

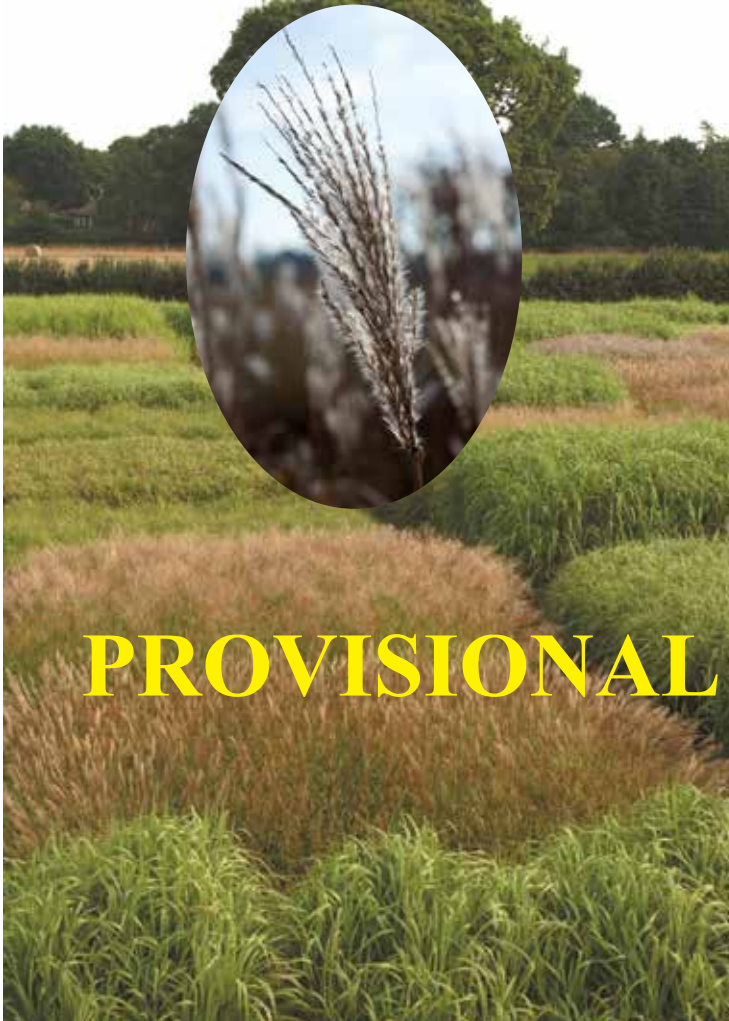


President: Professor Bill Davies

Biomass and Energy Crops V

The Bedford Hotel, Brussels, Belgium

20 - 22 October 2015



PROVISIONAL PROGRAMME



Biomass and Energy Crops V

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Identifying the most appropriate uses of biomass to ensure delivery of the greatest benefit is a key objective of current research. This requires evaluation of biomass and energy crops, conversion technologies, use of by-products and the development of integrated management systems. This research complements efforts to ensure biomass products remain competitive in a volatile market.

As attention increasingly shifts towards deployment of biomass in Europe, this conference provides a timely opportunity to exchange ideas and foster closer collaboration and mutual understanding to identify how we can most effectively use biomass as one means of reducing dependence on fossil fuels. The conference provides an ideal forum for stakeholders to meet and discuss future research.

The conference is being scheduled to coincide with the conclusion of two EU funded Framework 7 projects. Rokwood (<http://www.rokwood.eu>) is focused on the future policy framework, R&D projects and international co-operation for short rotation woody crops. LogistEC (www.logistecproject.eu) aims to develop new or improved logistics and supply chain technologies. In addition, the conference is being co-sponsored by SUPERGEN Bioenergy Hub (www.supergen-bioenergy.net) which brings together industry, academia and other stakeholders to increase sustainable bioenergy deployment in the UK.

