

CONFERENCE PROGRAMME  
TUESDAY, 13 JUNE 2017

08:30	<b>1BO.1</b> T1.5	<b>2BO.2</b> T2.4	<b>3BO.3</b> T3.6	<b>5BO.4</b> T5.1	<b>2BV.1</b> T2.1/2.2/ 2.3	<b>EXHIBITION</b>
10:30	Break					
10:45	<b>Plenary Session 1BP.1</b>					
	<b>Plenary Session 2BP.2</b>					
	<b>Plenary Session 3BP.3</b>					
12:30	Lunch Break					
13:30	<b>1BO.5</b> T1.5	<b>2BO.6</b> T2.4	<b>3BO.7</b> T3.6	<b>1BO.8</b> 16.5	<b>5BV.2</b> T5.1/5.2	
15:00	Break					
15:15	<b>4BO.9</b> T4.1	<b>2BO.10</b> T2.5	<b>3BO.11</b> T3.2	<b>1BO.12</b> 16.4	<b>3BV.3</b> T3.6	
16:45	Break					
17:00	<b>4BO.13</b> T4.2	<b>2BO.14</b> T2.5	<b>3BO.15</b> T3.2	<b>1BO.16</b> 16.3	<b>3BV.4</b> T3.7	
18:30						

TUESDAY

<b>1 Biomass Resources</b> T1.5 Municipal and industrial wastes
<b>2 Biomass Conversion Technologies for Heating, Cooling and Electricity</b> T2.1 Production and supply of solid biofuels T2.2 Biomass and bioliquids combustion for small and medium scale applications T2.3 Biomass combustion in large utilities T2.4 Gasification for power, CHP and polygeneration T2.5 Gasification for synthesis gas production
<b>3 Biomass Conversion Technologies for fuels, chemicals and materials</b> T3.2 Pyrolysis and other biomass liquefaction technologies T3.6 Biorefineries T3.7 Production and application of biobased chemicals
<b>4 Biomass Policies, Markets and Sustainability</b> T4.1 Market implementation, investments & financing T4.2 Sustainability, certification and standards
<b>I Industry Sessions</b> 6.3 Power & Heat processes and systems 6.4 Biochemical Conversion 6.5 Policy
<b>5 Bioenergy in integrated energy systems</b> T5.1 Integration of bioenergy with other renewable and conventional energy sources, combination of energetic and material use T5.2 Bioenergy and grid balancing

**08:30 - 10:00**

**ORAL SESSION 1BO.1**

**Innovations in Municipal and Industrial Biowaste Feeding a Biobased and Circular Economy**

ROOM: K21

**CHAIRPERSONS:**

**Silvia MALTAGLIATI**, ARPAT-Environmental Protection Agency of Tuscany  
seconded at the European Commission DG Research, BELGIUM

**Peter KUIKMAN**, Alterra Wageningen UR, THE NETHERLANDS

**1BO.1.1**

**THE BIO2ENERGY PROJECT: BIOENERGY, BIOFUELS AND BIOPRODUCTS FROM MUNICIPAL SOLID WASTE AND SEWAGE SLUDGE**

Francesco BALDI, PIN S.c.r.l., ITALY

Co-authors: I. Pecorini, University of Florence, Department of Industrial Engineering, Italy; D. Bacchi, E. Albini, PIN S.c.r.l. - Servizi didattici e scientifici per l'Università di Firenze, Italy; P. Rossi, P. Paoli, E.A. Carnevale, G. Ferrara, DIEF - Department of Industrial Engineering, University of Florence, Italy; L. Ferrari, DESTEC - Department of Energy, Systems, Territory and Construction Engineering, University of Pisa, Italy; M. Peruzzini, Italian National Council for Research, ICCOM, Florence, Italy; L. Lombardi, University Niccolò Cusano, Rome, Italy

**1BO.1.2**

**BIOPLASTICS AND BIOFUELS FROM URBAN ORGANIC WASTES**

Paolo PAVAN, University Cà Foscari of Venice, Environmental Sciences Dpt., ITALY

Co-authors: M. Majone, University of Rome La Sapienza, Italy; D. Bolzonella, University of Verona; F. Fatone, Polytechnical University of Marche Region, Ancona, Italy; F. Cecchi, Innoven srl, Verona, Italy

**1BO.1.3**

**ENHANCED FATTY ACID GENERATION FROM MEAT PROCESSING DISSOLVED AIR FLOTATION SLUDGE USING A QUASI-HOMOGENOUS CATALYST**

Zhifa SUN, Otago University, Physics Dpt., NEW ZEALAND

Co-authors: O. Okoro, J. Birch, Otago University, Dunedin, New Zealand

**1BO.1.4**

**EVALUATION OF INDUSTRIAL PRUNUS CERASUS LIQUOR WASTE AS A SOURCE OF ADDED VALUE CHEMICAL PRODUCTS AND ENERGY**

Ana Luisa FERNANDO, Universidade Nova de Lisboa, Ciências e Tecnologia Biomassa Dpt., PORTUGAL

Co-authors: E. Mauricio, CBIOS/Universidade Lusofona; Elisa Camara, Lisboa, Portugal; M.P. Duarte, METRICs/DCTB/FCT/UNL, Lisboa, Portugal; C. Rosado, CBIOS/Universidade Lusofona, Lisboa, Portugal; A.M. Diaz-Lanza, Universidad de Alcalá, Madrid, Spain

**1BO.1.5**

**MAPPING ORGANIC WASTE POTENTIALS FROM HOUSEHOLDS**

Lea BOEHME, Institute for Sanitary Engineering, Water Quality and Solid Waste Management, SKA Dpt., GERMANY

Co-authors: A. Fritzsche, P. Pilsl, D. Clauss, M. Kranert, University of Stuttgart, Germany

08:30 - 10:00

ORAL SESSION 2BO.2

Gasification Integrated Systems

ROOM: K2

**CHAIRPERSONS:**

**Wiebren DE JONG**, Delft University of Technology, THE NETHERLANDS

**Matthias KUBA**, Bioenergy 2020+, AUSTRIA

**2BO.2.1**

**CLOSING THE LOOP: CHEMICAL COMPOSITION AND ECONOMICS OF BUILDING BLOCKS/MONOMERS FROM INDIRECT GASIFICATION OF WASTE**

Berend VREUGDENHIL, Energy Research Centre of the Netherlands, Bio Energy & Efficiency Dpt., THE NETHERLANDS

