



58th SWST International Convention

Renewable Materials and the Bio-Economy

June 7-12, 2015

Jackson Lake Lodge, Grand Teton National Park,
Jackson, Wyoming



Sunday, June 7

- 3:00-6:00 Registration & Packet Pickup (Outside Explorers Room)
- 6:00-8:00 Opening Ceremony and Reception - Explorers/Trappers Room

Monday, June 8

- 7:00-8:00 Registration & Packet Pickup (Outside Explorers Room)
- 8:00-8:15 Welcome - Eric Hansen, General Chair of Convention; Oregon State University, USA
(All sessions will be held in Explorers Room, unless otherwise noted.)

- 8:15 to 10:00 **Biomass Chemistry for a Greener Environment**
Session Moderator: Michael Wolcott, Washington State University, USA

- 8:15-8:35 Jing Luo, Beijing Forestry University, China
Soybean Meal-based Adhesive Enhanced by a Commercial Epoxy Resin and a Post Heat Treated Process
- 8:35-8:55 Junming Xu, West Virginia University, USA
Fractionation of the Liquefied Lignocellulosic Biomass for the Production of Platform Chemicals
- 8:55-9:15 Sheldon Shi, University of North Texas, USA
Nanoparticle Impregnation Treatment of Natural Fiber for Functional Biocomposites
- 9:15-9:35 Weixing Gan, Guangxi University, China
Synthesis and Characterization of Sucrose-Melamine-Formaldehyde Adhesives
- 9:35-9:55 Yuxiang Huang, Beijing Forestry University, China
Preparation and Characterization of Activated Carbon Fibers from Liquefied Wood by KOH Activation
- 10:00-10:15 COFFEE BREAK

- 10:15-12:00 **Design for Environment: Use of Renewable Materials**
Session Moderator: Andreja Kutnar, University of Primorska, Slovenia

- 10:15-10:35 Philipp Sommerhuber, Thünen Institute of Wood Research, Germany
Environmental Product Design of Wood-Plastic Composites
- 10:35-10:55 Bruce Lippke, University of Washington, USA
Carbon Policy Failures and the Opportunity for Better Uses of Wood
- 10:55-11:15 Richard Bergman, US Forest Products Laboratory, USA
Life-Cycle Inventory Analysis of Laminated Veneer Lumber Production in the United States

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Monday, June 8 *continued*

- 11:15-11:35 Dick Sandberg, Luleå University of Technology, Sweden
Modification, Product Properties, and Environmental Impacts in Thermal Wood Processing
- 11:35-11:55 Pablo Crespell, FPInnovations, Canada
Tall Buildings - An Approach to Modelling Economic, Carbon, and Employment Effects
- 12:00-1:00 LUNCH
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- 1:00-2:45 **Wood-based Green Fuels and Chemicals**
Session Moderator: Patricia Townsend, Washington State University, USA
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- 1:00-1:20 Kevin Zobrist, Washington State University, USA
Beyond Biofuels: Shifting from Hardwood-based Transportation Fuels to Biochemicals
- 1:20-1:40 Michel Delmas, University of Toulouse, France
Wood Residues as Feedstock for the 3G CIMV Biorefinery
- 1:40-2:00 Armando McDonald, University of Idaho, USA
Development of a New Nanocatalyst for Upgrading Wood Pyrolysis Bio-oil to Green Fuels
- 2:00-2:20 Reza Hosseinpour, Islamic Azad University, Iran
Hydrothermal Processing Effects on Bioethanol Production from Lignocellulosic Material
- 2:20-2:40 Sun Joseph Chang, Louisiana State University, USA
An Economic Analysis of Bagasse as a Bio-fuel Feedstock
- 2:45-3:00 COFFEE BREAK
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- 3:00-4:45 **Biomass Energy: Innovations, Economic Realities, and Public Perception**
Session Moderator: Nikki Brown, Pennsylvania State University, USA
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- 3:00-3:20 Omar Espinoza, University of Minnesota, USA
Overcoming Barriers to Biomass Cogeneration in the U.S. Wood Products Industry
- 3:20-3:40 Jeremy Withers, Virginia Technological University, USA
Internal and External Barriers Impacting Non-food Lignocellulosic Biofuel Projects in the United States
- 3:40-4:00 Changlei Xia, University of North Texas, USA
Self-Activation Process for Biomass Based Activated Carbon
- 4:00-4:20 Robert Rice, University of Maine, USA
Loss-on-Ignition Testing of Wood Ash
- 4:20-4:40 Nikki Brown, Pennsylvania State University, USA
Fuel Bricks from Lignin and Coal Fines
- 5:00-6:00 Business Meeting