PROVISIONAL PROGRAMME

(BASIS Points have been applied for)

TUESDAY 20 OCTOBER 2015

09:00 CONFERENCE REGISTRATION

10:00 COFFEE

10:30 WELCOME & INTRODUCTION

KEVIN LINDEGAARD (Crops for Energy Ltd, Bristol UK)

Session 1: Production

CHAIR: ANGELA KARP (Rothamsted Research, Hertfordshire, UK)

10:40 *Keynote Speaker*

The SCOPE Bioenergy Sustainability Volume

GLAUCIA MENDES SOUZA (University of São Paulo, Butantã, Brazil)

11:25 *Invited Speaker*

Development and current status of willow biomass crops in the U.S.

TIM VOLK (University in Syracuse, New York, USA)

11:55 **Feasibility of willow biomass production in Kastamonu region, Turkey**

RENATO S PACALDO (Mindanao State University, Marawi City, Philippines), MIRAÇ AYDIN & AHMET SIVACIOĞLU (Kastamonu University, Kastamonu, Turkey)

12:15 **Reed biomass as an energy source in the Vojvodina region (north Serbia)**

TAMARA VAŽIĆ, ZORICA SVIRČEV, TAMARA DULIĆ, KOSTA KRSTIĆ & IGOR OBREHT (University of NoviSad, Novi Sad, Serbia)

12:35 **DISCUSSION**

12:45 **LUNCH**

Session 1 (contd): Production

CHAIR: ANGELA KARP (Rothamsted Research, Hertfordshire, UK)

13:45 **Invited Speaker**

TBC

REBECCA HEATON (Drax Power Station, North Yorkshire, UK)

14:15 **Comparative productivity of maize, switchgrass, *Miscanthus*, poplar, prairie, and other cellulosic bioenergy crops in the North Central US**

GREGG R SANFORD, LAWRENCE G OATES (University of Wisconsin–Madison, Madison, USA), POONAM JASROTIA, KURT D THELEN, G. PHILIP ROBERTSON (Michigan State University, Michigan, USA) & RANDALL D JACKSON (University of Wisconsin–Madison, Madison, USA)

14:35 **Crop rotations as basic element of sustainable energy cropping – Integrative evaluation of their agronomic, ecologic, economic and resource efficiency effects**

JENS ECKNER (Thuringian Regional Institute for Agriculture, Jena, Germany), MICHAEL GLEMNITZ (Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg, Germany), JOACHIM AURBACHER (Justus Liebig University Giessen, Giessen, Germany) & MONIKA HEIERMANN (Leibniz Institute for Agricultural Engineering Potsdam-Bornim, Potsdam, Germany)

14:55 **Does mechanical damage at harvest effect the future growth and yield of SRC willow?**

NICOLA YATES, IAN SHIELD and TIM BARRACLOUGH (Rothamsted Research, Hertfordshire, UK)

15:15 **DISCUSSION**

15:30 **TEA**

Session 2: Supply chains

CHAIR: IAN SHIELD (Rothamsted Research, Hertfordshire, UK)

16:00 **Invited Speaker**

Rokwood: Fuelling dialogue between biomass research, industry, policy and business

KEVIN LINDEGAARD (Crops for Energy Ltd, Bristol, UK), MARTIN HOLLEY, ANNETTE LAMLEY (Centre for Sustainable Energy, Bristol, UK), PILAR ZAPATA ARANDA (Bioazul S.L., Málaga, Spain), SAMIR SAYADI, CARLOS PARRA-LÓPEZ, VICTOR HUGO DURAN ZUAZO (Andalusian Institute of Agricultural and Fisheries Research and Training, Seville, Spain), TERESA JANIK, JAROSŁAW GOPEK, MAGDALENA KINER (EKSPERT-SITR Spółka z o.o., Koszalin, Poland), PATRICK DALY (Dublin Institute of Technology, Dublin, Ireland), HANS-GEORG VON ENGELBRECHTEN (Agraligna GmbH, Beuchte, Germany), ANNIKA HENRIKSSON (SalixEnergi Europa AB, Svalöv, Sweden) & CHRISTOPH KNAUER (ttz Bremerhaven, Bremerhaven, Germany)