Co-authors: A.J. Grootjes, G. Aranda Almansa, P. Kroon, Energy Research Centre of the Netherlands, Petten, The Netherlands

**2BO.2.2**

**SORPTION ENHANCED REFORMING WITH THE NOVEL DUAL FLUIDIZED BED TEST PLANT AT TU WIEN**

Johannes Christian SCHMID, TU Wien, Institute of Chemical Engineering, AUSTRIA

Co-authors: J. Fuchs, F. Benedikt, S. Mueller, H. Hofbauer, TU Wien, Vienna, Austria

**2BO.2.3**

**CATALYTIC GASIFICATION OF PIGHAIR BIOWASTES WITH HYDROGEN GENERATION OVER NIO/AL<sub>2</sub>O<sub>3</sub> CATALYST FOR AN INTEGRATED FUEL PROCESSOR**

Chao-Lung CHIANG, Yuan Ze University, Chemical Engineering and Material Science Dpt., TAIWAN

Co-authors: K.S. Lin, Yuan Ze University, Taoyuan, Taiwan; J.C.S. Wu, K.C.W. Wu, National Taiwan University, Taipei, Taiwan; Y.Z. Huang, Chung Yuan Christian University, Taoyuan, Taiwan

**2BO.2.4**

**GASIFICATION OF GRAPEVINES PRUNING RESIDUES INTO A FUEL FLEXIBLE GASIFICATION SYSTEM: EXPERIMENTAL INVESTIGATION**

Roberto MUSSI, Yanmar R&D Europe, ITALY

Co-authors: L. Pezzola, A. Bellissima, Yanmar R&D Europe, Florence, Italy; A.M. Rizzo, University of Florence, Florence, Italy; H. Wakizaka, Yanmar biomass power generation group, Maibara, Japan; D. Chiamonti, RE-CORD, Florence, Italy

**2BO.2.5**

**CONVERSION OF TARS ON SOFC ANODES**

Tobias HERRMANN, University of Erlangen-Nuremberg, Chair of Energy Process Engineering, GERMANY

Co-authors: M. Dillig, J. Karl, Chair of Energy Process Engineering, Friedrich-Alexander-University of Erlangen-Nuremberg, Nürnberg, Germany

08:30 - 10:00

ORAL SESSION 3BO.3

Biorefinery Processes

ROOM: K1

**CHAIRPERSONS:**

**Yukihiko MATSUMURA**, Hiroshima University, JAPAN

**Wouter HUIJGEN**, Energy Research Centre of the Netherlands, THE NETHERLANDS

**3BO.3.1**

**MILD ORGANOSOLV FRACTIONATION OF LIGNOCELLULOSIC BIOMASS FOR FEEDSTOCK FLEXIBLE BIOREFINERIES.**

Arjan SMIT, Energy Research Center of the Netherlands, Biomass & Energy Efficiency Dpt., THE NETHERLANDS

**3BO.3.2**

**CATALYTIC REDUCTIVE FRACTIONATION: INTRODUCING THE LIGNIN-FIRST BIOREFINERY**

Tom RENDERS, KU Leuven, Center for Surface Chemistry and Catalysis, BELGIUM  
Co-authors: W. Schutyser, S. Van den Bosch, S.-F. Koelewijn, B. Sels, KU Leuven, Leuven, Belgium

**3BO.3.3**

**PALM KERNEL MEAL (PKM) AND GRASS: VALORISATION OF NON-WOODY BIOMASS STREAMS BY CONVERSION TO BIO-ENERGY AND BIO-BASED PRODUCTS**

Pavlina NANOOU, Energy Research Centre of the Netherlands, Biomass and Energy Efficiency Dpt., THE NETHERLANDS

Co-authors: E.R.P. Keijsers, K.P.H. Meesters, B. Beelen, FBR, Wageningen, The Netherlands; J.R. Pels, M.C. Carbo, Energy Research Centre of the Netherlands, Petten, The Netherlands

**3BO.3.4**

**MECHANOCATALYSIS OF LIGNOCELLULOSIC BIOMASS - AN INNOVATIVE BIOECONOMIC SOLUTION FOR BIOFUEL, BIOCHEMICAL AND ENERGY PRODUCTION**

Laura SCHNEIDER, Oulu University, Research Unit of Sustainable Chemistry, FINLAND

Co-authors: J. Haverinen, M. Jaakkola, CEMIS Oulu, Kajaani, Finland; U. Lassi, Oulu University, Finland

**3BO.3.5**

**IMPROVEMENT OF BIOENERGY YIELDS OBTAINED FROM DUCKWEED BY SEQUENTIAL ETHANOL FERMENTATION AND ANAEROBIC DIGESTION**

Ozgul CALICIOGLU, The Pennsylvania State University, Civil and Environmental Engineering Dpt., USA

Co-author: R. Brennan, Penn State University, Department of Civil and Environmental Engineering, University Park, USA

08:30 - 10:00

ORAL SESSION 5BO.4

Bioenergy Integration in Energy Systems

ROOM: K23+K24

**CHAIRPERSONS:**

**Bernd KRAUTKREMER**, Fraunhofer IWES, GERMANY

**Andreas HORNING**, Fraunhofer-Institut UMSICHT, GERMANY

**5BO.4.1**

**“THINK AND PRODUCE” INSTEAD OF “PRODUCE AND FORGET” -  
INTEGRATION OF RES INTO AN ECONOMIC MARKET SYSTEM**

Kilian HARTMANN, Aschaffenburg University of Applied Sciences, Faculty of Engineering, GERMANY

Co-author: D. I. Candra, Aschaffenburg University of Applied Sciences, Germany

**5BO.4.2**

**THE ROLE OF BIOECONOMY IN CO2 MITIGATION THROUGH THE ENERGY  
SYSTEM - A SCENARIO ANALYSIS FOR THE NETHERLANDS**

Ric HOEFNAGELS, Utrecht University, Copernicus Institute, THE NETHERLANDS

Co-authors: I. Tsiropoulos, M. van den Broek, Utrecht University, The Netherlands; M.K. Patel, Geneva University, Switzerland; A.P.C. Faaij, Groningen University, The Netherlands

**5BO.4.3**

**FLEXIBLE BIOGAS PLANTS AS SERVANT FOR POWER PROVISION SYSTEMS  
WITH HIGH SHARES OF RENEWABLES: CONTRIBUTIONS TO THE REDUCTION  
OF THE RESIDUAL LOAD IN GERMANY.**

