

ECAMOB

TF1 Wood Mobilisation

Innovawood GA 2015, June 10-11

Zagreb, Croatia

Thematic Workshop

Erkki Verkasalo

TF Participants

- Finland: Luke (Leena Paavilainen, Erkki Verkasalo)
- Spain: CTFC (Denis Boglio), CREAM (Olga Roig, Jordi Vayreda), AIDIMA (Guillem Segura)
- Sweden: SkogForsk (Lars Wilhelmsson)
- France: FCBA (Gerard Deroubaix)
- Germany: TU Munich (Jan-Willem van de Kuilen), Uni Göttingen (Markus von Willert)
- Netherlands: ALTEIRA (Mart-Jan Schelhaas)
- S-WINN (Thomas Naeher)
- NORVIK Timber (Sampsa Auvinen)
- EFI (Harald Mauser)
- InnovaWood (Gus Verhaeghe)

Overall contents

**How can we get more wood from European forests
- accepting the limits of sustainable management!**

Key objectives – common to all TFs

Creation of jobs in exchange of an increased use of wood

Creation of growth within the EU

Improved coordination within and between the value chains

Links/coordination with other commitments and initiatives

Reflections that have to be included

How to integrate the aspects of international markets?

What geographical scope should be kept ? EU-only or global?

Should future challenges like e.g. the use of arable land for wood production be taken into considerations?

Sustainable wood mobilisation involves

- Collecting existing and developing novel practices and policies along value chains for increased and sustainable supply of wood according to the quality needs
- Providing practical recommendations with guidance for policy-makers and value chain stakeholders,
- concrete actions for application.
- possible demonstration activities and dissemination of results

It may cover: 1) effective forest ownership and land tenure; 2) management, co-ordination and planning; adequate forest infrastructures and logistics; 3) suitable market structures and transparency; 4) improved recovery channels of post-consumer materials; 5) adequately trained workforce; 6) structures and instruments for improved access to finance and public incentives and supportive legal framework; 7) silvicultural measures through intensified forest management (including higher-growth species and forest breeding and plant material refinement).

Definition of wood mobilisation

May mean different scopes:

From a very limited one, such as wood extraction technology to wood product industries, to a quite large one involving a multitude of economic, social and environmental items.

The first one means efficiency of wood value chains in narrow sense: being efficient in producing the right things from the beginning to meet current and induce new sustainably based demands at the end.

The second one may involve socio-economic potential and barriers, physical and techno-economic supply of wood-based materials, end-use oriented and optimized raw material flows, and supply-demand relationships that affect all levels of wood value chains.

Technological / business economic aspects and targets

- The logging conditions and timber uses vary largely between the European countries, but the ***potential of technology development and adoption*** exists everywhere. The potential of ***doing the right things*** from the beginning and doing it ***efficiently in different forest and wood supply conditions*** is large.
- Potential ***added value and/or reduction of waste***, thus, generating more income through entire value chain. In the development of ***resource utilization efficiency***, a potential cost reduction 20-40% can be seen in logging operations of industrial roundwood.
- More consideration should be paid to the ***silent knowledge and expertise of forest machine operators***, and their capabilities and tools for optimal tree bucking to the desired log assortments and qualities for wood product industries. This should include also comprehensive training programmes of the operators.
- ***Climate change threatens*** the different regions of Europe in different ways. The three common topics are: 1) adaptation to increased problems in terrain trafficability and seasonality of forest operations, 2) adaptation to extreme abiotic and biotic events in forestry and 3) sustaining productivity of forest soil through good planning and suitable equipment.