16:30 **Rokwood: Developing of direct chipping harvesters for SRP by the Swedish family enterprise Henriksson Salix AB**

ANNIKA HENRIKSSON (SalixEnergi Europa AB, Svalöv, Sweden)

16:50 **SRC as raw material for medium scale distinct heating**

HANS-GEORG VON ENGELBRECHEN (Agraligna GmbH, Beuchte, Germany)

17:10 **DISCUSSION**

17:20 **POSTERS (with wine reception)**

Dual purpose wheat: for a future that demands more food and energy

KAMALJIT MOIRANGTHEM, PAUL WALDRON, GREGORY TUCKER, IAN KING & JULIE KING
(School of Biosciences, University of Nottingham, Nottingham, UK)

A Comparative Analysis of Pre-treatment Technologies for the Bioconversion of Willow, *Miscanthus* and Hemp

EMMA SMULLEN, DAVID DOWLING (EnviroCore, Department of Science and Health, Co. Carlow, Ireland), JOHN FINNAN (Teagasc, Crop Research Centre, Co. Carlow, Ireland) & PATRICIA MULCAHY (EnviroCore, Department of Science and Health, Co. Carlow, Ireland)

Efficiency of Biomass Production and Carbon Sequestration of *Acacia mangium*, *Gmelina arborea*, and *Endospermum peltatum* Forest Stands in Philippines

RENATO S PACALDO (Mindanao State University, Marawi City, Philippines)

Destruction phase of perennial rhizomatous grasses: response of giant reed (*Arundo donax* L.) and miscanthus (*Miscanthus* × *giganteus* Greef et Deu.) to mechanical and chemical strategies

NICOLETTA NASSI O DI NASSO, FEDERICO TRIANA, SIMONA BOSCO, CRISTIANO TOZZINI (Institute of Life Sciences Scuola Superiore Sant'Anna di Pisa, Pisa, Italy), ENRICO BONARI (Institute of Life Sciences Scuola Superiore Sant'Anna di Pisa, Pisa, Italy; CRIBE - Centro di Ricerche Interuniversitario Biomasse da Energia, Pisa, Italy) & GIORGIO RAGAGLINI (Institute of Life Sciences Scuola Superiore Sant'Anna di Pisa, Pisa, Italy)

Survival of seeds from wild-flowering mixtures in the biogas process

JULIANE HAHN, PAULA R WESTERMAN, MONIKA HEIERMANN & BÄRBEL GEROWITT (University of Rostock, Rostock, Germany)

Storage/drying of willow-effect on the slagging and deposit tendency during combustion

SUSANNE PAULRUD (SP Technical Research Institute of Sweden, Borås, Sweden) & MARCUS ÖHMAN (Luleå University of Technology, Luleå, Sweden)

Ready-made fuel mix of straw, wood chips and additive, from the terminal to the CHP-plant

SUSANNE PAULRUD, ANDERS HJÖRNHEDE (SP Technical Research Institute of Sweden, Borås, Sweden) and MARCUS ÖHMAN (Luleå University of Technology, Luleå, Sweden)

Field Performance of Eucalyptus Stands for Bioenergy in Southern Spain

C R RODRÍGUEZ PLEGUEZUELO (IFAPA Institute of Agricultural and Fisheries Research and Training, Seville, Spain; Université Catholique de Louvain, Louvain-la-Neuve, Belgium), V H DURÁN ZUAZO, F PEREA TORRES, J A JIMÉNEZ BOCANEGRA (IFAPA Institute of Agricultural and Fisheries Research and Training, Seville, Spain) & CARLOS PARRA LÓPEZ (IFAPA Centro "Camino de Purchil", Granada, Spain)