Markus LAUER, DBFZ-German Biomass Research Centre, Bioenergy Systems Dpt., GERMANY

Co-authors: P. Röppischer, University of Leipzig, Faculty of Mathematics and Computer Science, Germany; D. Thrän, UFZ Helmholtz-Zentrum für Umweltforschung, Leipzig, Germany

**5BO.4.4**

**INTEGRATED UTILIZATION PATHWAYS FOR BIOGENIC CO2 IN BIOMASS  
DRIVEN INDUSTRY SECTORS**

Janne KÄRKI, VTT Technical Research Centre of Finland, FINLAND

Co-authors: E. Tsupari, C. Bajamundi, S. Kouri, M. Hurskainen, VTT Technical Research Centre of Finland, Jyväskylä, Finland

**5BO.4.5**

**CHEMICAL LOOPING COMBUSTION OF SOLID BIOMASS - PERFORMANCE OF  
ILMENITE AND BRAUNITE AS OXYGEN CARRIER MATERIALS**

Toni PIKKARAINEN, VTT Technical Research Centre of Finland, Renewable Energy Processes, FINLAND

Co-authors: S. Teir, I. Hiltunen, VTT Technical Research Centre of Finland, Espoo, Finland

ORAL PRESENTATIONS

**TUESDAY, 13 JUNE 2017**

**08:30 - 10:00**

**VISUAL PRESENTATIONS 2BV.1**

**Innovative Methods and Tools for Small and Large Scale Combustion Technologies Modelling. Solid Biofuels Characterisation and Production Systems Assessment**

ROOM: Poster Area

*See page 99*

**10:00 - 10:15**

**BREAK**

**10:15 - 11:00**

**PLENARY SESSION 1BP.1**

**Biomass Resources Leading Towards Lower Carbon Emissions**

ROOM: K1

**CHAIRPERSON:**

**Berien ELBERSEN**, Alterra, THE NETHERLANDS

**1BP.1.1**

**IMPACT OF WASTE WOOD RECYCLING ON THE EU BIOECONOMY. OVERVIEW ON THE MOST ADOPTED VALUE CHAIN IN EUROPE**

Magdalena BORZECKA-WALKER, Institute of Soil Science and Plant Cultivation, Bioeconomy and System Analysis Dpt., POLAND

Co-author: D.Boulday, Institute of Soil Science and Plant Cultivation, Poland

**1BP.1.2**

**NEGATIVE CARBON EMISSIONS FROM PERENNIAL RHIZOMATOUS GRASSES USED AS BIOMASS CROPS**

Michael JONES, Trinity College Dublin, Botany Dpt., IRELAND

**11:00 - 11:45**

**PLENARY SESSION 2BP.2**

**Biomass Application in Large Power Plants and in Supercritical Gasification**

ROOM: K1

**CHAIRPERSON:**

**Ingwald OBERNBERGER**, Bios Bioenergiesysteme, AUSTRIA

**2BP.2.1**

**UNDERSTANDING BIOMASS IGNITION IN POWER PLANT MILLS**

Lars SCHWARZER, Technical University of Denmark, Chemical and Biochemical Engineering Dpt., DENMARK

Co-authors: P. A. Jensen, P. Glarborg, K. Dam-Johansen, DTU Chemical Engineering Dpt., Kgs Lyngby, Denmark; J. K. Holm, DONG Energy, Fredericia, Denmark

**2BP.2.2**

**SEPARATION OF SALTS DURING THE GASIFICATION OF SPENT GRAIN IN SUPERCRITICAL WATER**

Nikolaos BOUKIS, Karlsruhe Institute of Technology, Institute of Catalysis Research and Technology, GERMANY

Co-authors: I.K. Stoll, J. Sauer, Karlsruhe Institute of Technology, Germany; J. Fischer, R. Kansy, Paulaner, Munich, Germany

**11:45 - 12:30**

**PLENARY SESSION 3BP.3**

**Advances in Biomass Conversion Technologies and Processes**

ROOM: K1

**CHAIRPERSON:**

**David CHIARAMONTI**, University of Florence, RE-CORD, ITALY

**3BP.3.1**

**BIOCONVERSION PROCESSES FOR THE BIO-BASED ECONOMY-DEVELOPMENT OF ENZYMES, ROBUST CELL FACTORIES AND ROBUST PROCESSES**

Lisbeth OLSSON, Chalmers University of Technology, Chemical & Biological Engineering Dpt., SWEDEN

Co-authors: M. Bettiga, C.J. Franzén, Chalmers University of Technology, Gothenburg, Sweden

**3BP.3.2**

**STATUS OF PYROLYSIS AND UPDATE ON THE EMPYRO PYROLYSIS DEMONSTRATION PLANT**

Gerhard MUGGEN, BTG BioLiquids, THE NETHERLANDS

**12:30 - 13:30**

**LUNCH**

**VISIT TO SCANDINAVIAN BIOGAS PLANT:**

**The first industrial food waste based biogas plant in Stockholm County.**

**Tuesday 13th June, at 10:00am\***

Organised by:



\*Space is limited up to 45 people max.

13:30 - 15:00

ORAL SESSION 1BO.5

**Municipal and Industrial Biowaste: Specific Technologies and Case Studies**

ROOM: K21

**CHAIRPERSONS:**

**Samir BINDER**, Fraunhofer-Institut UMSICHT, GERMANY

**Magdalena BORZECKA**, Institute of Soil Science and Plant Cultivation, Pulawy, POLAND

**1BO.5.1**

**RESOURCE EFFICIENCY OF BIOENERGY FROM MUNICIPAL WASTE - A CASE STUDY FROM MUNICIPALITY OF STUTTGART IN SOUTHERN GERMANY**

Gerold HAFNER, University of Stuttgart, ISWA - Institute for Sanitary Engineering, Water Quality and Solid Waste Management Dpt., GERMANY

Co-author: C. Maurer, University of Stuttgart, Germany

**1BO.5.2**

**POWER GENERATION BASED ON AGRICULTURAL RESIDUES GASIFICATION: THE POTENTIAL OF CORN COBS**

Maria GÓMEZ, Universidad de La Sabana, Chemical Engineering Dpt., COLOMBIA

Co-authors: M. Gomez, Universidad de La Sabana, Bogotá, Colombia; L. Martinez, Universidad de La Sabana, Bogotá, Colombia; A. Sanches-Pereira, Universidade de Sao Paulo, Sao Paulo, Brazil; A. Manrique, KTH Royal Institute of Technology, Stockholm, Sweden