Tuesday, June 9

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- 8:15-10:00 **Early Stage Researcher Full Oral Slot (8 minutes)**
Session Moderators: David DeVallance, West Virginia University, USA and Tobias Keplinger, ETH Zurich, Switzerland
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- 8:15-8:20 Introduction
- 8:20-8:28 Claire Monot, Grenoble INP-Pagora, France
Development of a Sulfur-free Delignification Process for Softwood Biorefineries
- 8:30-8:38 Lawrence Aguda, Forestry Research Institute of Nigeria, Nigeria



Tuesday, June 9 *continued*

Effectiveness of *Gliricidia Sepium* Heart Wood Extractives as Preservative Against Termite Attack

- 8:40–8:48 Lufei Li, Beijing Forestry University, China
Activated Carbon Monolith Derived from Bio-char
- 8:50–8:58 Mubarak Adesina, Idaho State University, USA
Reliability Analysis of Wood Floor Vibrations Considering Sheathing Discontinuities
- 9:00–9:08 Peter Kessels Dadzie, Kumasi Polytechnic, Ghana
Predicting Bending Properties of Stem and Branch Wood of a Tropical Hardwood Species from Density and Moisture Content
- 9:10–9:18 Thanh Huynh, Oregon State University, USA
Modern Building Systems' 28' x 64' Modular Structure: SAP 2000 Wind Load Analysis
- 9:20–9:28 Oluwafemi Oluwadare, University of Ibadan, Nigeria
Potential of Seed Oil of *Hildegardia Barteri* (mast.) Kosterm for Biodiesel Production
- 9:30–9:38 Kojo Afrifah, Kwame Nkrumah University of Science and Technology, Ghana
Assessment of Factors Affecting the Quality of Sliced Veneer from Four Timber Species
- 9:40–9:48 Jussi Ruponen, Aalto University, Finland
Moisture Stability of Post-manufacture Thermally Modified Welded Birch (*Betula pendula L.*) Wood
- 9:50–10:00 Discussion
- 10:00–10:15 COFFEE BREAK

10:15–12:00 **Early Stage Researcher Full Oral Slot (8 minutes)**
Session Moderators: Dick Sandberg, Luleå University of Technology, Sweden and Bonnie Yang, Mississippi State University, USA

- 10:15–10:20 Introduction
- 10:20–10:28 Massih Nilforoushan, University of Utah, USA
Dimensional Optimization of Beetle Kill Pine Interlocking Cross Laminated Timber (ICLT).
- 10:30–10:38 Xuehua Wang, Nanjing Forestry University, China
Shearing Behavior of SIP Wall Shelled with Bamboo Scrimber Panel
- 10:40–10:48 Richard Bergman, US Forest Products Laboratory, USA
Life-Cycle Inventory Analysis of I-joist Production in the United States
- 10:50–10:58 Paige McKinley, Oregon State University, USA
Multi-scale Investigation of Adhesive Bond Durability
- 11:00–11:08 Jimmy Thomas, The Rubber Board, India
3D Visualisation of Spiral Grain and Compression Wood in *Pinus Radiata* with Fluorescence and Circular Polarised Light Imaging
- 11:10–11:18 Patrick Dixon, Massachusetts Institute of Technology, USA
Micro-compression of Solid Bamboo Fibers
- 11:20–11:28 Payam Hooshmand, Sharif University of Technology, Iran
Energy Use and Sensitivity Analysis of Energy Inputs for Canola Production (*Brassica napus L.*) in Iran
- 11:30–11:38 Johann Trischler, Linnæus University, Sweden
Particleboards Made out of Reed Canary Grass Glued with an Acrylic Adhesive
- 11:40–11:48 Kunqian Zhang, University of British Columbia, Canada
Low Density Moso Bamboo Surface OSB
- 11:50–12:00 Discussion



