund Nielsen
08:30 – 08:50	07-1: Technological and economic evaluation of large scale polygeneration concepts for load flexible electricity generation / Robert Pardemann – TU Bergakademie Freiberg [Germany]	08-1: ITM oxygen supply: scaling up toward gasification applications / VanEric Stein – Air Products and Chemicals [USA]
08:50 – 09:10	07-2: Comparative performance assessment of IGCC and USC plants integrated with CO <sub>2</sub> capture systems / Dr. Vittorio Tola – University of Cagliari [Italy]	08-2: SOFC-Field Tests with biomass gasification derived product gas for the evaluation of stationary big-SOFC-micro-GT-CHP-concepts / Markus Kleinhappel - Bioenergy2020+ GmbH [Austria]
09:10 – 09:30	07-3: Advanced modelling and simulation of IGCC concepts with carbon capture / Mathias Rieger – TU Bergakademie Freiberg [Germany]	08-3: Flexible Energy by high temperature electrolysis / Alexander Tremel - Siemens AG [Germany]
09:30 – 09:50	07-4: Economic and modelling evaluation of carbon capture and storage technologies integrated into coal to liquids plants / Claudia Bassano – ENEA Italian Agency for New Technologies [Italy]	08-4: Development of an oxyfuel burner for gas turbine application / Dr. Peter Kutne – Deutsches Zentrum für Luft- und Raumfahrt [Germany]
09:50 – 10:10		08-5: Development of the advanced hydrogen turbine technology for IGCC plants with low emissions / Dr. Anatoly Sobolevskiy – Siemens Energy [USA]
10:10 – 10:40	<b>Coffee Break</b>	
10:40 – 12:00	<b>P2+P3 Conference Centre - Session 9: Moving Bed Coal Gasification</b> Chair: Dr. Steffen Krzack	<b>P4+P5+P6 Parallel Session - Session 10: Pyrolysis</b> Chair: Dr. Hubert Höwener
10:40 – 11:00	09-1: Mark+ - The next generation of Lurgi's FBDB gasifier / Dr. Henrik Timmermann – Air Liquid E&C / Lurgi GmbH [Germany]	10-1: Pyrolysis behaviour of brown coal in a pressurised drop tube reactor / Denise Reichel – TU Bergakademie Freiberg [Germany]
11:00 – 11:20	09-2: The overall reaction kinetics for the devolatilisation of large coal particles / Prof. Raymond Everson – North-West University [South Africa]	10-2: Influence of catalysts on the pyrolysis of lignites / Prof. Mathias Seitz – Hochschule Merseburg [Germany]
11:20 – 11:40	09-3: The BGL – Commercial plants and pilot testing / Mathias Olschar - Envirotherm GmbH [Germany]	10-3: Analysis of pyrolysis oils from biomass and coal / Philipp Rathsack – TU Bergakademie Freiberg [Germany]
11:40 – 12:00	09-4: Modelling coal-particle fragmentation inside a moving-bed gasifier / Franz Holzleithner – Vienna University of Technology [Austria]	10-4: Reduction of mercury content in coal by low temperature pyrolysis / Edyta Misztal – Institute for Chemical Processing of Coal [Poland]
12:00 – 13:00	<b>Lunch</b>	
13:00 – 14:20	<b>P2+P3 Conference Centre - Session 11: Processing of low-grade Coal</b> Chair: Dr. David Harris	<b>P5+P6 Parallel Session - Session 12: Gas Purification</b> Chair: Karsten Radtke