**1BO.5.3**

**TECHNO-ECONOMIC OPTIMISATION OF COMBINED ANAEROBIC DIGESTION AND GASIFICATION OF FOOD WASTE AS INTEGRATED WASTE MANAGEMENT AND ENERGY SYSTEM**

Rory MONAGHAN, National University of Ireland Galway, Mechanical Engineering Dpt., IRELAND

Co-authors: A. Singlitico, K. Dussan, J. Goggins, National University of Ireland, Galway, Ireland; R. O'Shea, D. Wall, J. Murphy, University College Cork, Ireland

**1BO.5.4**

**ASSESSMENT OF CITRUS WASTES GASIFICATION THROUGH A FLUIDIZED BED REACTOR: EXPERIMENTAL ANALYSIS FOR INTEGRATION IN AN EXISTING CITRUS JUICE INDUSTRY**

Mauro PRESTIPINO, University of Messina, Engineering Dpt., ITALY

Co-authors: V. Chiodo, G. Zafarana, CNR-ITAE, Messina, Italy; A. Galvagno, University of Messina, Italy

**1BO.5.5**

**INCREASED BIOGAS PRODUCTION FROM SEWAGE SLUDGE AND MANURE WITH HIGHLY EFFICIENT DEWATERING AND PHOSPHATE RECOVERY**

Jaap KIEL, Energy Research Centre of the Netherlands, Biomass & Energy Efficiency Dpt., THE NETHERLANDS

Co-authors: A.J. Grootjes, J.R. Pels, M.C. Carbo, Energy Research Centre of the Netherlands, Petten, The Netherlands; H. Kuipers, Waterschap Zuiderzeeland, Lelystad, The Netherlands; J. Vogelaar, Paques B.V., Balk, The Netherlands



13:30 - 15:00

**ORAL SESSION 2BO.6**

**Research and Development Concerning Aspects of Gasification, Gas Cleaning and CHP**

ROOM: K2

**CHAIRPERSONS:**

**Marco BARATIERI**, Free University of Bolzano, ITALY

**Markus BOLHÀR-NORDENKAMPF**, Valmet, AUSTRIA

**2BO.6.1**

**ASH AND BED MATERIAL RESEARCH IN DUAL FLUIDIZED BED GASIFICATION OF BIOMASS IN LAB- AND INDUSTRIAL-SCALE**

Matthias KUBA, Bioenergy 2020+, AUSTRIA

Co-author: H. Hofbauer, TU Wien, Vienna, Austria

**2BO.6.2**

**GASIFICATION OF ANAEROBIC DIGESTATE FROM MIX OF BIOMASS RESIDUES, MANURES AND MSW TO COMBINED HEAT AND POWER PRODUCTION**

Donatella BARISANO, ENEA Research Centre, Energy Technologies Dpt., ITALY

Co-authors: F. Nanna, A. Villone, R. Agostini, C. Freda, G. Cornacchia, ENEA Research Centre, Rotondella, Italy; S. Brandani, Ladurner Srl, Bolzano, Italy

**2BO.6.3**

**SEWAGE SLUDGE PYROLYSIS IN AN INDIRECTLY HEATED ROTARY KILN: PRIMARY MEASURES FOR TAR REDUCTION.**

Sonia L. RINCON PRAT, National University of Colombia, Mechanical and Mechatronics Engineering Dpt., COLOMBIA

Co-authors: L. Mendoza Geney, A. Gomez, S. Rincon, Universidad Nacional de Colombia, Bogotá, Colombia

**2BO.6.4**

**THE ROLE OF INORGANICS IN MODELLING OF BIOMASS GASIFICATION**

Jukka KONTTINEN, Tampere University of Technology, Chemistry and Bioengineering Dpt., FINLAND

Co-authors: J. Krumb, Tampere University of Technology, Tampere, Finland; N. DeMartini, Åbo Akademi Process Chemistry Centre, Turku, Finland; A. Gomez-Barea, University of Seville, Spain

**2BO.6.5**

**KINETIC STUDY OF SUPERCRITICAL WATER GASIFICATION IN THE MIXTURE OF GLUCOSE, XYLOSE, AND GUAIACOL**

Nattacha PAKSUNG, Hiroshima University, Mechanical Sciences and Engineering Dpt., JAPAN

Co-author: Y. Matsumura, Hiroshima University, Higashi-Hiroshima, Japan

## ORAL PRESENTATIONS

### TUESDAY, 13 JUNE 2017

13:30 - 15:00

#### ORAL SESSION 3BO.7

##### Biorefinery Concepts

ROOM: K1

#### CHAIRPERSONS:

**Gerfried JUNGMEIER**, Joanneum Research Forschungsgesellschaft, AUSTRIA

**Pavlina NANOU**, Energy Research Centre of the Netherlands, THE NETHERLANDS

#### 3BO.7.1

##### TECHNOLOGICAL ADVANCES AND OPPORTUNITIES FOR THE DEVELOPMENT OF SUSTAINABLE BIOREFINERIES

Solange MUSSATTO, Technical University of Denmark, Novo Nordisk Foundation Center for Biosustainability, DENMARK

#### 3BO.7.2

##### TECHNO-ECONOMIC EVALUATION OF A SMALL SCALE INTEGRATED BIOREFINERY BASED ON OLIVE TREE PRUNING BIOMASS

Ana Isabel SUSMOZAS, CIEMAT, Energy Dpt., SPAIN

Co-authors: I. Ballesteros, M.J. Negro, J.M. Oliva, M. Ballesteros, CIEMAT, Madrid, Spain

#### 3BO.7.3

##### SMIBIO: A GERMAN BUSINESS CASE STUDY

Ingo BALL, WIP, Project Dpt., GERMANY

Co-authors: R. Janssen, D. Rutz, WIP, Munich, Germany

#### 3BO.7.4

##### BLACK RICE STRAW AS A FEEDSTOCK FOR THE EXTRACTION OF ANTHOCYANIN AND SUGARS IN A COMBINED BIOREFINERY

Kamaljit MOIRANGTHEM, University of Nottingham, Biosciences Dpt., UNITED KINGDOM

Co-authors: P. Ramakrishna, A. Ghumra, G. Tucker, University of Nottingham, Loughborough, United Kingdom; R. Rajkumari, D.M. College of Science, Imphal, India