Tuesday, June 9 *continued*

12:00–1:00	LUNCH
1:00–2:00	Early Stage Researcher Speed Slot (3 minutes) Session Moderator: Michael Burnard, University of Primorska, Slovenia
1:00–1:03	Mesut Uysal, Purdue University, USA Determining Tension and Compression Strength and Basic Manufacturing Feasibility of CNC Router-cut Joints
1:03–1:06	Zhengbin He, Beijing Forestry University, China Heat and Mass Transfer during Ultrasound-Assisted Vacuum Drying of Wood
1:06–1:09	Luyi Chen, University of Minnesota, USA Comparative Life Cycle Analysis of Fossil and Bio-based PET Bottles
1:09–1:12	Bonnie Yang, Mississippi State University, USA Development of Industrial Laminated Bridge Planks from Southern Pine Lumber
1:12–1:15	Kyle Sullivan, Oregon State University, USA Effect of Cross-Laminated Timber Floor Diaphragm Orientation on Shear Stiffness and Strength
1:15–1:18	Cagatay Tasdemir, Purdue University, USA Trends in U.S. Furniture Trade
1:18–1:21	Shupin Luo, Beijing Forestry University, China Investigation of Lignin as Additive on the Properties of Wood Flour/Polypropylene Composites
1:21–1:24	Zachary Miller, North Carolina State University, USA Influence of Lignin Modification on Microfibril Angle in Young Transgenic Black Cottonwood Trees
1:24–1:27	Mesut Uysal, Purdue University, USA Increasing Service Life of Wooden Chairs
1:27–1:30	Jaromir Milch, Mendel University in Brno, Czech Republic Analysis of Mechanical Behavior of All-wooden Dowel Joint Using FEM and DIC
1:30–1:33	Hamed Olayiwola, University of Ibadan, Nigeria Effects of Cement Strength Grade and Particle Content on the Compressive Strength of Bamboo-cement Composites
1:33–1:36	Daniel Way, Oregon State University, USA Manufacturing and Mechanical Characterization of a 3D Molded Core Strand Panel
1:36–1:39	Jinxue Jiang, Washington State University, USA Multi-technique Characterization of Douglas-fir Cell Wall Deconstruction during Mechanical Milling Pretreatment
1:39–1:42	Adeyinka Adesope, University of Ibadan, Nigeria Preparation of Strips from <i>Bambusa Vulgaris</i> Sclerodermis Culms from Recycled Scaffold for Intermediate Raw Materials Production
1:42–1:45	Kendall Conroy, Oregon State University, USA Gender Diversity Impacts on Firm Performance in Forest Sector Firms
1:45–1:48	Stephen Tekpetey, Forestry Research Institute of Ghana, Ghana Investigating the Surface Quality of Tropical Hardwood Species: A Case of <i>Khaya ivorensis</i> from Ghana
1:48–2:00	Discussion

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Tuesday, June 9 *continued*

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- 2:00–4:00** **Mini Workshops** (Wrangler and Prospector Rooms)
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- 4:15–7:15** **Poster Session and Student Poster Competition (with Cash Bar and Refreshments)**
Moderator: Frederick Kamke, Oregon State University, USA
(Wapitii and Antelope Rooms)
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Wednesday, June 10

Optional Tour Day - Not included in Registration

Thursday, June 11

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- 8:15–10:00** **Nano to Macro Scale Wooden Composites**
Session Moderator: Levente Dénes, University of West Hungary, Hungary
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- 8:15–8:35** Armando McDonald, University of Idaho, USA
Grafted α -cellulose - poly(3-hydroxybutyrate-co-3-hydroxyvalerate) Biocomposites
- 8:35–8:55** Changle Jiang, West Virginia University, USA
Synthesis of TEMPO Cellulose Nanofibrils Stabilized Copper Nanoparticles and its Release from Antimicrobial Polyvinyl Alcohol Film
- 8:55–9:15** Levente Dénes, University of West Hungary, Hungary
Hierarchical PLA Structures Used for Wooden Sandwich Panel's Core Fortification
- 9:15–9:35** Todd Shupe, Louisiana State University, USA
Development of Wood Fiber-Polypropylene Laminates with Layer-By-Layer Assembly of Kraft Pulp Hand-Sheets and Polypropylene Films
- 9:35–9:55** Blake Larkin, Oregon State University, USA
Effective Adhesive Systems and Optimal Bonding Parameters for Hybrid CLT
- 10:00–10:15** COFFEE BREAK
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- 10:15 - 12:00** **Nano to Macro Scale Wooden Composites**
Session Moderator: Levente Dénes, University of West Hungary, Hungary
-
- 10:15–10:35** Frederick Kamke, Oregon State University, USA
Micro X-Ray Computed Tomography Study of Adhesive Bonds in Wood
- 10:35–10:55** Bryan Dick, North Carolina State University, USA
Continued Research into Fire Performance of Varying Adhesives in CLT Panels Constructed from Southern Yellow Pine
- 10:55–11:15** Pamela Rebolledo-Valenzuela, Université Laval, Canada
Gas Permeability and Porosity of Fiberboard Mats as a Function of Density
- 11:15–11:35** Min Niu, Fujian Agriculture and Forestry University, China
Pyrolysis of Si-Al Compounds and Plant Fiber in Burned Ultra-low Density Fiberboard
- 11:35–11:55** Xiaomei Liu, Mississippi State University, USA
Characterization of Polymerization of Isocyanate Resin and Phenolic Resins of Different Molecular Weights. Part I: Morphology and Structure Analysis

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Thursday, June 11 *continued*

12:00–1:00	LUNCH
1:00–2:45	Timber Physics from 1 μm to 10 m Session Moderator: Samuel Zelinka, US Forest Products Laboratory, USA
1:00–1:20	Samuel Zelinka, US Forest Products Laboratory, USA Subcellular Electrical Measurements as a Function of Wood Moisture Content
1:20–1:40	Oliver Vay, Wood K Plus, Austria Thermal Conduction Behavior of Wood at Macroscopic and at Cell Wall Level
1:40–2:00	Hong-jian Zhang, Southwest Forestry University, China Mechanism and Regularity of Bending Creep Behavior of Solid Wood Beam in Varying Humidity
2:00–2:20	Guizhou Wang, North Carolina State University, USA Moisture and Heat Transfer in Cross Laminated Timber
2:20–2:40	Petr Cermak, Mendel University in Brno, Czech Republic Analysis of Dimensional Stability of Thermally Modified Wood Affected by Wetting-Drying Cycles
2:45–3:00	COFFEE BREAK
3:00–4:45	Novel Techniques for a New Era of Wood Construction Session Moderator: Arijit Sinha, Oregon State University, USA
3:00–3:20	Jerome Johnson, University of Wisconsin-Stout, USA Analysis and Development of Green Roof Structures
3:20–3:40	Robert M. Knudson, FPInnovations, Canada Wood Solutions to Satisfy Energy Codes in Building Construction
3:40–4:00	Zahra Ghorbani, University of Utah, USA Easy Assembly Systems: Integration of Post-Tensioned Heavy Timber and Smart Architecture in Construction Practices
4:00–4:20	Arijit Sinha, Oregon State University, USA Design and Performance of Steel Energy Dissipators to be Used in Cross-Laminated Timber Self-Centering Systems
4:20–4:40	Kristopher Walker, Oregon State University, USA Use of Virtual Visual Sensors in Obtaining Natural Frequencies of Timber Structures

Friday, June 12

SWST Concurrent Session (Explorers Room)

8:15–10:00	Treatments and Durability Session Moderator: Dodi Nandika, Bogor Agricultural University, Indonesia
8:15–8:35	Paul Frederik Laleicke, Oregon State University, USA Non-Destructive Detection and Monitoring of Durability Issues in Full-Scale Wall Envelopes under Accelerated Weathering
8:35–8:55	David Bueche, Hoover Treated Wood Products, USA What is Fire-Retardant-Treated Wood?
8:55–9:15	Charles Edmunds, North Carolina State University, USA Fungal Pretreatment of Genetically Modified Black Cottonwood - Merging Novel Low-input Fungal Pretreatment with Next-generation Lignocellulosic Feedstocks

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Friday, June 12 - SWST Concurrent Session *continued*

- 9:15–9:35 Roger Rowell, University of Wisconsin, USA
Understanding Decay Resistance, Dimensional Stability and Strength Changes in Acetylated Wood
- 9:35–9:55 H. Michael Barnes, Mississippi State University, USA
Effect of Preservative Treatment on I-joint Bending Stiffness
- 10:00–10:15 COFFEE BREAK
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- 10:15–12:00 **Wood Quality and Improvement**
Session Moderator: Wayan Darmawan, Bogor Agricultural University, Indonesia
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- 10:15–10:35 Qi-Lan Fu, Université Laval, Canada
Optimization of Thermo-hygro-mechanical Densification Process of Sugar Maple Wood
- 10:35–10:55 Per Otto Flæte, Norwegian Institute of Wood Technology, Norway
Non-destructive Pre-harvest Measurement of Diameter Profiles of Standing Mature Pine Trees by Terrestrial Laser Scanning (TLS)
- 10:55–11:15 Brian Bond, Virginia Tech, USA
Properties of Plantation Grown KOA
- 11:15–11:35 Wayan Darmawan, Bogor Agricultural University, Indonesia
Wear Characteristics of Multilayer Coated Cutting Tools in Milling Wood and Wood-Based Composites
- 11:35–11:55 Victor Grubii, Luleå Tekniska Universitet, Sweden
Influence of Wetting Processes on Surface Quality during Scots Pine Planing
- 12:00–1:00 LUNCH
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- 1:00–2:45 **Fiber Properties Chain: From Cell Wall to End Products**
Session Moderator: Jean-Michel Leban, INRA, France
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- 1:00–1:20 Jean-Michel Leban, INRA, France
Assessing Timber MOE&MOR in the Forest Resources: What we have learned during the Last Twenty Years
- 1:20–1:40 Patrick Dixon, Massachusetts Institute of Technology, USA
Bending Properties of Clear Bamboo Culm Material from Three Species
- 1:40–2:00 Milan Sernek, University of Ljubljana, Slovenia
Tannin-based Foams from the Bark of Coniferous Species
- 2:00–2:20 Gloria Oporto, West Virginia University, USA
Drying Cellulose-Based Materials Containing Copper Nanoparticles
- 2:20–2:40 Zachary Miller, North Carolina State University, USA
Anatomical, Physical and Mechanical Properties of Transgenic Loblolly Pine
- 2:45–3:00 COFFEE BREAK
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- 3:00–4:45 **Fiber Properties Chain: From Cell Wall to End Products**
Session Moderator: Jean-Michel Leban, INRA, France
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- 3:00–3:20 Tuhua Zhong, West Virginia University, USA
Hybrids of TEMPO Nanofibrillated Cellulose and Copper Nanoparticles Embedded in Polyvinyl Alcohol Films for Antimicrobial Applications
- 3:20–3:40 Bonnie Yang, Mississippi State University, USA
Comparison of Nondestructive Testing Methods for Evaluating No.2 Southern Pine Lumber: Bending Stiffness

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Friday, June 12 - SWST Concurrent Session *continued*

- 3:40–4:00** Bambang Suryoatmono, Parahyangan Catholic University, Indonesia
Distortion Energy Criterion for Estimating Dowel Bearing Strength of Timber Member Loaded at Angle
- 4:00–4:20** Kate Semple, University of British Columbia, Canada
Comparison of Stranding and Strand Quality of Two Giant Timber Bamboo Species; Moso (*Phyllostachys pubescens* Mazel) and Guadua (*Guadua angustifolia* Kunth) Using a CAE 6/36 Disk Flaker
- 4:20–4:40** Justin Crouse, University of Maine, USA
Temperature and Humidity Dependent Mechanical Performance of Nanocellulose and its Composites

Friday, June 12

IUFRO 5.10 Forest Products Marketing and Business Concurrent Session (Homesteader Room)