Short Rotation Coppice in Europe: A regional comparison

PATRICK DALY (Dublin Institute of Technology, Dublin, Ireland)

Estimation of moisture content in poplar

HENRIK KOFOED NIELSEN (University of Agder, Grimstad, Norway)

Lab testing and modelling to understand germination and field establishment of bioenergy crop *Miscanthus*

DANNY CARROLL, CHRIS ASHMAN (Aberystwyth University, Aberystwyth, UK), MICHAL MOS (Terravesta Ltd, Lincolnshire, UK), JOHN CLIFTON-BROWN & PAUL ROBSON (Aberystwyth University, Aberystwyth, UK)

Impact of different salt concentrations on growth, physiology and combustion properties in the dedicated biomass crop *Miscanthus* × *giganteus*

E STAVRIDOU, R WEBSTER & P R H ROBSON (Aberystwyth University, Aberystwyth, UK)

Improving early growth in *Miscanthus × giganteus* crops by the application of plastic mulch film

JOHN O'LOUGHLIN (University College Dublin, Dublin, Ireland; Teagasc CELUP, Carlow, Ireland), JOHN FINNAN (Teagasc CELUP, Carlow, Ireland) & KEVIN McDONNELL (University College Dublin, Dublin, Ireland)

Recycling of liquid residues from the wet torrefaction of biomass for fertigation: evaluation of their effect on giant reed (*Arundo donax* L.) growth and on soil and leached water properties

GIORGIO RAGAGLINI (Institute of Life Sciences, Scuola Superiore Sant'Anna di Pisa, Pisa, Italy), RAIMO VAN DER LINDEN (Energy research Centre (ECN), Petten, The Netherlands), FEDERICO TRIANA, NICOLETTA NASSI O DI NASSO, CRISTIANO TOZZINI, FABIO TACCINI (Institute of Life Sciences, Scuola Superiore Sant'Anna di Pisa, Pisa, Italy) & ENRICO BONARI (Institute of Life Sciences, Scuola Superiore Sant'Anna di Pisa, Pisa, Italy; CRIBE Centro di Ricerche Interuniversitario Biomasse da Energia, Pisa, Italy)

Optimizing the harvesting of *Miscanthus × giganteus*: the effect of harvest time and system on biomass cost

GIORGIO RAGAGLINI (Institute of Life Sciences, Scuola Superiore Sant'Anna, Pisa, Italy), AURELIE PERRIN (INRA - AgroParisTech, Thiverval-Grignon, France), RICARDO VILLANI (Institute of Life Sciences, Scuola Superiore Sant'Anna, Pisa, Italy), CRISTIANO TOZZINI (Institute of Life Sciences, Scuola Superiore Sant'Anna, Pisa, Italy; CRIBE Centro di Ricerche Interuniversitario Biomasse da Energia, Pisa, Italy) & BENOIT GABRIELLE (INRA - AgroParisTech, Thiverval-Grignon, France)

Energy crop yields: a database to compare the productivity of different species

ANABELLE LAURENT, ELISE PELZER (INRA, UMR 211 Agronomie, Thiverval-Grignon, France; AgroParisTech, UMR 211 Agronomie, Thiverval-Grignon, France), CHANTAL LOYCE (AgroParisTech, UMR 211 Agronomie, Thiverval-Grignon, France; INRA, UMR 211 Agronomie, Thiverval-Grignon, France;) & DAVID MAKOWSKI (INRA, UMR 211 Agronomie, Thiverval-Grignon, France; AgroParisTech, UMR 211 Agronomie, Thiverval-Grignon, France)

Screening *Salix* spp. genotypes (willow) for their potential to bioremediate landfill leachate

SIAN FARRAR, ALISTAIR R MCCRACKEN (Agri-Food & Biosciences Institute, Belfast, Northern Ireland, UK) & CHRISTOPHER JOHNSTON (Agri-Food & Biosciences Institute, Co. Down, Northern Ireland, UK)