#### 3BO.7.5

##### MACROALGAE BIOREFINERY IN A NORDIC PERSPECTIVE

Anne-Belinda BJERRE, Danish Technological Institute, Biomass and Biorefinery Dpt., DENMARK

Co-authors: X. Hou, R. Neerup, D.B. Karakashev, Danish Technological Institute, Taastrup, Denmark

13:30 - 15:00

**ORAL SESSION IBO.8**

**Biomass Utilisation Perspectives**

ROOM: K23+K24

**CHAIRPERSONS:**

**Kees KWANT**, Netherlands Enterprise Agency, Ministry of Economic Affairs, THE NETHERLANDS

**Nathalie DEVRIENDT**, VITO - Flemish Institute Technological Research, BELGIUM

**IBO.8.1**

**PROMOTING A NEW EUROPEAN STRATEGY FOR ORGANIC WASTE VALORISATION INTO HIGH VALUE BIO-SYNGAS AS A NEW DIRECTION TOWARDS THE EUROPEAN BIOFUELS SECTOR DEVELOPMENT**

Giuliano GRASSI, Secretary General, European Biomass Industry Association, BELGIUM  
Co-authors: L. Tita, EUBIA, Bruxelles, Belgium

**IBO.8.2**

**FROM GREEN FOREST TO GREEN COMMODITY CHEMICALS**

Jonas JOELSSON, SP Processum, SWEDEN

Co-authors: M. Warneryd, SP Technical Research Institute of Sweden, Gothenburg, Sweden; Y. Alwarsdotter, SEKAB, Örnsköldsvik, Sweden; J. Brücher, Holmen, Örnsköldsvik, Sweden; L. Heuts, West Sweden Chemicals and Materials Cluster, Gothenburg, Sweden

**IBO.8.3**

**SUSTAINABLE REGIONAL SUPPLY CHAINS FOR WOODY BIOENERGY IN EASTERN EUROPE**

Frank MISCHLER, GIZ- German Development Cooperation, GERMANY

**IBO.8.4**

**ASH REMOVAL FROM ASH-RICH BIOMASS AND SLUDGE: THE BIAR PROCESS**

Gian Claudio FAUSSONE, Inser Energia, ITALY

Co-authors: M. Grilc, B. Likozar, National Institute of Chemistry, Ljubljana, Slovenia Republic

**IBO.8.5**

**BIOENERGY IN BALANCING GRIDS AND PROVIDING STORAGE OPTIONS - RESULTS OF IEA BIOENERGY AGREEMENT SPECIAL PROJECT**

Antti ARASTO, VTT Technical Research Centre of Finland, FINLAND

Co-authors: D. Chiamonti, University of Florence, Italy; J. Kiviluoma, K. Sipilä, VTT Technical Research Centre of Finland, Espoo, Finland; E. van den Heuvel, studio Gear Up, Amsterdam, The Netherlands; L. Waldheim, Waldheim Consulting, Stockholm, Sweden; K. Maniatis, European Commission DG ENER, Brussels, Belgium

## ORAL PRESENTATIONS

### TUESDAY, 13 JUNE 2017

13:30 - 15:00

#### VISUAL PRESENTATIONS 5BV.2

##### Integration of Bioenergy with other Renewable and Conventional Energy Sources

ROOM: Poster Area

See page 104

13:30 - 17:00

#### WORKSHOP

##### Wood Stoves 2020 - Towards high efficiency and low emissions

See page 149

15:00 - 15:15

BREAK

15:15 - 16:45

#### ORAL SESSION 4BO.9

##### From Research to Implementation in an International Context

ROOM: K21

#### CHAIRPERSONS:

**Giuliano GRASSI**, Secretary General, European Biomass Industry Association, BELGIUM

**Maurizio COCCHI**, ETA-Florence Renewable Energies, ITALY

#### 4BO.9.1

##### BIOENERGY SUSTAINING THE FUTURE AND ERA-NET BIOENERGY RESULTS

Kees KWANT, Netherlands Enterprise Agency, Ministry of Economic Affairs, RVO, THE NETHERLANDS

Co-authors: R. van Leeuwen - Jones, RVO.nl, Roermond, The Netherlands; B. de Leeuw, BEIS, London, United Kingdom

#### 4BO.9.2

##### RESOURCE EFFICIENT MARKET STIMULATION POLICIES FOR INDIGENOUS BIOMASS VALUE CHAINS AT EU MEMBER STATES

Calliope PANOUTSOU, Imperial College London, Centre for Energy Policy and Technology, UNITED KINGDOM

Co-authors: A. Singh, Imperial College London, United Kingdom; A. Uslu, J. van Stralen, ECN, Amsterdam, The Netherlands; L. Pelkmans, VITO, Mol, Belgium; B. Elbersen, DLO, Amsterdam, The Netherlands

#### 4BO.9.3

##### FUTURE MARKET SHARE ESTIMATION OF RENEWABLE GAS IN GERMANY USING A SYSTEM DYNAMICS MODELLING APPROACH

Thomas HORSCHIG, DBFZ-German Biomass Research Centre, Bioenergy Systems Dpt., GERMANY

Co-author: D Thrän, DBFZ-German Biomass Research Centre, Leipzig, Germany

**4BO.9.4**

**INTERNATIONAL TRADE OF ENERGY BIOMASS - AN OVERVIEW OF THE GLOBAL STATUS**

Svetlana PROSKURINA, Lappeenranta University of Technology, Laboratory of Sustainable Energy Systems, FINLAND

Co-authors: M. Junginger, Copernicus Institute, Utrecht University, Utrecht, The Netherlands; J. Heinimo, Mikkeli Development Miksei Ltd, Mikkeli, Finland; E. Vakkilainen, Lappeenranta University of Technology, Finland

**4BO.9.5**

**SUPPLY-SIDE PERSPECTIVES ON THE EURO-AMERICAN PELLET TRADE**

William HUBBARD, Southern Regional Extension Forestry, USA

Co-author: D.P. Geller, University of Georgia, Athens, GA, USA

**15:15 - 16:45**

**ORAL SESSION 2BO.10**

**Advances in Gasification for Synthesis Gas Production**

ROOM: K2

**CHAIRPERSONS:**

**Christoph PFEIFER**, University of Natural Resources & Life Sciences, AUSTRIA

**Elmer LEDESMA**, University of St. Thomas, USA

**2BO.10.1**

**EUBCE STUDENT AWARDEE PRESENTATION**

**EXPERIMENTAL INVESTIGATION ON STEAM-OXYGEN FLUIDIZED BED GASIFICATION OF BIOGENIC RESIDUES**

Max SCHMID, University of Stuttgart, Institute of Combustion and Power Plant Technology, GERMANY

