Consultation Document 2.

SRA 2030 Vision – Research & Innovation Activities (RIAs)

List of research and innovation activities to serve the research steps outlined under each Vision Target

This compilation includes Research & Innovation Activities found in the current FTP SRA 2020 (re-ordered to fit into the proposed structure of SRA 2030 which focus on the Vision Targets and proposed Steps towards the Vision Targets)

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- Developing advanced biofuels and more efficient production technologies
- Integrated and holistic energy systems for the circular economy
- Finding optimal balance in energy and fuels production
VT1 Sustainable forest management, biodiversity and resilience to climate change

Functional diversity in biomass production and provision of other ecosystem services

2.2 A. Improve understanding of the complex system dynamics of forests in relation to human society and global change, considering non-linearity of processes, threshold phenomena, feedback and feed forward loops, resulting in alternative stable states; derive improved concepts of resilience to disturbances and adaptive capacity.

2.2 C. Improve the understanding of biodiversity development (both intraspecific genetic diversity and species diversity, including aboveground and belowground food webs) in managed forests, and the role of biodiversity for the production and variety of raw materials, prevention of pests and diseases, water quality and water-related services, soil protection, carbon sequestration and other eco-system services.

Forests’ key role in water supply at regional and continental water supply

3.3 A. Study the effects of various forest management practices on water use and lifecycle perspective in a context of climate change, ecosystems and biodiversity.

3.3 B. Eco-climatological research on the effects of forests on rainfall patterns on a continental scale.

3.3 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.

Strengthening Climate Smart Forestry

1.1 G. Assess the climate change mitigation effects of competing usages of forest biomass including comparative analysis with similarly-applied agricultural products, competing land uses and policy-regulated versus free market developments.

1.1 H. Understand and monitor the role of forest ecosystems and ecosystem management, including soils, for the global carbon cycle.

1.1 I. Assess challenges and further develop opportunities for specific European trans-boundary forest ecosystems in times of global change.

1.1 J. Assess and monitor global developments in total forest cover and ecosystem services, raw material supplies and their potential to mitigate climate change.

1.3 E. Devise a more cost-effective EU and national policy framework for climate change mitigation by propagating the means of sustainable forest management, increased use of wood as well as wood-based products for systematic cascading.

2.1 B. Research into regionally and locally specific forest management regimes that are able to cope with climate-change and at the same time fulfil local and global needs.

2.1 H. Multidisciplinary research within the scope of an integrated landscape concept.

2.3 B. Improve existing and develop new techniques for silviculture and efficient forest management systems to reduce vulnerability to climate change including changing fire and storm patterns.

2.3 J. Translate scientific information into a risk-management framework for resource managers.

Improving the partnership with citizens
1.2 A. Raise public awareness of the role of forest biomass and forest-based products in climate change mitigation.
1.2 B. Strengthen citizens’ knowledge of the role of forest-based industries in a biobased society.
1.2 C. Monitor emotional and fact-based societal perceptions of forest management practices, reused and recycled wood-based products, bio- and nanotechnology and its derived products.
1.2 D. Improve decision-making processes and knowledge transfer systems by taking into account both scientific knowledge and citizens’ perceptions (including civil society, customers, forest managers and policymakers).
1.2 E. Monitor and predict shifting societal demands including scenarios for future priorities in raw material use, forest management and ecosystem conservation.

Streamlined forest governance to foster forest-based benefits for the society

1.1 C. Provide an overall economic valuation method for all products, employment, and ecological and common welfare services of the forest-based sector compared to other sectors at national and European level.
1.1 F. Build up forest-related data infrastructures on existing pan-European and national monitoring networks in order to extract maximum benefit from earlier investments and already-compiled data series and knowledge. European efforts should be linked with the Global Forest Information Service (GFIS) initiated by the International Union of Forest Research Organizations (IUFRO) and the United Nations.
1.3 A. Develop effective assessment and communication tools to inform political decision-makers about evaluation of forest ecosystem services compared to other land uses.
1.3 F. Develop impact assessment tools for policies affecting the forest-based sector, especially those addressing changes in land use, energy production and energy saving. Also, with regard to recycling and cascading use of biomass.
1.3 H. Assess and address the direct and indirect effects of policy approaches, political incentives, development of sector relevant standards and regulations, market developments, and changing societal perceptions and demands on the forest-based sector.