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- 8:15–10:00** **IUFRO 5.10 Forest Products and Communities**
Session Moderator: Rajat Panwar, University of British Columbia, Canada
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- 8:15–8:35** Rajat Panwar and Rob Kozak, University of British Columbia, Canada
Business Management Research in the Forestry Sector: Past, Present and Future Directions
- 8:35–8:55** Anne Toppinen, University of Helsinki, Finland
Challenges in Communicating Forest Industry Sustainability to the General Public: Results from a Four-country Comparison in Europe
- 8:55–9:15** Jianping Sun, Guangxi University, China
Study on 1/f Features of Wood Texture Changes Based on Spectrum Analysis
- 9:15–9:35** Matti Stendahl, Swedish University of Agricultural Sciences, Sweden
Operations Management, Cooperation and Negotiation in the Wood Supply Chain – The Relationship Between Sawmills and Sawlog Suppliers
- 9:35–9:55** E. M. (Ted) Bilek, USDA Forest Products Laboratory, USA
Nanocellulose Market Volume Projections: A Derived Demand Analysis
- 10:00–10:15** COFFEE BREAK
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- 10:15–12:00** **IUFRO 5.10 Forest Products and Communities**
Session Moderator: Rajat Panwar, University of British Columbia, Canada
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- 10:15–10:35** Henry Quesada-Pineda, Virginia Tech, USA
A Demand-pricing Management Approach to Add Value in the U.S. Hardwood Industry
- 10:35–10:55** Kristian Byenheim, Norwegian Institute of Wood Technology, Norway
Comparing Health, Emotional Well-being and Indoor Environment in Solid Wood and Brick Built Student Housing
- 10:55–11:15** Magnus Larsson, Swedish University of Agricultural Sciences, Sweden
Mapping of Wood Supply Chains, a Case Study
- 11:15–11:35** Michael Burnard, University of Primorska, Slovenia
Comparative Analysis of European Forest Sector Production 2008–2013

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Friday, June 12 - IUFRO 5.10 Concurrent Session *continued*

11:35–11:55 Eini Lowell, Pacific Northwest Research Station, USA
Market Appeal of Hawaiian Koa Wood Product Characteristics: A Consumer Preference Study

12:00–1:00 LUNCH

1:00–2:45 **IUFRO 5.10 Forest Products and Communities**
Session Moderator: Rajat Panwar, University of British Columbia, Canada

1:00–1:20 Jaana Korhonen, University of Helsinki, Finland
To Own Forest or Not? Vertical Integration in Pulp and Paper Sector

1:20–1:40 Liina Häyrynen, University of Helsinki, Finland
Exploring the Future Use of Forests in Finland: Perspectives from Sustainability Oriented Forest Owners

1:40–2:00 Ed Pepke, Dovetail Partners, France
Impacts of Policies to Eliminate Illegal Timber Trade

2:00–2:20 Tobias Schauerte, Linnaeus University, Sweden
Lean Thinking for Improving the Production and Material Flow: Increasing the Capacity and Profitability of a Swedish Wooden Single-Family House Producer

2:20–2:40 Sudipta Dasmohapatra, North Carolina State University, USA
Bio-Based Energy in the Southeast United States: A Stakeholder Perception Study

2:45–3:00 COFFEE BREAK

3:00–4:45 **IUFRO 5.10 Forest Products and Communities**
Session Moderator: Rajat Panwar, University of British Columbia, Canada

3:00–3:20 Wei-Yew Chang, University of British Columbia, Canada
Matching Market Signals to the Canadian Wood Products Value Chain: A Disaggregated Trade Flow Analysis

3:20–3:40 David DeVallance, West Virginia University, USA
Hotspot Markets and Specifier Perception for Wood-Based Materials in Appalachian LEED Building Projects

3:40–4:00 Iris Montague, USDA Forest Service, USA
The Forest Products in a Digital Age: The Use and Effectiveness of Social Media as a Marketing Tool

4:00–4:20 Manja Kitek Kuzman, University of Ljubljana, Slovenia
Demographic Changes and Challenges in the Woodworking Industry

4:20–4:40 Arsenio Ella, Forest Products Research and Development Institute, Philippines
Almaciga Resin and Wild Honey the Backbone of Indigenous Peoples in Palawan, the Philippines

6:00–9:00 **Closing Ceremony and Barbecue Banquet - Pool Terrace Area**
(including Cowboy Music by Vince & Mindi)