Co-authors: M. Beirow, D. Schweitzer, R. Spörl, G. Scheffknecht, IFK University of Stuttgart, Stuttgart, Germany

**2BO.10.2**

**GASIFICATION OF PINE FOREST RESIDUES AS FIRST STAGE FOR THE PRODUCTION OF JET FUEL VIA FISCHER-TROPSCH**

Isabel FONTS, Centro Universitario de la Defensa, Chemical and Environmental Engineering Dpt., SPAIN

Co-authors: J. Abrego, N. Gil-Lalaguna, M. Atienza-Martinez, Z. Afailal, J.A Mateo-Román, Aragon Institute for Engineering Research (I3A), Universidad de Zaragoza, Zaragoza, Spain

**2BO.10.3**

**RECIRCULATION OF REACTIVE FINES. AN OPTIMIZATION STRATEGY FOR EXISTING DUAL FLUIDIZED BED GASIFICATION SYSTEMS**

Sébastien PISSOT, Chalmers University of Technology, Energy Technology Division, SWEDEN

Co-authors: T. Berdugo, M. Seemann, Chalmers University of Technology, Göteborg, Sweden

**2BO.10.4**

**METHANATION-ENHANCED GASIFICATION - DESIGN OF A HIGH PRESSURE GASIFICATION REACTOR TO INVESTIGATE AND BOOST THE BIOMASS TO SNG CONVERSION EFFICIENCY**

Gebhard WAIZMANN, University of Stuttgart IFK, Institute of Combustion and Power Plant Technology, GERMANY

Co-authors: R. Spörl, G. Scheffknecht, IFK - University of Stuttgart, Germany

## ORAL PRESENTATIONS

### TUESDAY, 13 JUNE 2017

#### 2BO.10.5

##### **ALKALI COMPOUNDS AS TAR AND SOOT SUPPRESSORS IN ENTRAINED FLOW GASIFICATION.**

Albert BACH-OLLER, Luleå University of Technology, Division of Energy Science, SWEDEN

Co-authors: G. Haggstrom, K. Kirtania, E. Furusjo, K. Umeki, Division of Energy Science, Lulea University of Technology, Lulea, Sweden

15:15 - 16:45

#### ORAL SESSION 3BO.11

##### **Liquefaction Processes, Kinetics and Products**

ROOM: K1

#### CHAIRPERSONS:

**Wim VAN SWAAIJ**, University of Twente, THE NETHERLANDS

**Ursel HORNUNG**, Karlsruhe Institute of Technology, GERMANY

#### 3BO.11.1

##### **MICROWAVE PYROLYSIS OF BIOMASS: TURNING THE FUNDAMENTALS INTO COMMERCIAL PLANTS**

Daniel BENEROSO VALLEJO, University of Nottingham, Chemical and Environmental Engineering Dpt., UNITED KINGDOM

Co-authors: J. Robinson, The University of Nottingham, Nottingham, United Kingdom

#### 3BO.11.2

##### **HYDROTHERMAL PROCESSING OF WASTEWATER WILLOW WITH INTEGRATED NUTRIENTS RECOVERY**

Federica CONTI, Aalborg University, Energy Technology Dpt., DENMARK

Co-authors: T.H. Pedersen, L. Rosendahl, Aalborg University, Aalborg, Denmark; H.L. Bach, Ny Vraa Bioenergy, Tylstrup, Denmark

#### 3BO.11.3

##### **NEW PSEUDO-COMPONENTS OF HEMICELLULOSE AND LIGNIN**

Karla DUSSAN, National University of Ireland, Mechanical Engineering Dpt., IRELAND

Co-authors: S. Dooley, Trinity College Dublin, Dublin, Ireland; R. Monaghan, National University of Ireland Galway, Galway, Ireland

#### 3BO.11.4

##### **EFFECT OF BIOMASS PARTICLE SIZE ON THE FAST PYROLYSIS CHARACTERISTICS OF PALM KERNEL SHELL TO PRODUCE THE BIOCRUDE-OIL**

Sang-Kyu CHOI, Korea Institute of Machinery & Materials, Eco-Machinery System Dpt., KOREA

Co-authors: Y.S. Choi, S.J. Kim, S.Y. Han, Y.W. Jeong, Korea Institute of Machinery and Materials, Daejeon, Korea; T. Rahman, Korea University of Science and Technology, Daejeon, Korea

#### 3BO.11.5

##### **BIO-OIL PRODUCTION FROM PALM-OIL INDUSTRY RESIDUES EMPLOYING CONVENTIONAL AND CATALYTIC HYDROTHERMAL LIQUEFACTION**

Jeerattikul KAHARN, Kasetsart University, Mechanical Engineering Dpt., THAILAND

Co-authors: A. Suemanotham, Thailand Institute of Scientific and Technological Research, Pathum Thani, Thailand; K. Somkeattikul, T. Thuechart, M. Haruthaithanasan, C. Areeprasert, Kasetsart University, Bangkok, Thailand

15:15 - 16:45

**ORAL SESSION IBO.12**

**Commercialization of Bioenergy and Biorefinery Concepts**

ROOM: K23+K24

**CHAIRPERSON:**

**Stefan RUYTERS**, Ghent Bio-Economy Valley, BELGIUM

**IBO.12.1**

**POWER2GAS PLANT OPERATION SCHEMES - FIRST RESULTS FROM GP  
JOULE'S POWER GAP FILLER**

Lars JÜRGENSEN, Aalborg University Esbjerg, Energy Technology Dpt., DENMARK

**IBO.12.2**

**OPTIMISED LOW-CAPEX CONCEPT FOR THE PRODUCTION OF DROP-IN  
BIOFUELS VIA GASIFICATION**

Ilkka HANNULA, VTT Technical Research Centre of Finland, FINLAND

Co-author: E. Kurkela, VTT Technical Research Centre of Finland, Espoo, Finland

**IBO.12.3**

**CELLUAPP - TECHNOLOGY ENABLING WOOD BASED VALUE CHAINS**

Thore LINDGREN, SEKAB E-Technology, SWEDEN

Co-author: J. Lindstedt, SEKAB E-Technology, Örnsköldsvik, Sweden

**IBO.12.4**

**CAN BIOMASS PLAY A ROLE IN REDUCING GREENHOUSE GAS EMISSIONS  
FROM CANADA'S OIL SANDS?**

Jamie STEPHEN, TorchLight Bioresources, CANADA

Co-authors: W.E. Mabee, Queen's University, Kingston, Canada; J. Bergerson, University of Calgary, Canada; H.L. MacLean, University of Toronto, Canada