2.1 A. Research into the trade-offs between multiple technical, biological and value-based functions both on small and large spatial scales, to form the basis for socially and environmentally optimal new management regimes.
2.2 B. Create a new and better-linked research and information infrastructure including integration of space data, monitoring networks and a harmonised database infrastructure.
VT2 Increased, sustainable wood production and mobilization

Digital revolution in decision and production support for precision forestry

1.1 E. Explore new space technologies to generate forest-related data, including high resolution space data, LIDAR-, IR- and radar data and to present those data layers together with relevant trade and climate change data.

2.3 A. Improve monitoring, empirical modelling and space technology tools for assessing forest growth and biomass production trends on different spatial and temporal scales.

2.3 C. Develop decision support tools to help forest managers optimise growth, resource efficiency and water productivity in changing environmental conditions.

2.4 A. Develop new inventory techniques for determining quantity, quality, dimensions and specific properties of forest resources.

2.4 C. Develop flexible planning and decision support tools for obtaining sustainable wood supply from multipurpose forest landscapes.

2.4 D. Provide new and cost-efficient techniques to allow for chain of custody assessment.

2.4 F. Develop new (or adapt existing) ICT solutions for new, smart and integrated transport and logistics systems from local and regional to global scale.

2.4 G. Develop decision support systems for optimised supply chain management, including cascade use of wood, fibres and biomass, linked to forest planning tools for multifunctional forest management.

Forest propagation material to improve resilience and productivity

2.3 D. Develop new tree breeding strategies that include quantitative and molecular genetic tools aiming at sustainable and high yield of biomass, improved wood quality and resistance to stress.

2.3 E. Develop tailor-made biomass production systems for specific uses.

2.3 G. Develop new, innovative technologies for mass propagation of seedlings.

2.3 H. Develop new tools to carry out performance and risk analysis for novel varieties or genotypes including exogenous genetic resources introduced in regions different from their origin.

2.3 I. Assess the economic, social and environmental benefits and risks associated with the use of genetically-improved trees.

Novel technologies and automation in forest operations

- improved automation in seedling planting and stand tendering
- high-yield and environmentally friendly operating systems for harvesting, sorting and further transport
- effects on productivity and quality after clearing, thinning and selection cutting

2.4 E. Develop intelligent forest operation systems and new solutions for human–machine–terrain interactions.

- Optimized, efficient harvesting with reduced impacts on ecosystem
- Safety in forestry operations, e.g. rescue chains
- Automation, e.g. remotely controlled harvesters, unmanned tracks and drones
Measurement and calculation technology for automation and increased-value exploitation, digital mapping layers and driver support
High-yield and environmentally friendly operating systems for harvesting, terrestrial and further transport
Integration of harvesting, preparation and efficient handling of the various parts of a tree, transport flows and subsequent industry processes
Technology for the separation of various biobased raw materials
Develop human-robot collaboration for harvesting operations and for bringing logs to roadside to improve safety, productivity and working conditions
Develop efficient technology for low soil impact, to minimise rutting and increase accessibility to wood resources where soil-bearing capacity is limited
Develop integrated ICT and big data solutions for human-machine-terrain interactions to increase automation in forestry operations and terrain transportation to roadside that improve working conditions, productivity, and safety

Future forest-based product markets and material flows
- impacts of the governance framework on market development
  1.1 A. Assess and develop scenarios for the availability and valorisation of forest-based raw materials in Europe in the global context under changing economic, social and climatic conditions.
  1.1 B. Develop assessment tools and monitoring systems for international production and trade flows including storage and CO2 sequestration in forest-based raw materials and wood-based products.
  1.2 F. Predict future demands through quantitative and qualitative behavioural economics.
  1.3 D. Improve understanding of trade-offs between policies supporting primary wood-based energy production and those supporting the material use of wood in the woodworking and construction industries, pulp and paper industry, biochemical and biomaterial industry
  1.3 G. Assess and communicate the prerequisites and means to increased building with wood and living with wood all over Europe.
  2.4 B. Assess the future availability of woody biomass for different uses.
  2.4 H. Assess market mechanisms, organisational systems and organisational behaviour to improve supply chain management systems.
  3.5 B. Develop foresight methodologies to predict market changes and consumer behaviour and create business models that target evolving consumer needs and behaviours.

Empowering small-scale forest owners
- factors relevant in motivating landowners to engage in forest management, efficient collaboration, and biomass mobilisation
- effective use of digital technologies to provide knowledge to and support forest management activities by small scale forest owners
- adapted forest advisory services in AKIS (Agricultural Knowledge and Innovation System)
  1.3 B. Analyse and monitor changes in forest ownership and their implications for forest management, new opportunities and markets.
  1.3 C. Develop incentives for small-scale private forest owners to actively manage forests for wood production and other new services.
  2.1 D. Try out new business models to activate small forest owners to improve their long-term social and economic sustainability.
2.3 K. Improve sustainable short-term rotation management schemes for woody biomass production.
VT3 More added value from non-wood ecosystem services

Improving business opportunities for non-wood forest products

2.1 G. Develop regulatory instruments to compensate for non-marketed goods and services.
2.1 F. Quantify the total value of forests and their functions.
2.2 D. Investigate and monitor the heritage value of high biodiversity forests in Europe, including key relics in biodiversity hotspots, ancient woodlands and virgin forests.
2.2 E. Develop criteria and indicator tools to quantify ecosystem services, identify their trade-offs, estimate the value of socio-economic benefits and assess the social and human impacts of rural, urban and peri-urban forests.
2.2 F. Improve insight into the value of environmental services to society in an integrated land use setting and analyse efficiency of various financial incentive systems and instruments for enhanced provision of these, including payment for ecosystem services (PES) and PES-like schemes.
3.3 D. Research on quantification of the economic value of the ecosystem service, ‘sustainable water supply’.
3.5 A. Develop new concepts for economic evaluation of ecosystem services, externalities and marketing as well as advanced business models incorporating potential climate change impact in management decisions.
3.5 G. Research new business models between local communities of forest owners, forest operators and industries for the creation of new value chains.

Enhanced value creation by other ecosystem services

2.1 G. Develop regulatory instruments to compensate for non-marketed goods and services.
2.1 F. Quantify the total value of forests and their functions.
2.2 D. Investigate and monitor the heritage value of high biodiversity forests in Europe, including key relics in biodiversity hotspots, ancient woodlands and virgin forests.
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3.5 G. Research new business models between local communities of forest owners, forest operators and industries for the creation of new value chains.
Forest-based benefits for urban and peri-urban societies

- managing forests with dedicated recreational zones close to agglomerations
- urban-rural interdependency
- financing instruments and business cases

– Impact of urban trees and forests on health and well-being of urban citizens under new climate conditions
– Peri-urban forests and their impacts on regional climate in adjacent cities
VT4 Towards a zero-waste, circular society

Increasing material recovery by efficient detection, sorting and separation

3.4 F. Extend the use of bark, harvesting residues and other side-streams to make woodworking and other products.

2.5 A. Generate a better knowledge of useful or harmful chemical compounds in different tree parts and wood biomass fractions for cascading purposes (bioenergy, biorefinery and wood products).

2.5 B. Develop further improvement for the collection of residues from harvesting and processing (paper, construction materials, waste wood, forest residues, pruning residues from agriculture, etc.) with priority for separate collection and quality assortment classifications.

2.5 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.

3.4 G. Develop concepts for turning recycled, solid wood products into fibre and other high-value products.

4.5 E. Develop and establish design criteria to enable recyclability of relevant product categories and methods for the safe disposal of non-recyclable materials.

Reuse and recycling technologies adapted to complex, durable products

2.5 E. Improve the re-usability and recyclability of wood composites and construction material.

2.5 M. Create radical innovations for the removal of inks from paper by easy-to-remove new inks and adopted printing technologies as well as by breakthroughs in deinking technology.

2.5 N. Boost and reactivate properties of recycled fibres (e.g. functionalisation) to enhance pulp and paper properties using new additives (e.g. nanofibrillated cellulose) and technologies.

3.1 D. Develop product design approaches for the reusability of packaging or easy-to-dismantle building components and precise material characterisation to facilitate optimal sorting and recycling.

4.4 F. Develop and establish design criteria to ensure the full recyclability of packaging materials, in particular barrier layers and embedded electronics.
4.6 E. Develop design concepts for ensuring recyclability of hybrid products and technologies for the separation and reuse of used material components.

Developing and integrating methods for assessing and optimising cost and benefits in recycling

1.2 C. Monitor emotional and fact-based societal perceptions of forest management practices, reused and recycled wood-based products, bio- and nanotechnology and its derived products.

1.3 F. Devise a more cost-effective EU and national policy framework for climate change mitigation by propagating the means of sustainable forest management, increased use of wood as well as wood-based products for systematic cascading.

2.5 C. Develop and implement new socioeconomic and policy formulas for fostering stakeholder and societal awareness of the importance of cascade use.
VT5 Efficient use of natural resources

Energy use and efficiency of current and future, multiproduct production sites
3.1 E. Develop production technologies with significantly optimised energy efficiency and energy management in defibration of wood, drying of sawn timber, production of panels, paper and board or in transportation.

3.2 F. Adopt a cascading biomass-based added value approach, maximising value of by-products to fast-growing green energy markets (links to RIA 1.3 and 2.5).

Intelligent use of wood raw material
3.1 C. Demonstrate and integrate new papermaking technology (e.g. stratification) that allows increased use of recycled fibre at lower grammage.

3.1 H. Use information and communications technology (ICT) to meet highest process efficiency, improving material flow, resource efficiency, process stability, machine productivity, etc.

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

4.3 E. Develop products based on wood extractives, including chemicals but also products based on the bioactivity of the forest-based components (used for protection of woodworking products, as food ingredient or even as pharmaceuticals).

3.4 B. Demonstrate improved pulping processes (link to RIA 3.1).

Using Less water per produced ton of product
3.3 E. Improve separation and cleaning technologies (using physical chemistry and industrial biotechnology) for a further closure of water cycles and to reduce amount of effluent

3.3 J. Integrate new technologies in existing process water systems in order to further improve optimal water use.

3.3 F. 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.

3.3 K. Ensure or enhance the microbiological stability of industrial water systems.

Leftower RIAs
4.3 F. Develop more advanced products from traditional fractions, such as tall oil and turpentine.
3.4 D. Develop separation technologies applicable in the forest-based industries and more specifically, demonstrate concepts for the separation of valuable components from pulping spent liquors.

3.1 F. Develop enhanced separation and fractionation technologies for material components to enable their optimal use in layered or composite structures.

3.3 G. Develop innovative technologies for the value-added use of separated and extracted components from wastewater treatment.
VT6 Diversification of production technologies and logistics

Industrial symbiosis

4.2 M. Develop biobased, material efficient 3D components, e.g. for furnitures and similar sized components.

3.5 F. Conduct standardisation and pre-normative re-search in ICT applied to the forest-based sector for improving information exchange, business-to-business models and consumer perception and interaction.

3.5 H. Create business models based on opening up the raw material pool and conversion of traditional mills to new markets.

3.4 H. Develop combinations of mechanical, thermal, chemical and/or biochemical technologies for biomass deconstruction or fractionation and processing, laying the ground for new biorefineries producing novel materials for further upgrading.

3.4 E. Develop new biorefinery concepts using the sawmill as the starting point.

3.3 H. Invent new concepts for the re-use of treated water, for example, industrial symbiosis

Adopting additive manufacturing technologies and new production methods

3.5 E. Develop ‘emotional’ computer applications for shopping experiences and IT integration on cognitive influences and rational decision-making processes. Create virtual environments for controlled simulation of the effectiveness of shopping experience.

Improving traceability and chain-of-custody throughout the value-chain

2.4 D. Provide new and cost-efficient techniques to allow for chain of custody assessment. See 6.1

2.4 H. Assess market mechanisms, organisational systems and organisational behaviour to improve supply chain management systems.

3.5 B. Develop foresight methodologies to predict market changes and consumer behaviour and create business models that target evolving consumer needs and behaviours.

Autonomous and/or electrified transportation systems

2.4 F. Develop new (or adapt existing) ICT solutions for new, smart and integrated transport and logistics systems from local and regional to global scale.
VT7. Purposeful, safe jobs and links between rural and urban regions

Related RIAs

Adapting job offers to an era of Artificial Intelligence

2.4 I. Develop innovative processing concepts to be carried out during transport

Creating job opportunities through economic incentives for management of small forest ownerships

1.3 B. Analyse and monitor changes in forest ownership and their implications for forest management, new opportunities and markets.

