Forest-based Sector
Technology Platform

Recommendations

for the Work Programme 2018-2020
of Horizon 2020

Societal Challenge 5

Climate Action, Environment,
Resource Efficiency and Raw
Materials

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2016

SOCIETAL CHALLENGE 5
Climate Action, Environment, Resource Efficiency and Raw Materials

In the scope of SC5, the stakeholders of the forest-based sector have prioritized 30 FTP SRA activities for 2018-2020 (these activities are described in detail in the Annex). Based on these activities, FTP proposes nine "topic themes" in the attached table.

Climate change mitigation is one important ecosystem-service provided by forests and an intrinsic component of the forest-based industries. EU strategies on climate change mitigating should always include forests and the forest-based sector.

Protecting the environment, sustainably managing natural resources, water, biodiversity and ecosystems

Understanding the ecological functioning of diverse European forests is a basic requirement. Forests capture 10% of the EU's CO_2 emissions, host biodiversity at species and gene level, ensure water conservation, mitigate natural hazards, offer recreational opportunities and provide employment in rural areas. Through these services European forests provide great socio-economic value. The challenge is to find the right balance in space and time for providing this palette of benefits.
A better understanding is needed to create a variety of management systems - for everything from strict reserves and semi-natural forests to intensively-managed plantations - using improved silvicultural practice based on advances in functional ecology and genetics.

Ensuring the sustainable supply of non-energy, non-agricultural raw materials

The cooperation under the EIP Raw Materials between the Mining, Minerals, Aggregates and Woodworking sectors are very stimulating and important.
Wood and wood-based products have the potential to be re-used repeatedly as raw material. Waste from harvesting operations and wood processing is regularly used as high-value raw material for other types of processing.
The circular economy requires the collection of residues from harvesting and processing with priority for separate collection and quality assortment classifications.

Enabling the transition towards a green economy and society through eco-innovation

Develop concepts and upscaling to production scale for the manufacture of 100% biobased, recyclable packaging and design approaches for the easy-to-dismantle building components and precise material characterisation to facilitate optimal sorting and recycling

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An increase of new multi-storey biobased buildings would be one of the most economical investments on the path to fulfil EU's commitments under the COP21 Paris Agreement.

Eco-innovation developing nanocellulose as a biobased material substituting non-renewables in lightweight bio-composites for the automotive and transport industry to filler and emulsifier in concrete, paper, soil and food products and contributing to a circular economy.

Table of proposed Call Topics for SC5 in 2018, 2019 and 2020

Proposed Call Topic title	Description and potential impact 5-10 years	Possible participation from other WPs
Protecting the environment, sustainably managing natural resources, water, biodiversity and ecosystems		
Multi-purpose management of forests	A resilient and diverse European forest is sustainably managed by a variety of owners and owner cooperatives who provide all the functions of the forest including raw materials for the circular economy, biodiversity, climate change mitigation and recreational opportunites.	o SC2
Next generation wastewater treatment	o New methods for separation of water soluble molecules from fermentation o Recycling and end-of-life use (cradle to cradle), paving the way to a circular economy.	
Forest-ecology and ecosystem services	New markets for non-wood forest goods & services (berries, clean water, eco-tourism...) is well on its way to reach the 2030 target of a 10-fold increase.	o SC2
Ensuring the sustainable supply of non-energy, non-agricultural raw materials		
Secured wood supply, forest operations and logistics	Sustainable harvesting possibilities in Europe have increased by 30% until 2030 (bearing in mind the full range of demands and production constraints).	o ICT o NMBP o SC2
Resource efficiency, reuse and recycling systems	o Recovery, reuse and recycling of forest-based products account for 70% of all recyclable material. o Making value-added use of the bark which represents around +10% of biomass from a tree.	o SC2
Packaging materials in the circular economy – design for recyclability	100% biobased packaging	o NMBP
Enabling the transition towards a green economy and society through eco-innovation		
Advanced biobased construction for a circular economy	Wood-based construction is becoming a cornerstone of the biobased circular economy, generally credited as low carbon footprint construction.	o Bioeconomy o NMBP
Eco-innovation strategies to increase wood durability – wood impregnation	Green alternatives to banned wood preservatives for long-term durability wood products.	o NMBP

Nanocellulose – new biobased products for the circular economy	o A new renewable, biobased material in the green manufacturers toolbox help to fulfilling the consumer needs of a circular economy. o New renewable materials and their functionalities are characterised using suitable new methods and measuring techniques.	o NMBP
Forest-based textiles for the Circular Economy	Replacing petroleum-based textiles with new cradle-to-cradle circular value chains for biodegradable textiles from renewable, recyclable fibres coming from cultivations that does not require irrigation, pesticides or fertilisers.	

Annex
Stakeholders' priorities for 2018-2020 indexed according the FTP Strategic Research & Innovation Agenda 2020

Stakeholder priorities concluded in the 2016 Prioritization Process (for action in 2018-2020).
The research and innovation activities are organised according the Research Areas of the FTP SRA.

Annex to SC5 priorities

2.4 Secured wood supply, forest operations and logistics – Circular Economy
E. Develop intelligent forest operation systems and new solutions for human–machine–terrain interactions
A. Develop new inventory techniques for determining quantity, quality, dimensions and specific properties of forest resources.