**IBO.12.5**

**A NOVEL ROBUST AND SELECTIVE SOLVENT FOR BIOMASS FRACTIONATION**

Igor BABICH, BIOeCON, THE NETHERLANDS

Co-authors: J. Moulijn, P. O'Connor, BIOeCON, Hoewelaken, The Netherlands

15:15 - 16:45

**VISUAL PRESENTATIONS 3BV.3**

**Biomass to Biobased Products and Bioenergy**

ROOM: Poster Area

*See page 106*

15:15 - 17:40

**WORKSHOP**

**Round Table on Bioenergy for Sustainable Development**

*See page 151*

## ORAL PRESENTATIONS

### TUESDAY, 13 JUNE 2017

**15:15 - 18:30**

#### **WORKSHOP**

**Overview of the JRC Biomass assessment study**

*See page 152*

**16:45 - 17:00**

**BREAK**

**17:00 - 18:30**

#### **ORAL SESSION 4BO.13**

**Sustainability for Biomass Systems**

ROOM: K21

#### **CHAIRPERSONS:**

**Alexa LUTZENBERGER**, ALRENE, GERMANY

**Katja OEHMICHEN**, DBFZ-German Biomass Research Centre, GERMANY

#### **4BO.13.1**

#### **BIOECONOMY WITH ALGAE - LIFE CYCLE SUSTAINABILITY ASSESSMENT INCLUDING BIOPHYSICAL CLIMATE IMPACTS (ALBEDO) OF AN ALGAE-BASED BIOREFINERY**

Maria HINGSAMER, Joanneum Research Forschungsgesellschaft, AUSTRIA

Co-authors: N. Bird, I. Kaltenecker, G. Jungmeier, Joanneum Research Forschungsgesellschaft, Graz, Austria; D. Kleinegris, Wageningen UR - Food & Biobased Research, Wageningen, The Netherlands; P. Lamers, Wageningen University, The Netherlands; S. Boussiba, Ben-Gurion University of the Negev, Beer Sheva, Israel; L. Rodolfi, Fotosintetica & Microbiologica S.r.l, Florence, Italy; N.H. Norsker, Biotopic, Huelva, Spain; F. Jacobs, Evodos B.V., Raamsdonksveer, The Netherlands; M. Fenton, Cellulac, Chesterford, United Kingdom; R. Ranjbar, FeyeCon Development and Implementation B.V., Amsterdam, The Netherlands; M. Hujanen, Neste Oil Corporation, Helsinki, Finland; M. Sanz, IDconsortium SL, Madrid, Spain

#### **4BO.13.2**

#### **CLEANAIR BY BIOMASS - STATUS QUO ANALYSIS OF THE MODEL REGION**

Christoph SCHMIDL, Bioenergy 2020+, Biomass Combustion Dpt., AUSTRIA

Co-authors: F. Klauer, R. Sturmlechner, M. Schwabl, G. Reichert, A. Weissinger, H. Stressler, W. Haslinger, Bioenergy 2020+, Graz, Austria

#### **4BO.13.3**

#### **THE GLOBAL BIOENERGY PARTNERSHIP AND ITS SUSTAINABILITY INDICATORS**

Marco COLANGELI, GBEP - FAO, Climate and Environment Dpt., ITALY

Co-authors: A. Rossi, M. Morese, Food and Agriculture Organization of the United Nations, Rome, Italy

#### **4BO.13.4**

#### **STRENGTHENING THE FOOD SECURITY PROVISIONS IN BIOFUEL SUSTAINABILITY CERTIFICATION SYSTEMS**

Stephen THORNHILL, University College Cork, Food Business and Development Dpt., IRELAND



**4BO.13.5**

**COMPARATIVE SOCIO-ECONOMIC INDICATORS FOR SUSTANABLE LIGNOCELLULOSIC BIOMASS IN BRAZIL AND THE SOUTHEAST OF THE USA**

Rocio DIAZ-CHAVEZ, Imperial College London, Centre for Environmental Policy, UNITED KINGDOM

Co-authors: A. Walter, Universidade Estadual de Campinas, Campinas, Brazil; P. Gerber, Universidade de Campinas, Camoinas, Brazil

**17:00 - 18:30**

**ORAL SESSION 2BO.14**

**Advances in Gas Cleaning and Tar Removal from Gasification Gas for Synthesis Gas Production**

ROOM: K2

**CHAIRPERSONS:**

**Nikolaos BOUKIS**, Karlsruhe Institute of Technology, GERMANY

**Donatella Barisano**, ENEA, Rotondella, Italy

**2BO.14.1**

**TAR CRACKING OVER OLIVINE AND SAND IN A CELLULAR FLUIDIZED BED REACTOR**

Mathieu MORIN, INP Laboratoire de Genie Chimique, FRANCE

Co-authors: X. Nitsch, S. Pecate, M. Hemati, Laboratoire de Genie Chimique, Toulouse, France

**2BO.14.2**

**TAR REMOVAL FROM BIOMASS PRODUCER GAS BY USING BIOCHAR**

Giulia RAVENNI, Technical University of Denmark, Chemical Engineering Dpt., DENMARK

Co-authors: J. Ahrenfeldt, U.B. Henriksen, Z. Sárossy, Technical University of Denmark, Roskilde, Denmark

**2BO.14.3**

**BIOMASS GASIFICATION AND BIOSNG PRODUCTION: USE OF SORBENTS FOR SIMULTANEOUS H<sub>2</sub> ENRICHMENT AND CO<sub>2</sub> REMOVAL FOR THE CONDITIONING OF GAS COMPOSITION**

Giacobbe BRACCIO, ENEA Research Centre, Solar Testing Laboratory and Biomass Section, ITALY

Co-authors: D. Barisano, R. Agostini, A. Villone, F. Nanna, ENEA Research Centre, Rotondella, Italy; K. Gallucci, P.U. Foscolo, University of L'Aquila, Italy