Technological / business economic aspects and targets

- ***The New generation Forest IT tools and systems*** aiming from multi-source information on forests and raw materials and measurements and observations on the operational environment to intelligent and self-learning decision support systems through modern modelling, planning and information logistics are near the crucial technology jump. They involve better management of harvesting both at system and machine levels, adoption of best practices in forest management toward the desired log raw materials and implementation of new inventory methods, data and models in the sense of systems approach.
- ***The next generation system for forest resource management*** requires method development both for cost effective data acquisition and updating by remote sensing combined with other technologies and for data management. ***Advanced decision support systems*** require better methodology to estimate the value of tree stands for various wood conversion processes, novel measures and tools for planning alternative forest management practices and assessing their impacts and multi-source data in forest regeneration.
- ***Forest management practices, species selection and sites available for tree growing have changed and are still under transformations in different parts of Europe.*** This is reflected in the wood quality for wood products industries, and should be taken into account when planning the industrial strategies and operations of wood utilization.

Environmental aspects and targets

- ***To manage the GHG emissions balance***, new tools for calculating (planning) and monitoring (follow up) emissions are needed for wood procurement. Consumption of fossil fuels and utilisation of ecological alternatives can be enhanced by the development of efficient transportations. Less physiological loads should be caused for trees and nature.
- ***Role of forest management and logging operations on forest dynamics and on forest health*** should be also in the focus, also considering simultaneously the eventual trends from climate change – pests, decay, drought. This is an ongoing process at the moment, but the effort has been made only in the regions where wood production is important
- ***Tree breeding and choice of tree species*** may add some 5 to 40% in growth potential and possibilities to improve some target wood properties. ***Forest management models for reducing/managing risks and improving growth potential*** of the genetic material without adding loads above sustainable levels.
- ***Logging and reforestation technology*** (machines, ICT, measurements etc.) making the preferred forest management models affordable and efficient in operation as well as better planning tools for terrain and road trafficability contribute also to the care of forest environment.

Environmental aspects and targets

- It is a big challenge ***how to assess the environmental performance of wood mobility***. There are systems under development. ***New and standardized technology*** is needed for monitoring harvester performance together with already standardized harvester production files (including GPS coordinates). ***Algorithms, new sensor techniques and quality certification routines*** for forest operations will all be powerful means for monitoring operational environmental performance.
- ***Changes in forest soil due to wood procurement and extraction*** are an item in itself. This is crucial all over Europe, but especially in the Mediterranean countries, where both post-harvest nutrition, erosion control and forest fire protection require a special attention. Effects of logging technology and machines used should be considered. Belowground biomass and carbon dynamics of dead wood after harvesting operations may have significant effects for soil quality and further growth potential.

Societal and economic aspects

- ***Well-functioning mobility and supply of industrial wood***, especially for wood product industries, have a big role and importance of for regional welfare and economic viability in many European countries. ***Economic performance*** of wood mobility needs to be assessed ***both in the context of micro-economy for different parties of wood value chain and macro-economy for the society and regions, and extended to the policy and decision makers.***
- ***Economic drivers and barriers*** to wood mobility in timber trade should be addressed better country by country, and establish the opportunities and constraints for the enhancement, especially from the point of view of wood product industries (saw mills, plywood mills, wood panel mills). ***Studying the structures of forest ownership and finding means for its improvement*** toward more comprehensive and profitable management, logging and supply units should be a common target in Europe. ***Weak attraction of forest and logging work and education to the professions*** is also a common problem, reducing for example the profitability and restricting the growth of forest machine entrepreneur companies in Nordic countries.

Societal and economic aspects

- ***Matching wood extraction potential and land-use planning*** is a big societal issue for forest and wood product clusters. Restrictions of final cuttings, not only because of biodiversity but also other potential uses of forests limit the potential of mobilising saw and veneer logs, in particular. The commonly acknowledged goal to increase building and living with wood should be ensured through ***adequate local log supplies***, reducing then the needs of log import for example to Central Europe or Nordic countries. On the other hand, the ***renaissance of pulp industries*** and potential ***start-up of large-scale biorefineries*** in Nordic countries require an ***increasing mobilisation of fiber, thus calling for simultaneous increase in saw and plywood milling***.
- ***In the Mediterranean countries, there is still a widespread problem of land abandonment*** which starts only now to be acknowledged by the authorities. The climate change rationale has also put wood under the spotlight as a sustainable substitution to cement and metal, but these countries still lack behind the rest of Europe in that sense. Nevertheless, premiums have been given recently to wood construction in several regions as a way to raise social awareness. The forest ownership is relatively well structured with associations covering the most part of the territory but they are not commercially oriented.

Societal and economic aspects

- There's been a game-changing development during the last ten years in many Central European and Nordic countries and a starting progress in the rest of Europe with the **increase of wood energy market**. The **pulp industry is still the one with the most influence on large supply routes**, but recently large co-generation units have been installed, for example near ports in Italy and France, and it is redefining the supply route and price structures. At that precise moment it creates some tensions like for example the **lack of processors or transport trucks** in the area, though the companies are actually investing at the moment to increase their capacities. This has created **a buffer of new permanent wood mobilisation** in most if not all regions in the Mediterranean.
- This in turn has helped **consolidate forest work companies**, but also in a few years from now, will probably put a **strain on planning instruments**. Most planning instruments and methodologies were devised when mobilisation was weaker and with less growth perspectives than now; it means this will have to evolve **towards a more production oriented focus**.

Societal and economic aspects

Other supply aspects: 1) competition of wood resources between different industries (mechanical, pulp and paper, bioenergy, biorefining), 2) changing raw material stock, new types of felling stands and operations, increase of fast-grown wood in the market, pricing potential, 3) wood pricing systems for payments to forest owners, for example tree or tree part pricing or index valuation in order to free bucking to fit different forest operations, assortments etc. to the forest industry demands and preferences, 4) global/european movement and transportation of raw materials. 4) substitution considerations – wood / other materials / mixtures.

Other market organization aspects (affecting raw material demand and allocation): 1) challenges of changing product markets (continents, countries, product groups), 2) challenges of changing customer groups (also overseas), 3) combining timber trade with wood harvesting and silviculture service to forest owners. ***The big question is still nowadays how to match wood demand and supply – globally, regionally and locally, during different market cycles (derived from product demand).***

Needs of multi-criteria analysis

Some common themes which are necessary objectives for both research and development and transfer and extension of knowledge are listed as follows:

- * How to measure the different aspects and weigh them for proper conclusions for the management of wood value chains?
- * As the resource utilization decisions impact the different objectives of the parties in the value chains, how to find the best choices?
- * What are the specific challenges of logistics where holistic multi-criteria analysis is needed?
- * How to select the best practices and transfer and adopt them cross borders?
- * How the parties of wood value chains should work together to implement best the systems analysis approach?



State of Europe's Forests 2011

Status & Trends in **Sustainable Forest Management** in Europe

While productive, European forests also play an important role in the conservation of biological diversity and the area of forest primarily designed for this purpose is expanding. Moreover, while globally, terrestrial carbon stocks are decreasing as a result of the loss of forest area, thus causing substantial carbon emissions, forest in the FOREST EUROPE region store and sequester increasing amounts of carbon in their biomass.

Nevertheless, it should not be forgotten that European forests still face severe threats, such as the effects of climate change including climate variability. **Europe will also need to address an increasing pressure on resources, and competition amongst uses such as wood energy, timber production, biodiversity conservation and carbon storage.** This will make sustainable forest management even more crucial tool to maintain healthy, diverse and productive forests.



Improved wood mobilization

**Sustainable
forest biomass
production**



**Future
incentives**



**Today's
incentives**



**Technology development to produce competitive
solutions**

EOS



Next steps for EOS/EPF/CEI-Bois

PREPARE AND PROPOSE A FULL SCALE PROJECT PLAN TO BE PROPOSED FOR THE HORIZON 2020 FINANCING

- Full blown **investigation of the existing data on wood raw material supply and demand patterns** in Europe and around the world.
- Detailed investigation on the **efficiency of existing forest ownership models and concepts** in terms of wood supply and sustainability.
- Study on the **efficiency of existing legal and promotional measures** to improve the mobilisation of the forest resources
- Setting up the **targets for the improved mobilisation schemas** to be developed
- **Development of new, innovative forest mobilisation measures** including enhanced ownership models.
- **Piloting the best accepted new measures and ownership models** for the wood resource mobilisation

SWEETSTOCK - Sustainable Wood Feedstocks for Bioeconomy

- To demonstrate how EU can produce 20% more wood to the industries through enhanced silviculture
- To bring the wood resource and its potential to the awareness of forest owner and visible to the wood markets by novel forest management practices, IT-tools and smart systems
- Introduce and demonstrate intelligent and resource efficient machinery and transportation fleet for the feedstock supply for future customers and transfer it over entire EU
- Introduce policy measures that support sustainable wood mobilization and other ecosystem services in harmony with all categories of forest owners

Scope

- Cost competitive raw material base for the re-industrialization of forest sector
- Technology-intensive development of wood supply
- Digitalization of the wood chain

Partners

■ Finland

- Natural Resources Institute Finland
- StoraEnso Ltd. (Large forest company)
- Kesla Ltd. (Forest machine manufacturer)
- Joensuu Science Park

■ Sweden

- Skogforsk (Research body)
- Swedish University of Agricultural Sciences
- Komatsu Forest (Forest machine manufacturer)
- Teknologiska klustret (Research – practice interface)

■ Germany

- Albert Ludwigs Universität, Freiburg
- Unique, Forest and Land Use GMBH, SME

■ Spain

- AIDIMA (Technology Institute on Furniture, Wood, Packaging and related industries)

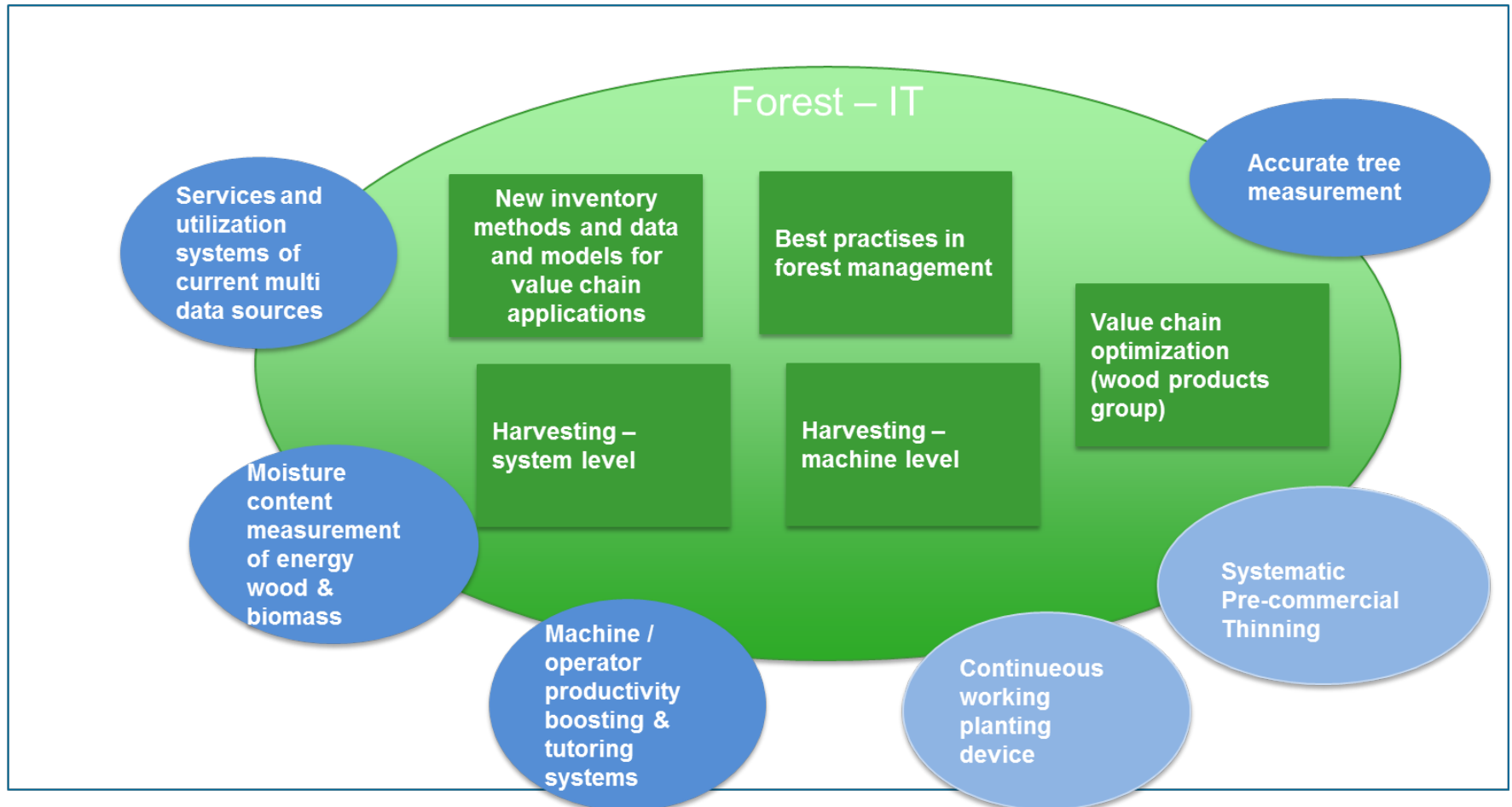
■ Latvia

- Latvian Forest Research Institute

Activity

- **Best trees and forest management for feedstocks of bio-economy**
 - EU's forest resource is vast, 24 billion m³ in terms of growing stock
 - It enables a wide alteration of outputs through creative and future oriented management
 - Future raw material needs of selected biorefinery concepts
- **Increase general awareness of forests as sustainable source of renewable biomaterial for forest owners, manufacturing industry and consumers inside and outside Europe**
 - EU's forest is owned by 15 000 000 non industrial private forest owners, large number of companies and public bodies such as states and municipalities.
 - Entirely new approaches to bring the forest and wood visible to forest owners and to buyers of wood.
 - Set of modern, social media and internet based solutions supporting forest owners to express the possibilities of the forest holding.
- **Efficient feedstock supply**
 - New forest machine solutions and approaches to use the existing harvesting and transport fleet resources more efficiently
 - Analyzing the supply patterns of wood and different wood processing industries, the seasonal variation of fleet use can be diminished
 - Reaching distant, untapped resource
- **Policies for wood mobilization**
 - Technology, energy, industrial, environmental and forest policies analysis
 - Approaches, where the wood supply chain between forest owners, wood suppliers and users is streamlined using new IT -solutions, incentives to support efficient organizations and new approaches for forest resource management.

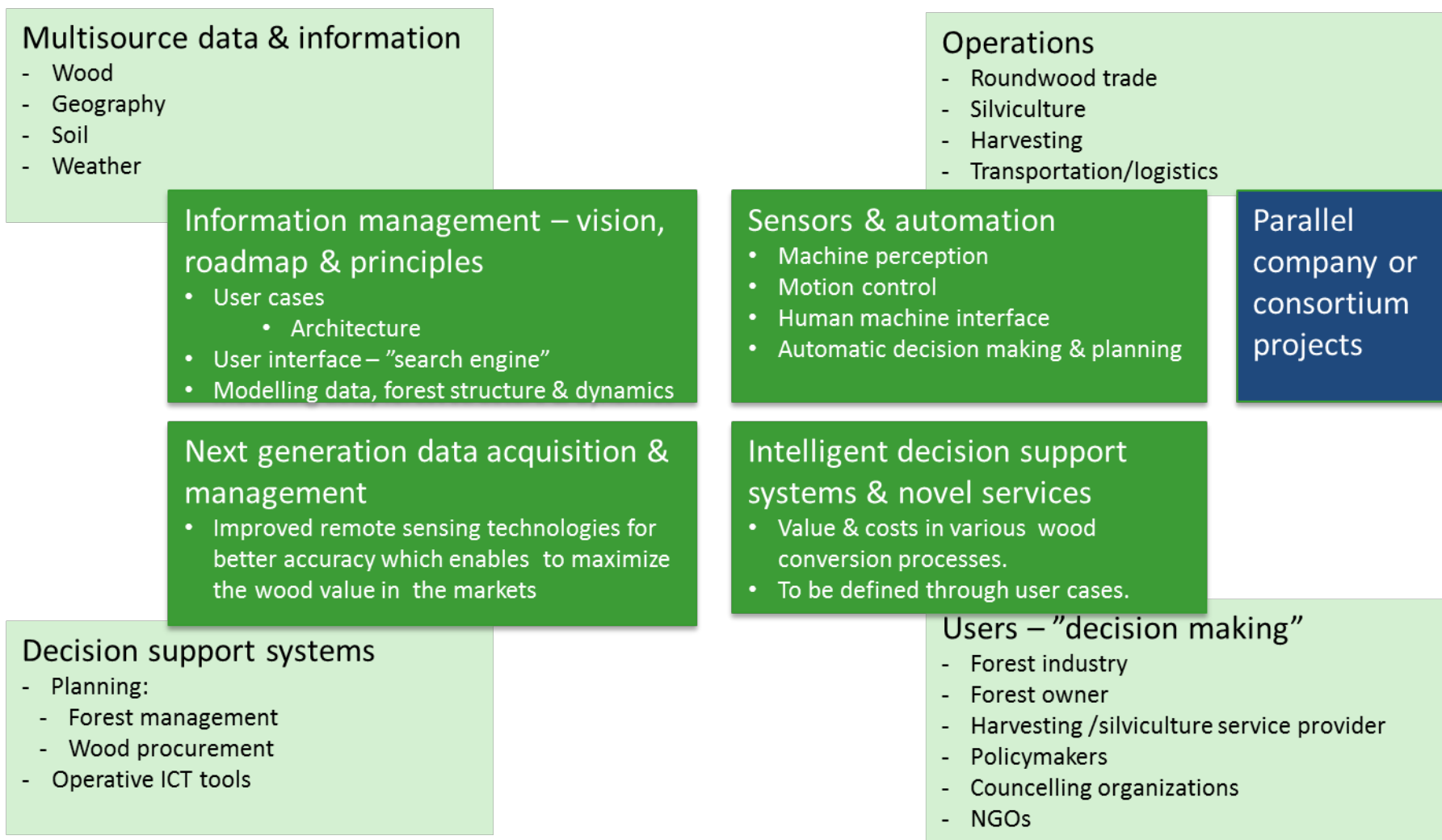
Forest IT program (Jari Hynynen, Metla)

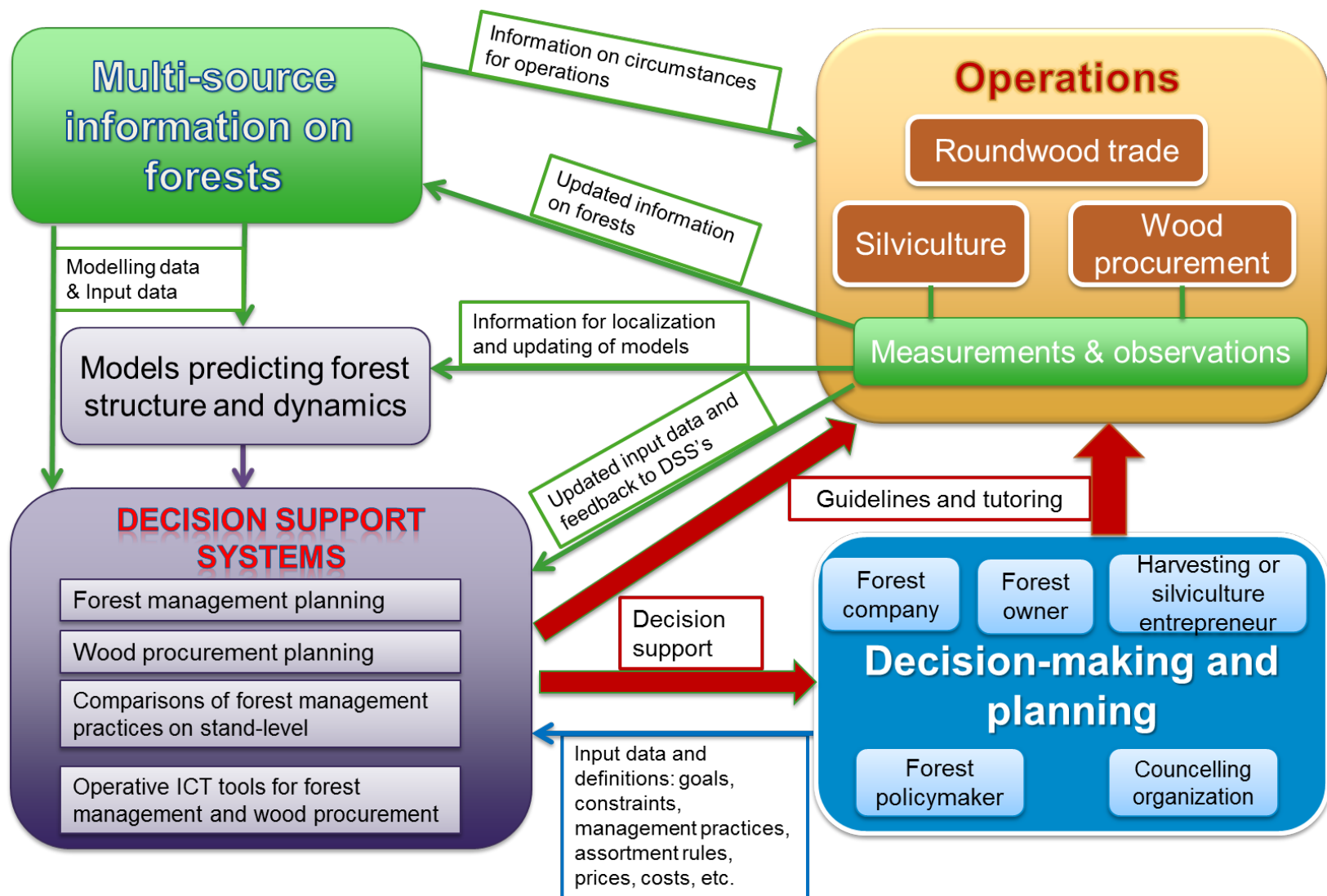


2.5.2013 Markku Leskelä & Pauliina Tukiainen

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FOREST BIG DATA - Program Scope





(Jari Hynynen, Metla)

Observe also this attempt to become: European level symposium in April 2016



Symposium on **Wood Products Industries in Future Bio-Economy Business**

April 7-8, 2016, Sibelius Hall, Lahti, FINLAND



Symposium on **Wood Products Industries in Future Bio-Economy Business**

Symposium highlights

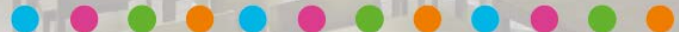
- the importance of wood products and woodworking industries in the European bio-economy
- new opportunities for business, markets, products, services and wood design
- wood products industries in the EU policy and research programmes
- networking at the European level between decision makers of wood products industries, society, policy and research funding

The first day consists of presentations given by leading European bio-economy and wood products industries experts, followed by an interactive panel discussion. In the second day, the participants are invited to discuss, plan, and network to produce ideas for further collaborative actions.

More information: www.luke.fi/rdisymposium2016/

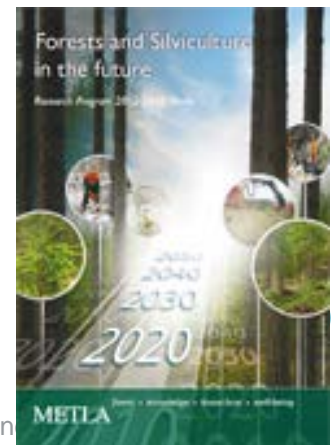
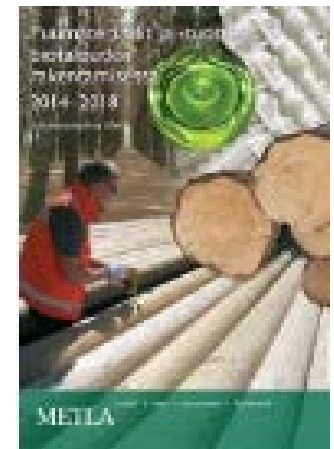
Welcome to the Symposium!

Main organizer:
Natural Resources Institute Finland (Luke),
Wood Materials and Products in the Development of Bio-Economy
Research, Development and Innovation Programme



ECAMOB-relevant research, development and innovation programmes of Luke

- * New forest and forest biomass based products and services (NEW, 2013-2018)
- * Wood materials and products in the development of bioeconomy (MAT, 2014-2018)
- * Forest energy 2020 (2012-2016)
- * Future forests and silviculture (MHO, 2012-2016)
- * Forest Sector Foresight (MTU, 2012-2015)



Wood Materials and Products in the Development of Bioeconomy 2014-2018

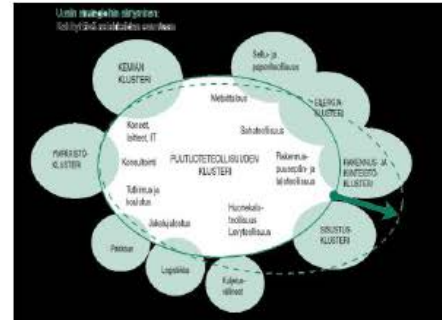
The objectives of the RTD programme are:

- to create a foundation for knowledge and expertise on which Finnish bioeconomy can be built,
- to analyze new business opportunities for wood products cluster in bioeconomy
- to add to the competitiveness of the entire forest and wood products cluster value chains

by providing knowledge of the future's wood-based raw materials, product demand and customers requirements. models.

Themes

- Wood product cluster in bioeconomy
- Wood utilization
- Wood-based raw materials
- Wood measurement
- Genetics and wood quality



Wood Materials and Products in the Development of Bioeconomy

Thematic structure

Research of fundamentals: knowledge innovations, development of expertise

Development projects, problem solving, customer service: applications, added value, promotion of wood product cluster



Wood utilisation

- Product properties and their improvement
- New products and uses
- Building and living with wood
- Demand and markets
- Profitability and competition ability



Wood-based raw materials

- Future's raw material basis and cultivation forestry
- Side streams of wood product industries and their utilisation
- Markets for raw materials, added value, growing for quality



Wood measurement

- Novel measurement, grading and sorting methods of wood-based raw materials
- Novel measurement methods of product properties
- Versatile implementation of measurements and efficient utilisation of resulting information



Genetics and wood quality

- Basis of genetic variability and potential of genomic breeding of wood properties
- Measurement and utilisation of genetic variability of wood properties
- Relationship of genetic origin and silviculture with wood quality
- Economic effects of tree breeding toward wood quality



Wood product cluster in bioeconomy

Foresight – Business innovations – Resource efficiency – Recycling and material flows – Environmental competence – Life-cycle analysis

Luke is actively seeking international collaboration to carry out joint projects in the fields of the program!

For further information, please contact:

Professor Erkki Verkasalo, Programme Director

Dr. Riitta Hänninen, Wood products cluster in bio-economy

Dr. Henrik Heräjärvi, Wood utilisation

Prof. Erkki Verkasalo, Wood based raw materials

Mr. Jari Lindblad, Wood measurement and scaling

Prof. Katri Kärkkäinen, Genetics and wood quality

<http://www.luke.fi/ohjelma/mat/>