13:00 – 13:20	11-1: Modelling-based evaluation of gasification processes for high-ash coals / Martin Gräbner – TU Bergakademie Freiberg [Germany]	12-1: Options for tar reforming in biomass gasification / Dr. Klas Andersson – Haldor Topsøe A/S [Denmark]
13:20 – 13:40	11-2: The effects of operation parameter on the performance of entrained-flow pulverized coal gasifier with high fusion temperature coal / Dr. Zhenghua Dai – East China University of Science and Technology [China]	12-2: High-temperature-high-pressure syngas cleaning in the bioliq® bTL process / Hans Leibold – Karlsruhe Institute of Technology [Germany]
13:40 – 14:00	11-3: Fluidized bed gasification of high-ash coals with oxygen enriched air: An experimental and modelling study / André Engelbrecht – CSIR [South Africa]	12-3: Lab-scale studies for regenerable sorbent selection for CO <sub>2</sub> capture with H <sub>2</sub> production in IGCC processes / Marta Maroño – Centre for Energy, Environmental and Technological Research [Spain]
14:00 – 14:20	11-4: Gasification behaviour of Rhenish lignite: laboratory characterisation / Dr. Daniel Roberts – CSIRO Energy Technology [Australia]	12-4: Process integrated carbon capture (CC) – field tests and further perspectives in industrial processes / Markus Kleinhappel – Bioenergy2020+ GmbH [Austria]
14:20 – 14:50	<b>Coffee Break</b>	
14:50 – 16:30	<b>P2+P3 Conference Centre - Session 13: Syntheses and Ctl Concepts</b> Chair: Dr. Jason Laumb	<b>P5+P6 Parallel Session - Session 14: Gasification Modelling and Validation</b> Chair: Prof. Christian Hasse
14:50 – 15:10	13-1: A comparison of warm- and cold-gas cleanup for Fischer-Tropsch synthesis from coal-derived syngas / Joshua Strege – Energy & Environmental Research Center (EERC) [USA]	14-1: Helmholtz virtual institute for gasification technology: towards sustainable energy systems / Prof. Thomas Kolb – Karlsruhe Institute of Technology [Germany]
15:10 – 15:30	13-2: Update on STF technology – Freiberg test plant for the production of high octane gasoline from synthesis gas / Dr. Mario Kuschel – Chemieanlagenbau Chemnitz [Germany]	14-2: Implementation and validation of an advanced subgrid scale heterogeneous combustion model for coal gasification / Dr. Michele Vascellari – TU Bergakademie Freiberg [Germany]
15:30 – 15:50	13-3: Attractive process routes for the production of secondary energy carriers out of lignite / Bruno Sailer – RWE Power AG [Germany]	14-3: Influence of coal blend component kinetics on entrained flow gasification performance / Lars-Erik Gärtner – TU Bergakademie Freiberg [Germany]
15:50 – 16:10	13-4: Elcogas 14 MWth pre-combustion carbon dioxide capture pilot: technical & economical achievements / Pedro Casero – Elcogas [Spain]	
16:10 – 16:30	13-5: Bench-scale study of separation of H <sub>2</sub> from gasification gases using a Pd-based membrane reactor / Dr. Josemaría Sánchez - Centre for Energy, Environmental and Technological Research [Spain]	
16:30 – 16:50	13-6: R&D Packages of the Deutsches Brennstoff Institut DBI:bergakademie / Prof. Bernd Meyer – TU Bergakademie Freiberg [Germany]	
18:00 – 19:30	<b>Guided city tour</b>	