2.5 Raw Material reuse and recycling systems – Circular Economy
A. Generate a better knowledge of useful or harmful chemical compounds in different tree parts and wood biomass fractions for cascading purposes
D. Develop value-added applications of extracted wood polymers, nanofibrils, lignin, xylan, pulp fibres and paper, for example, for carbon fibres or ultra-lightweight composites in the fields of construction, interior design and packaging.
K. Develop new process technologies like separation, fractionation or extraction with improved selectivity for various components in recycling stock which enables a utilisation in value-added applications inside and outside the production chain.
J. Develop innovative sorting systems using new sensors for detection and robotics technologies for paper, wood waste and forest residues to separate according to different types of fibres, inks and fillers, contaminants and soil residues and resulting in higher sorting accuracy and velocity

3.3 Sustainable water stewardship
A. Study the effects of various forest management practices on water use and lifecycle perspective in a context of climate change, ecosystems and biodiversity.
C. Hydrological and hydro-chemical modelling focussing on combined effects of climate change, tree species choice and mixtures as well as management regimes in different geographical settings.
D. Research on quantification of the economic value of the ecosystem service, 'sustainable water supply'
E. Improve separation and cleaning technologies (using physical chemistry and/or industrial bio-technology) for a further closure of water cycles and to reduce the amount of effluent.
F. Develop innovative technologies for the value-added use of separated and extracted components from wastewater treatment.

4.1 Building with wood
A. Identify barriers to sustainable and environmentally-friendly construction and develop further urban building solutions.
D. Develop cost-effective integrated prefabricated timber building systems including hybrid and composite materials
K. Develop advanced wooden structure joints to improve performance and broaden the applicability of wooden structures to substitute for carbon-intensive materials.
F. Develop design concepts taking into account changing building services during the building's lifetime.
G. Improve building physics, indoor air quality and the behaviour of wooden constructions
I. Develop advanced scientifically-justified lightweight wood and fibre-based products, engineered wood products and composite materials with superior performance, low emissions, produced with novel, high quality environmentally-friendly biobased adhesives

M. Develop construction systems and biobased treatments to enhance the long-term durability of high performance wood-based products.

4.2 Indoor environment and functional furniture

F. Develop and establish design criteria to ensure the full recyclability of packaging materials, in particular barrier layers and embedded electronics.

B. Improve the performance of packages and wood- or fibre-based packaging materials, not limited to mechanical properties but including resistance to moisture and microbial contamination, in particular prevention of microbial activity in food packages with the help of shielding gases or active substances

A. Enhance the material efficiency of packaging with, for example, new lightweight construction approaches.

G. Develop concepts and upscaling to production scale for the manufacture of 100% biobased packaging

C. Integrate sensor and information systems in packaging materials – printing applications using functional inks and tags carrying anti-counterfeiting information

4.3 New biobased products

A. Develop new products from wood fibre (nano/microfibrillated cellulose (MFC), nanocrystalline cellulose (NCC), fibre/polymer blends, novel (solvent-free) derivatives, some even with improved thermoplastic properties, etc.)

C. Develop new products from lignin (e.g. chemicals, in composites and as carbon fibre) and hydroxy acids (chemicals and polymers).

G. Develop weatherproof panels, fibre-based insulation materials and wood-polymer composites suitable for exterior use

B. Invent new textile fibre qualities based on cellulose for replacement of cotton fibres in textiles

4.4 Intelligent Packaging solutions

F. Develop and establish design criteria to ensure the full recyclability of packaging materials, in particular barrier layers and embedded electronics.

B. Improve the performance of packages and wood- or fibre-based packaging materials, not limited to mechanical properties but including, for example, resistance to moisture and microbial contamination, in particular prevention of microbial activity in food packages with the help of shielding gases or active substances

A. Enhance the material efficiency of packaging with, for example, new lightweight construction approaches. Explore the applicability of wood- and fibre-based material in medical applications

G. Develop concepts and upscaling to production scale for the manufacture of 100% biobased packaging

About FTP

FTP is the European Technology Platform for the forest-based sector. The long-term strategy of FTP's stakeholders is established in the FTP *Vision 2030* to be implemented through the *Strategic Research and Innovation Agenda for 2020 (SRA)*. Since 2005, FTP has been organising European cooperation across the whole forest-based sector value chain. The FTP network consists of stakeholders organised in 25 National Support Groups; four shareholder Confederations/Associations: CEI-Bois, CEPF, CEPI and EUSTAFOR; and three Research Umbrella Organisations: EFI, EFPRO and InnovaWood. FTP is active in 25 countries.

The EU forest-based sector in figures

- 35% of the EU land area is covered by forests sustainably managed by 16 million forest owners
- The forest-based industries contribute 8% of EU's total manufacturing added value
- The sector supports 3-4 million industrial jobs in the areas of wood processing, transport, machinery, construction, instrumentation, ICT, chemicals and energy
- The woodworking industries employ some 2.4 million workers in 365 000 SME's
- € 81 billion was the total turnover of the European paper industries in 2010
- 70% of Europe's Freshwater repository comes from forest land

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The European hub for research and innovation in the forest bioeconomy

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FTP SHAREHOLDERS:

CEI-Bois CEPF Confederation of European Forest Owners cepi confederation of european paper industries eustafor MANAGING STATE FORESTS RESPONSIBLY