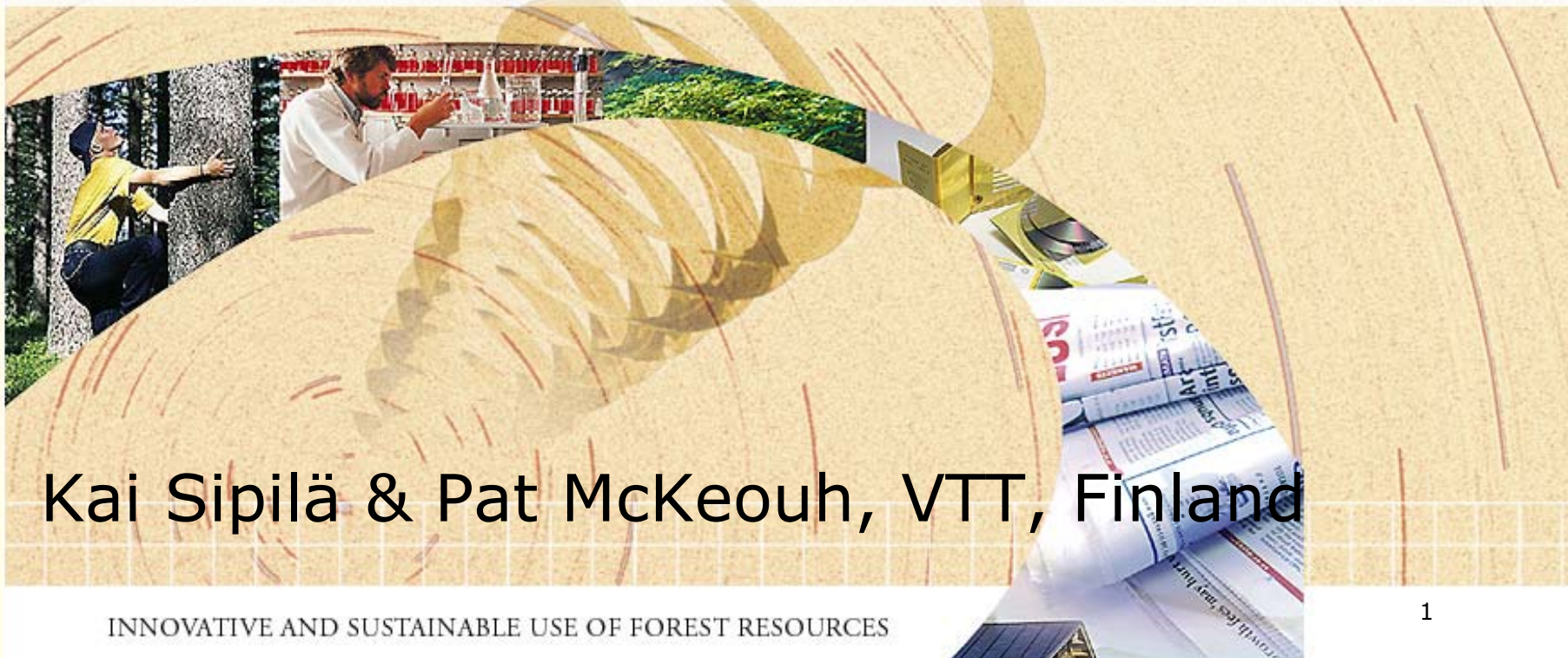


Forest-Based Sector
Technology Platform



The FTP Strategic Research Agenda

Value Chain: Bio-Energy



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Value-Chain Domain

- On-site production of energy from forest-based biomass
- Production of upgraded power and biofuels (products); preferably co-production at pulp and paper mills

Not included: procurement of forest biomass for energy purposes → Forestry Value Chain

Key Challenges and Opportunities

Key Challenges:

- Helping society to mitigate climate change and to secure energy supply
- Providing energy products in response to societal needs, at the same time generating more profit for the sector

Key Opportunity:

- Becoming Europe's largest producer of both green electricity and transportation biofuels