**2BO.14.4**

**REACTIVE TEST GAS GENERATION COMBINED WITH ON-LINE TAR-MONITORING AND COMPARISON WITH OFF-LINE LIQUID SAMPLES ANALYSIS**

York NEUBAUER, TU Berlin, Institute of Energy Engineering, GERMANY

Co-authors: A. Gredinger, University of Stuttgart, Germany; J. Borgmeyer, TU Berlin, Germany; M. Kleinhappl, Weiz, Austria; R. Farias Fujita, S.M.A. Biollaz, PSI, Villigen, Switzerland

## ORAL PRESENTATIONS

### TUESDAY, 13 JUNE 2017

#### 2BO.14.5

##### **CHAR CONVERSION CHARACTERIZED BY X-RAY TOMOGRAPHY AND SEM-EDS ANALYSIS**

Anna STRANDBERG, University of Umea, Applied Physics and Electronics Dpt., SWEDEN

Co-authors: M. Thyrel, R. Backman, N. Skoglund, M. Brostrom, Umea University, Umea, Sweden; M. Rudolfsson, T.A. Lestander, Swedish University of Agricultural Sciences, Umea, Sweden

17:00 - 18:30

#### ORAL SESSION 3BO.15

##### **Fundamental Investigation of Liquefaction Processes**

ROOM: K1

#### CHAIRPERSONS:

**Paul DE WILD**, Energy Research Centre of the Netherlands, THE NETHERLANDS

**Patrick BILLER**, Aarhus University, DENMARK

#### 3BO.15.1

##### **FERMENTATION OF BIO-OIL DERIVED FROM MICROWAVE PYROLYSIS**

Emily KOSTAS, University of Nottingham, Microwave Process Engineering Research Group, UNITED KINGDOM

Co-authors: B. Shepherd, J. Robinson, University of Nottingham, United Kingdom

#### 3BO.15.2

##### **CONSTANT VOLUME PYROLYSIS OF BIOMASS FOR THE PRODUCTION OF CHAR WITH HIGH FIXED-CARBON CONTENT.**

Maider LEGARRA ARIZALETA, Hawaii Natural Energy Institute, USA

Co-authors: S. Van Wesenbeeck, S. Turn, T. Morgan, M. Antal, Hawaii Natural Energy Institute, Honolulu, USA; O. Skreiberg, L. Wang, SINTEF Energy Research, Trondheim, Norway; G. Grønli, Norwegian University of Science and Technology, Trondheim, Norway

#### 3BO.15.3

##### **THE CHALLENGE OF LIGNIN AS A CHEMICAL RESOURCE**

Julia SCHULER, Karlsruhe Institute of Technology, Institute of Catalysis Research and Technology, GERMANY

Co-authors: U. Hornung, J. Sauer, Karlsruhe Institute of Technology, Germany

#### 3BO.15.4

##### **UNDERSTANDING OF RELATIONSHIP BETWEEN LIGNIN STRUCTURE AND DEPOLYMERIZATION BEHAVIORS IN SUPERCRITICAL ETHANOL AND FORMIC ACID MIXTURE**

Jaeyong PARK, Sungkyunkwan University, Mechanical Engineering Dpt., KOREA

Co-authors: A. Riaz, J. Kim, Sungkyunkwan University, Suwon, Korea

#### 3BO.15.5

##### **EXPANDING THE FEEDSTOCK BASE FOR THERMOCHEMICAL BIOMASS CONVERSION**

Daniel CARPENTER, National Renewable Energy Laboratory, National Bioenergy Center, USA

Co-authors: T. Westover, INL, Idaho Falls, USA; D. Howe, PNNL, Richland, USA; S. Deutch, National Renewable Energy Laboratory, Golden, USA

17:00 - 18:30

**ORAL SESSION IBO.16**

**Large Scale Industrial Application for Heat and Power**

ROOM: K23+K24

**CHAIRPERSONS:**

**Yves RYCKMANS**, Laborelec, BELGIUM

**Jaap KOPPEJAN**, Procede Biomass, THE NETHERLANDS

**IBO.16.1**

**GLOBAL WOOD PELLET INDUSTRY AND MARKET - CURRENT DEVELOPMENTS AND OUTLOOK**

Daniela THRÅN, DBFZ-German Biomass Research Centre, Bioenergy Systems Dpt., GERMANY

Co-author: D. Peetz, DBFZ-German Biomass Research Centre, Leipzig, Germany

**IBO.16.2**

**CO-FIRING TESTS OF SUGAR CANE HARVESTING RESIDUES (RAC) WITH COAL AND PITH IN A LARGE-SCALE BOILER.**

Julian LUCUARA, Cenicana, COLOMBIA

Co-authors: J. Lucuara Medina, A. Gomez, N. Gil Zapata, Cenicaña, Cali, Colombia; J. Castillo, J.

Paredes, Ingenio La Cabaña, Cali, Colombia; J. Molina, Carvajal Pulpa Y Papel, Cali, Colombia

**IBO.16.3**

**FACING SAFETY ISSUES IN HANDLING AND STORAGE OF BIOMASS PELLETS IN LARGE SCALE**

Jan HINNERSKOV JENSEN, Danish Technological Institute, DENMARK

Co-authors: J. Nyborg, M.G. Jespersen, Danish Technological Institute, Aarhus, Denmark; J.K. Holm, DONG Energy, Gentofte, Denmark

**IBO.16.4**

**HYDROCHAR POTENTIAL APPLICATION IN EUROPEAN STEEL INDUSTRY**

Chuan WANG, Swerea MEFOS, SWEDEN

Co-authors: A. Salimbeni, Ingelia, Valencia, Spain; G. Wang, Ingelia/University of Science and Technology, Beijing, P.R. China

**IBO.16.5**

**LARGE SCALE UTILITY CFB TECHNOLOGY IN WORLDS LARGEST GREENFIELD 100% BIOMASS POWER PLANT**

Teemu NEVALAINEN, Foster Wheeler Energia, Global Technology Dpt., FINLAND

Co-authors: C. Moqvist, Amec Foster Wheeler Energi, Norrköping, Sweden; T. Eriksson, Amec Foster Wheeler Energia, Espoo, Finland; K. Nuortimo, Amec Foster Wheeler Energi, Varkaus, Finland; M. Nikkilä, Amec Foster Wheeler Energia, Varkaus, Finland

17:00 - 18:30

**VISUAL PRESENTATIONS 3BV.4**

**Advances on Biomass Conversion and Application in Different Sectors**

ROOM: Poster Area

*See page 110*