Biomass production – investigating the effect of nitrogen nutrition on short rotation coppice willow yield

LINDA R E WALSH (Agri-Food & Biosciences Institute, Co Armagh, Northern Ireland, UK), CHRISTOPHER JOHNSTON (Agri-Food & Biosciences Institute, Co. Down, Northern Ireland, UK) & ALISTAIR R MCCRACKEN (Agri-Food & Biosciences Institute, Belfast, Northern Ireland, UK)

Soil water uptake from SRC willow simulated using the process-based model LUCASS

BENJAMIN RICHARD, JENNIFER CUNNIFF (Rothamsted Research, Hertfordshire, UK), MARIANNA CERASUOLO (University of Portsmouth, Hampshire, UK), SALVADOR GIRBAU & GOETZ M RICHTER (Rothamsted Research, Hertfordshire, UK)

Stakeholder perceptions of anaerobic digestion and related land use. A case study from the United Kingdom

MIRJAM RÖDER (University of Manchester, Manchester, UK)

A farm-based assessment of the financial and agronomic potential of *Zea mays* as an energy crop

SAM MYHILL (Moat Farm, Suffolk, UK) & TONY WILSON (Centre for Contemporary Agriculture, Easton and Otley College, Norfolk, UK)

Strategies for weed control in willow crops

ISABELLA DONNELLY (University College Dublin, Dublin, Ireland; Teagasc CELUP, Carlow, Ireland), KEVIN MCDONNELL (University College Dublin, Dublin, Ireland) & JOHN FINNAN (Teagasc CELUP, Carlow, Ireland)

Yield and quality of poplar clones grown as SRC at three sites with different soil types in Denmark

POUL ERIK LÆRKE (Aarhus University, Tjele, Denmark), SØREN UGILT LARSEN (Aarhus University, Tjele, Denmark; AgroTech - Institute for Agri Technology and Food Innovation, Denmark), ANDERS TÆRØ NIELSEN, INGE STUPAK, KARSTEN RAULUND-RASMUSSEN (University of Copenhagen, Frederiksberg, Denmark) and UFFE JØRGENSEN (Aarhus University, Tjele, Denmark)

WEDNESDAY 21 OCTOBER 2015

Session 2 (contd): Supply chains

CHAIR: IAN SHIELD (Rothamsted Research, Hertfordshire, UK)

09:00 *Invited Speaker*

TBC

GUSTAF MELIN (President, The European Biomass Association, Brussels, Belgium; Swedish Bioenergy Association (SVEBIO), Stockholm, Sweden)

09:40 **Harvest technology for short rotation coppices and costs of harvest, transport and storage**

R PECENKA, T HOFFMANN & D EHLERT (Leibniz Institute for Agricultural Engineering Potsdam-Bornim (ATB), Potsdam, Germany)

10:00 **Optimization of biomass supply-chain logistics and sustainability assessment. The case of *Miscanthus* at Burgundy Pellet, France**

AURELIE PERRIN (INRA - AgroParisTech, Thiverval-Grignon, France), JULIE WOHLFAHRT (INRA, SAD – ASTER, Mirecourt, France), TRULS FLATBERG (SINTEF Technology and Society, Trondheim, Norway), FABIANA MORANDI (DTU, Lyngby, Denmark), CRISTINA DE LA RUA LOPEZ (CENER, Navarra, Spain), HANNE ØSTERGÅRD (DTU, Lyngby, Denmark), THOR BJØRKVOLL (SINTEF Technology and Society, Trondheim, Norway) & BENOIT GABRIELLE (INRA - AgroParisTech, Thiverval-Grignon, France)

10:20 **Enhancing the sustainability of anaerobic digestion in Italy: a GIS based investigation for assessing the potential of giant reed in saving land compared with maize**