## Tuesday 22 May 2012 German Session



12:00 – 13:00	<b>Mittagessen - Lunch</b>
13:00 – 17:00	<b>P4 Sonderkolloquium 60. Jahrestag erster BHT-Koksabzug – Colloquium 60th anniversary of the first BHT coke discharge</b> Session language will be German. Moderation: Dr. Steffen Krzack
13:00 – 13:10	Begrüßung ( <i>Welcome</i> ) / Prof. Bernd Meyer – TU Bergakademie Freiberg
13:10 – 13:40	Technische und Technologische Entwicklung der klassischen Braunkohlen Hochtemperatur Verkokung ( <i>Technical and Technological development of the classical brown coal high temperature coking</i> ) / Klaus Jähnig – Traditionsverein Braunkohle Lauchhammer e.V., Dr. Herbert Richter – GTG Unternehmensberatung – Traditionsverein Glückauf Schwarze Pumpe e. V.
13:40 – 15:00	Neue Verfahren zur Herstellung von Stück- und Kornkoxen aus Braunkohlen und nichtbackenden Steinkohlen ( <i>New processes for the production of lump and grain coke from brown and non-baking hard coal</i> ) / Prof. i. R. Wolfgang Naundorf Teil 1: Grundlagen und Laborergebnisse ( <i>Fundamentals and experimental results</i> ) Teil 2: Verfahren und Forschungsbedarf ( <i>Processes and need for research</i> )
15:00 – 15:30	<b>Kaffeepause – Coffee Break</b>
15:30 – 16:00	Koksstauberzeugung aus Braunkohle ( <i>Production of coke dust from brown coal</i> ) / Andreas Jochmann – Vattenfall Europe, Dr. Herbert Richter – GTL Unternehmensberatung – Traditionsverein Glückauf Schwarze Pumpe e. V.
16:00 – 16:30	Heutige Qualitätsanforderungen an Hochofenkoks ( <i>Today's quality requirements for blast furnace coke</i> ) / Peter Liszio – KBS Kokereibetriebsgesellschaft Schweglern GmbH
16:30 – 17:00	Forschungsaktivitäten zur Pyrolyse und Kokscharakterisierung am IEC seit den 1990er Jahren ( <i>Research activities for pyrolysis coke characterisation at the IEC since 1990</i> ) / Dr. Steffen Krzack – TU Bergakademie Freiberg

## Wednesday 23 May 2012

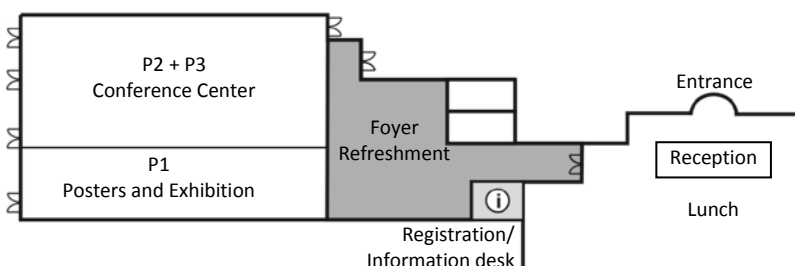
08:00 – 12:00	Registration
08:30 – 12:00	P1 Posters and Exhibition
08:30 – 09:50	<b>P2+P3 Conference Centre - Session 15: Application and Development of Partial Oxidation</b> Chair: Dr. Joachim Wolff
08:30 – 08:50	15-1: Shell in gasification: Delivering performance today, and developing technology and deployment solutions for tomorrow / Dr. Joachim Wolff – Shell Global Solutions International BV [Netherlands]
08:50 – 09:10	15-2: CO <sub>2</sub> valorization in GasPOx / Karsten Löffler – Air Liquide R&D [Germany]
09:10 – 09:30	15-3: The pilot trial of air-blown entrained-flow coal gasification / Dr. Zhenghua Dai – East China University of Science and Technology [China]
09:30 – 09:50	15-4: High pressure oxyfuel process with staged combustion / Hanno Tautz – Linde Engineering [Germany]
09:50 – 10:20	<b>Coffee Break</b>
10:20 – 12:00	<b>P2+P3 Conference Centre - Session 16: Gasification Kinetics</b> Chair: Prof. Raymond Everson
10:20 – 10:40	16-1: Investigation of gasification kinetics with lignite char and steam in a pressure less drop-tube-reactor / Sascha Russig – TU Bergakademie Freiberg [Germany]
10:40 – 11:00	16-2: Intrinsic reactivity investigations of biomass and coal chars, and their blends / Prof. Naoko Ellis – University of British Columbia [Canada]
11:00 – 11:20	16-3: Pressurized CO <sub>2</sub> -gasification of coal / Grzegorz Tomaszewicz – Institute for Chemical Processing of Coal [Poland]
11:20 – 11:40	Closing Ceremony
11:40 – 12:40	<b>Lunch</b>
13:00 – 18:30	<b>Technical Tour 1 Mibrag and Romonta</b>

## Thursday 24 May 2012

08:00 – 18:00	<b>Technical Tour 2 Freiberg</b>	<b>Technical Tour 3 Rüdersdorf</b>
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### Site map

Ground floor:



First floor:

