

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*

## Course Faculty



**Thomas Amidon** is Professor in the Paper and Bioprocess Engineering department (PBE) at the State University of New York, College of Environmental Science and Forestry (SUNY ESF). He worked previously with International Paper from 1976 to 2000. He is experienced in industrial processes, commercial scale-up of pilot operations, regulatory aspects, design and quality improvement. Tom's expertise is unusual in that it encompasses significant experience in both academic and industrial arenas, and he is conversant with both technology development and commercial process implementation. Tom holds a B.S. in Forest Management and an M.S. in Forest Tree Improvement, as well as a Ph.D. in Silviculture from SUNY ESF. Tom is recipient of the SUNY ESF Exemplary Researcher Award for 2013 and the 2015 Central New York College division Technology Educator of the Year award.



**Peter Axegård** has over 30 year of experience with technology development within the pulping industry. Between 1996 and 2002 Peter was program director for the Swedish national research program "The Eco-cyclic Pulp Mill" where several aspect of increased resource efficiency of kraft pulping were evaluated. The program gave birth to three patents which are essential for pulp mill bio-refining such as the LignoBoost process. Since then his efforts have been directed towards new products from wood using the kraft pulp mill as the technical platform with the overall aim of maximum value creation of forestry residues and pulp wood. Biorefining is now a major research area at Innventia. One of the major efforts is on lignin based carbon fibers. One other major effort is a 2G process for sugar from lignocellulose with lignin as a by-product. Peter was recognized by RISI 2008 as one of the pioneers in developing the biorefinery concept. In 2009 he was awarded the Swedish Ekman medal. The LignoBoost process was sold to Valmet 2009 and the first two commercial installations are running since early 2013 and 2015 respectively.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Tom Browne** obtained his B.Eng in mechanical engineering, and his PhD in chemical engineering, both from McGill University. He joined Paprican (now FPInnovations) in 1994 to work on energy use in pulp and paper processes in general, and in mechanical pulping processes in particular. During that period, he edited monographs on energy and water use in pulp and paper processes which remain well-respected handbooks today. Tom was named Program Manager, Mechanical Pulping, in June 2001. Since 2006, he has worked to develop a coordinated approach to research in the area of the forest biorefinery. In 2011, he led the development and start-up of the Bio-Economy Technology Centre in Thunder Bay, Ontario, dedicated to piloting new processes for the forest sector. That pilot plant was a critical component in the commercialization of the LignoForce™ process for extracting lignin from kraft black liquor, with the first installation set for startup in fall 2015. His current title is Research Manager, Biorefinery.



**Richard Berry** is Vice President and Chief Technology officer at CelluForce. He was leader of the nanotechnology initiative at FPInnovations until moving to CelluForce in 2011. Richard has numerous scientific accomplishments and a long experience for the industrial application of numerous inventions. He received the 2009 Nano-industry award from NanoQuébec for his exceptional contribution to the development of Nanocrystalline Cellulose. He is the winner of the 2012 Purvis Memorial Award, is one of Canada's Clean 50 honourees and most recently was honoured with the first TAPPI Nanotechnology Division Award and IMERYS prize. He has received many pulp and paper Industry awards and is a TAPPI Fellow. Richard received a Bachelor of Arts Degree in Chemistry and Geology from Keele University in Staffordshire, England in 1975. In 1980 he earned a Ph.D. in Chemistry from McGill University in Montreal, Canada.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Biljana Bujanovic** is an Associate Professor at SUNY-ESF, Syracuse, NY with a dual Ph.D. in Wood Chemistry from Belgrade University, Serbia and in Paper Science and Engineering from Western Michigan University, MI. Her main interest is the structure, reactivity, and application of lignin. Her expertise in lignin has helped to understand the critical role of lignin in defining high-value low-volume byproducts in lignocellulosic biorefineries. In recent years, her research group has studied novel methods in delignification and products from lignin recovered in these processes. This work has been presented at national and international conferences and published in peer-reviewed journals and monographs.



**Virginie Chambost** is Co-Founder and Principal Consultant at EnVertis Inc, a consulting services company dedicated to assisting the forest, agriculture and allied sectors to identify strategies for improving and/or transforming businesses. Virginie obtained her MBA in innovative project management at the University of Lyon in France. She has worked at New Zealand's forest research center, SCION, and was project director in the Chemical Engineering Department at École Polytechnique in the NSERC Environmental Design Engineering Chair. Virginie's major contributions have been related to the development of market-based methodologies for the identification of promising market pathways and business plans for implementing sustainable biorefinery configurations, and defining innovative partnership models.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Frédéric Clerc** is project manager at EnVertis, a consulting company dedicated to supporting the forestry products industry in the identification and implementation of context-specific biorefinery strategies. After obtaining his engineering diploma in France, Fred worked in management consulting with BearingPoint Europe, designing and implementing large-scale company transformation programs. More recently, he obtained a postgraduate diploma at Ecole Polytechnique Montréal in Energy and Sustainable Development from the Department of Chemical Engineering. He is currently leading several biorefinery projects with EnVertis, involving the gamut of technology pathways, to develop transformational strategies for commodity and added value products.



**Doug Freeman** is currently the Engineering Manager, Verso Corporation Escanaba Paper Company. Doug is the Leader of the engineering staff Escanaba Paper Mill. Additionally, he is works on strategic projects at Escanaba Paper Mill and involved in planning the energy future of the mill. He has 35 years engineering and operations experience in the chemical, engineering and pulp and paper industries. Doug has held positions in process engineering, project engineering, operations management, and technical management. He is a graduate of the University of Wisconsin – Madison with a BSChE degree, and is a Professional Engineer licensed in Wisconsin and Michigan. TAPPI member since 1986.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Gopal Goyal** has spent more than two decades researching, developing and implementing new pulp and paper technologies that have advanced industry science, including in the leading edge fields of nanotechnology and biorefinery. He did his graduate work at University of Washington, Seattle in Chemical Engineering and pulp paper. Currently a Chief Scientist with International Paper (IP) in Loveland, Ohio, Gopal has 13 industry-related patents granted during his career. As part of his responsibilities at IP, he scouts out new technologies that help reduce manufacturing costs and initiates and manages externally funded research programs.



**Jean Hamel** is Vice President, Pulp, Paper and BioProducts at FPInnovations and has more than 28 years of experience in R&D in the Forest Product Industry. As Vice President since 2009, Jean has been developing, with his team of 220 researchers and technologists, an innovation and R&D program to develop new bio-chemicals and biomaterials and their applications, as well as supporting the operational excellence of the Forest Product Industry. Under his management, three major technologies have been brought to the demonstration phase including cellulose nanocrystals (CNC) with CelluForce, and more recently cellulose filaments (CF) with Kruger and the LignoForce lignin plant with West Fraser.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Lamfeddal Kouisni** is a Research Scientist at FPInnovations, in the Biorefinery & Energy Program. He and his supervisor Dr. Michael Paleologou developed the LignoForce System™, a patented process for the recovery of lignin from black liquor. The process is the basis for Canada's first commercial lignin plant currently under construction at the West Fraser Timber kraft pulp mill in Hinton, Alberta. Lamfeddal holds Ph.D and B.Sc degrees in Chemistry from the University Hassan II - Casablanca, Morocco and a PhD from the Laboratory of Electrochemistry and Physical Chemistry of Materials and Interfaces - Grenoble, France.



**Adriano Mariano** is Professor of Chemical Engineering at UNICAMP (Brazil). His research is focused on the development of fermentation technologies, design methodologies, and techno-economic studies to serve the emerging forest and sugarcane biorefinery industries. Prior to joining UNICAMP in 2015, Adriano was a senior researcher at Fibria, working with development and assessment of biorefinery strategies. In previous years, Adriano served as researcher in different institutions (École Polytechnique de Montréal, Ohio State University, and the Brazilian Bioethanol Science and Technology Laboratory - CTBE), including consulting services for EnVertis Inc and the Sugarcane Technology Center (CTC). He recently had a paper published by O Papel, June 2015, titled *How Brazilian pulp mills will look like in the future?*

TAPPI Professional Development Course  
***Designing the Forest Biorefinery***



**Shabnam Sanaei** is Biorefinery Specialist at Domtar Inc. in the R&D department. Her focus is on the evaluation of potential transformational biorefinery strategies, and also the assessment of potential opportunities for valorization of side streams. She has PhD from the Chemical Engineering Department at École Polytechnique of the University of Montréal. Before joining Domtar, Shabnam had worked as a project manager in EnVertis Consulting Inc., and as a process engineer in MAPNA Group. Shabnam's major contributions have been related to strategic decision making under uncertainty and risk for integrated biorefinery strategies considering their sustainability performance.



**Paul Stuart** is a Professor of Chemical Engineering at École Polytechnique in Montréal, where he held the NSERC Chair in Design Engineering (2000-2013), and currently is the Scientific Director of the Value Chain Optimization (VCO) Network. Paul is also Co-Founder and Principal Consultant at EnVertis Inc, a consulting services company dedicated to assisting forest product companies identify strategies for improving and/or transforming existing business models. Prior to returning to academia, Paul was Partner and Director of Environmental Services at Simons Environmental Group, and Director of Process and Environmental Engineering at H.A. Simons Limited (later AMEC). He received his PhD in Chemical Engineering from McGill University. Paul is a Fellow of the Canadian Academy of Engineering, a Fellow of PAPTAC, past President of the Canadian Society of Chemical Engineering (CSChE), and Editor-in-Chief of Journal of Science and Technology for Forest Products and Processes (J-FOR). He also co-edited the book *Integrated Biorefineries: Design, Analysis, and Optimization*, published by Taylor and Francis - CRC Press.

TAPPI Professional Development Course  
*Designing the Forest Biorefinery*



**Per Tomani** is Team Leader for Innventia's Lignin and Carbon Fibres R&D areas, and is one of the inventors of the LignoBoost process. He has been active in R&D for the pulp and paper industry since he joined Innventia in 1991. Between 2002 and 2008, Per was the R&D Programme Director of the FRAM (Future Resource Adapted Pulp Mill) R&D programmes, financed by the industry and the Swedish Energy Agency. The R&D focus in the FRAM programmes was mainly on wood chip pre-treatments before pulping and lignin removal from kraft black liquors using different technologies and approaches. This work resulted in the LignoBoost process. Per was CTO of the company LignoBoost AB, previously a subsidiary of Innventia, before the technology was sold to Valmet. During that time, he was responsible for the installation, re-building and start-up project in which the LignoBoost technology was demonstrated over 2006-2008.



**Adriaan van Heiningen**

**Present**

Professor – Department of Chemical and Biological Engineering, University of Maine, Orono, ME, USA

**Past**

1977-1983; Norit, The Netherlands: Research Group Leader, Gas and catalyst applications of activated carbon

1983-1991; Paprican/McGill University: Senior Scientist and Adjunct Professor in Chemical Engineering.

1991-1998; University of New Brunswick: Professor in Chemical Engineering, Director Limerick Pulp and Paper Centre

2007-2014; Finland Distinguished Professor (FiDiPro) and Visiting Research Professor – Aalto University, Department of Forest Products Technology, Espoo, Finland