GIORGIO RAGAGLINI, FEDERICO DRAGONI, ELISA CORNELI, FEDERICO TRIANA, RICARDO VILLANI (Institute of Life Sciences, Scuola Superiore Sant'Anna, Pisa, Italy) & ENRICO BONARI (Institute of Life Sciences, Scuola Superiore Sant'Anna, Pisa, Italy; CRIBE - Centro di Ricerche Interuniversitario Biomasse da Energia, Pisa, Italy)

10:40 **DISCUSSION**

10:50 **COFFEE**

Session 3: Supply

CHAIR: PATRICIA THORNLEY (Tyndall Centre for Climate Change Research, University of Manchester, Manchester, UK)

11:20 *Invited Speaker*

Global supply chains

ADAM BROWN (International Energy Agency, Paris, France)

12:00 **How to improve the performance of biomass supply chains from energy crops in Europe? An overview of the Logist'EC project**

BENOIT GABRIELLE, AURELIE PERRIN (INRA - AgroParisTech, Thiverval-Grignon, France), JULIE WOHLFAHRT (INRA, SAD – ASTER, Mirecourt, France), TRULS FLATBERG, THOR BJØRKVOLL (SINTEF, Trondheim, Norway), INÉS ECHEVARRÍA GONI, DAVID SANCHEZ (CENER, Sarriguren, Navarra, Spain), RAIMO VAN DER LINDEN (Energy Research Centre of The Netherlands (ECN), Petten, The Netherlands), CHANTAL LOYCE, ELISE PELZER (AgroParisTech, INRA, Thiverval-Grignon, France), GIORGIO RAGAGLINI (Scuola Superiore Santa Anna, Pisa, Italy), IAN SHIELD & NICOLA YATES (Rothamsted Research, Hertfordshire, UK)

12:20 **Biomass production – Exploiting Short Rotation Coppice Willow plantation multifunctionality to achieve the joint goals of Biomass production and waste water management**

CHRISTOPHER JOHNSTON (Agri-Food & Biosciences Institute, Co. Down, Northern Ireland, UK), ALISTAIR R MCCracken (Agri-Food & Biosciences Institute, Belfast, Northern Ireland, UK) & LINDA WALSH (Agri-Food & Biosciences Institute, Co. Down, Northern Ireland, UK)

12:40 **Optimizing biomass production systems – exploiting diverse growth traits in different environments**
GOETZ M RICHTER (Rothamsted Research, Harpenden, UK), MARIANNA CERASUOLO (University of Portsmouth, Hampshire, UK) & BENJAMIN RICHARD (Rothamsted Research, Harpenden, UK)

13:00 **DISCUSSION**

13:15 **LUNCH**

Session 4: Utilisation

CHAIR: PATRICIA THORNLEY (Tyndall Centre for Climate Change Research, University of Manchester, Manchester, UK)

14:15 **Invited Speaker**

Bioenergy Value Chains: Whole Systems Analysis and Optimisation

NILAY SHAH (Imperial College London, London)

14:55 **Variation of moisture content and chemical elements for different shoot diameters in a growing willow cultivation**

SUSANNE PAULRUD (SP Technical Research Institute of Sweden, Borås, Sweden) &

JOHANNES ALBERTSSON (Swedish University of Agricultural Sciences, Uppsala, Sweden)

15:20 **Invited Speaker**

Bio-refining and the Organosolv process

RAIMO VAN DER LINDEN (Energy Research Centre (ECN), Petten, The Netherlands)

16:00 **TEA**

Session 5: Environmental impacts and Life cycle assessment

CHAIR: ROB CARLTON (AAB affiliated, De Pinte, Belgium)

16:30 **An inter-year comparison of greenhouse gas flux and carbon budget from a commercial scale land-use transition from semi-improved grassland to *Miscanthus × giganteus***

J MCCALMONT (Institute of Biological, Environmental and Rural Sciences (IBERS), Aberystwyth University, Wales, UK), N MCNAMARA (Centre for Ecology & Hydrology, Lancaster Environment Centre, Lancaster, UK), I DONNISON, K FARRAR & J CLIFTON-BROWN (Institute of Biological, Environmental and Rural Sciences (IBERS), Aberystwyth University, Wales, UK)

16:50 **Initial soil C controls soil C sequestration under bioenergy crops**

REBECCA L ROWE, AIDAN M KEITH, DAFYDD ELIAS (Centre for Ecology & Hydrology, Lancaster Environment Centre, Lancaster, UK), MARTA DONDINI, PETE SMITH (Institute of Biological and Environmental Sciences, University of Aberdeen, Aberdeen, UK) & NIALL P MCNAMARA (Centre for Ecology & Hydrology, Lancaster Environment Centre, Lancaster, UK)

17:20 **GHG Performance of Biomass Resources for Heat Bioenergy Pathways**

ANDREW WELFLE (University of Manchester, Manchester, UK)

17:40 **How certain are greenhouse gas reductions from bioenergy? Life cycle assessment and uncertainty analysis of a forest residue-to-electricity supply chain**

MIRJAM RÖDER (University of Manchester, Manchester, UK), CARLY WHITTAKER (Rothamsted Research, Hertfordshire, UK) & PATRICIA THORNLEY (University of Manchester, Manchester, UK)

18:00 **DISCUSSION**

18:20 **END**

19:30 **CONFERENCE DINNER**

THURSDAY 22 OCTOBER 2015

Session 6: Policy

CHAIR: KEVIN LINDEGAARD (Crops for Energy Ltd, Bristol UK)

09:00 **Invited Speaker**

TBC

PATRICIA THORNLEY (Tyndall Centre for Climate Change Research, University of Manchester, Manchester, UK)

09:40 **Bioenergy, Food Production and Biodiversity - An Unlikely Alliance?**

PETE MANNING (University of Bern, Bern, Switzerland), MICK HANLEY (Plymouth University, Plymouth, UK) & GAIL TAYLOR (University of Southampton, Southampton, UK)

10:00 **Nesting and brood-rearing opportunities for farmland birds in and around *Miscanthus* and Short Rotation Coppice biomass crops**

HENRIETTA PRINGLE (Imperial College London, Berkshire, UK), RUFUS SAGE (The Game and Wildlife Conservation Trust, Hampshire, UK) & SIMON LEATHER (Harper Adams University, Shropshire, UK)

10:20 **Policy options to promote perennial energy crops: the limitations of the UK Energy Crops Schemes and the role for agent-based modelling in policy design**

REBECCA MAWHOOD, RAPHAEL SLADE & NILAY SHAH (Imperial College London, London, UK)

10:40 **DISCUSSION**

10:55 **COFFEE**

11:25 **Short Rotation Coppice in Europe: A regional comparison**

PATRICK DALY (Dublin Institute of Technology, Dublin, Ireland)

11:45 **Planting multipurpose tree species in community lands for biomass production through women self help groups: lessons from South India**

M SHIVAMURTHY & M G CHANDRAKANTH (University of Agricultural Sciences, Bangalore, India)

12:05 **DISCUSSION**

12:15 **Panel: Production; Supply chains; Supply; Utilisation; Environmental impacts and Life cycle assessment; Policy**

CHAIR: ANGELA KARP (Rothamsted Research, Hertfordshire, UK)

PANEL: REBECCA HEATON (Drax Power Station, North Yorkshire, UK), NAVIN SHARMA (World Agroforestry Centre (ICRAF), New Delhi, India), GLAUCIA MENDES SOUZA (University of São Paulo, Butantã, Brazil), PATRICIA THORNLEY (Tyndall Centre for Climate Change Research, University of Manchester, Manchester, UK)

13:15 **LUNCH**

14:15 **CLOSE**