Research Themes Submitted for SRA

- Reducing the share of fossil fuels in the fuel slate of the forest-products industry
- Improving technologies for the production of heat and power from forest-based biomass
- Producing transportation biofuels
- Improving utilisation of low-grade fibre-containing wastes
- Identifying pathways for optimal sustainable development of the sector through systems analyses



Incorporation of Research Themes into SRA

- ⦿ Reducing the share of fossil fuels in the fuel slate of the forest-products industry
 - ⦿ Improving technologies for the production of heat and power from forest-based biomass
 - ⦿ Producing transportation biofuels
 - ⦿ Improving utilisation of low-grade fibre-containing wastes
 - ⦿ Identifying pathways for optimal sustainable development of the sector through systems analyses
- combined into one Research Priority**
- independent Research Priority**
- imbedded into P&P Research Priority**
- used as basis of two Research Priorities across Value Chains**



Research Priorities

Bio-Energy Value-Chain Research Priorities

- Major improvements in on-site bio-energy conversion and production
- Production of transportation biofuels from biomass residues

Cross-Sector Research Priorities

- Development of sustainability impact methods, tools and their applications
- Policy analysis and implications

Major improvements in on-site bioenergy conversion and production

Why

- ⦿ Major technological developments in this area will increase the end-consumption of bio-energy and so will enhance the sustainability of European society
- ⦿ Forest-based residues include residues from forestry operations, black liquor, bark, sludges, rejects from fibre-recycling,....

What outcome

- ⦿ The outcome will be a capability to implement vastly improved on-site bio-energy systems utilising components like:
 - ⦿ novel and compact processes for conversion of forest-based residues: on-site utilisation in existing oil-fired or gas-fired equipment or export of excess bio-energy
 - ⦿ Highly advanced recovery boilers and multi-fuel fluidised-bed boilers
 - ⦿ Combined-cycle (IGCC) technologies and SNG production processes for both black liquor and solid biomass residues

Production of transportation biofuels from biomass residues

Why

- ⦿ Increasing the share of biofuels in the transportation sector is one of the most important, and most challenging, goals of current EU policy
- ⦿ Advanced processes, such as those based on gasification of forest biomass, could produce biofuels at near-competitive prices, even in today's fuel market

What outcome

- ⦿ Competitive processes for the production of second-generation transportation biofuels from forest-based biomass residues
- ⦿ Further enhancement in competitiveness by integrating the conversion process into the energy system of a pulp and paper mill
- ⦿ Profit derived from the co-produced biofuel of same order of magnitude as that from the main pulp or paper product

Cross-Sector Research Priorities:

1. Development of sustainability impact methods, tools and their applications

2. Policy analysis and implications

Why

- › The forest-based sector impacts society in various, sometimes conflicting, ways. Systems analyses are needed to determine development strategies which optimally combine a high level of industrial activity with significant environmental and societal benefits.
- › Being based on a renewable resource, the European forest-based sector is in a good position to benefit from EU policies. System analyses are needed to identify the most promising win-win situations and to generate scientific data to avoid sub-optimised long-term policies.

What outcome

- › Refined methodologies and comprehensive data bases for analyses of sustainability impacts
- › Continually updated development strategies for the whole sector; balanced utilisation of forest biomass for materials and for energy
- › Analyses of impacts of EU policies on sector, response strategies

Impacts

Positive impacts on:

- ⦿ Environment – mitigation of climate change
- ⦿ Energy – improved efficiencies, security of supply
- ⦿ Competitiveness – bio-energy products increase profitability
- ⦿ Consumer – satisfaction of demand for green energy products
- ⦿ Society - in addition to environmental and energy-supply benefits (above): waste-management benefits, increased employment,...

Questions for Workshop

- ⦿ Systems analyses of whole sector: have bio-energy dimensions been fully appreciated?
- ⦿ Sufficient co-operation across Value Chains with respect to whole bio-energy production chain: forest → end-use?
- ⦿ Fibre recovery from wastes: importance of energy income in new integrated solutions?
- ⦿ Off-site power and heat production?
- ⦿ Ways to involve stakeholders outside forest-based sector?
- ⦿ Interaction with other EU technology platforms, such as Biofuels for Transport?