1.3 C. Develop incentives for small-scale private forest owners to actively manage forests for wood production and other new services.

2.1 D. Try out new business models to activate small forest owners to improve their long-term social and economic sustainability.

Creative jobs growing the forest-based sector

RIAs missing

New market places and jobs in response to changing consumer trends

1.1 C. Provide an overall economic valuation method for all products, employment, and ecological and common welfare services of the forest-based sector compared to other sectors at national and European level.

1.3 I. Assess and address the direct and indirect effects of policy approaches, political incentives, development of sector relevant standards and regulations, market developments (RIA 1.1), and changing societal perceptions and demands (see RIA 1.2) on the forest-based sector.
VT8. Renewable building materials for healthier living

Performance, resource efficiency, environment friendliness, durability, and price optimisation of biobased construction

2.5 F. Develop systems for wooden buildings allowing for easy dismantling and remounting.

2.5 G. Develop environmentally-friendly additives and impregnating agents for wood products.

2.5 H. Develop solutions for the utilisations of used wood from construction operations (scaffolds, concrete casting moulds) as a biorefinery raw material.

4.1 D. Develop cost-effective integrated prefabricated timber building systems including hybrid and composite materials.

4.1 F. Develop design concepts taking into account changing building services during the building’s lifetime.

4.1 G. Improve building physics, indoor air quality and the behaviour of wooden constructions, especially in low-energy houses.

4.1 K. Develop advanced wooden structure joints to improve performance and broaden the applicability of wooden structures to substitute for carbon-intensive materials.


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

4.2 H. Develop new application systems for water-based and powder coatings.

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

4.3 H. Improve existing, long-lasting adhesive systems for flake boards, medium density fibre board (MDF), oriented strand board (OSB) and plywood boards as well as for glulam by using ingredients which are not based on fossil resources and are free of emissions (e.g. adhesive systems based on renewable resources).

Improving industry, consumer (user), and policy decision-makers’ perceptions of biobased construction materials, products, structures, buildings and services (including standardisation)

1.3 H. Assess and communicate the prerequisites and means to increased building with wood and living with wood all over Europe.
3.5 C. Develop strategies for marketing dwellings and houses and after-sales services taking into account consumers' expectations and preferences for building with wood.

3.5 D. Develop new business tools and interfaces to interact with consumers of final products and the do-it-yourself home improvement segment.

4.1 A. Identify barriers to sustainable and environmentally-friendly construction and develop further urban building solutions.

4.1 B. Harmonise building standards in Europe.

4.2 B. Clarify the role of wood and wood-based products in securing good indoor environments and contributing to perceived comfort.

4.2 C. Further develop the multi-material concepts and multi-functionality for wood and wood-based products in interior fittings, furniture and everyday products.

4.2 D. Develop indoor system solutions that promote flexibility regarding changes in use (ageing in-habitants, changing family structures, growing children) (see RIA 4.1).

Increase the understanding and enhance the communication of positive health aspects, advanced solutions for ambient assisted living and overall ergonomics, and general adaptability of the biomaterials-based living environment

4.1 E. Investigate human wellbeing, operational safety, structural quality and energy efficiency in wooden buildings.

4.1 J. Develop solutions with superior thermal and ventilation properties, positive health effects, resistance to moisture and microbial attacks in wood-based, fibre-based or ecologically-treated insulation materials and systems.

4.2 E. Study factors that influence people’s appreciation of the aesthetics of wood, especially in interior furnishings and identify barriers preventing greater use of this sustainable and environmentally-friendly product.

4.2 F. Develop environmentally-friendly multifunctional varnishes and lasuring coatings with micro-encapsulations (aromas, biocides, UV filter absorbents and fire retardants).

4.2 L. Combine superior material properties of wood with high-level design and a segmented marketing approach (see RIA 3.5).
Informatisation of construction with renewable materials, their reuse in multiple life cycles, and all aspects of living in biomaterials-based living environments

4.1 C. Integrate information and production technologies in design and building information models for new generation wooden houses.

4.1 H. Develop advanced non-destructive measurement systems for quality prediction and quality control in wood in construction and in wooden structures.

4.1 N. Given the functional requirements imposed on the respective products, develop methods to match the lifespan of wood to that of other construction materials (holistic approach, risk of failure, lifecycle costs, lifecycle planning, strength and sustainability analysis).

4.2 A. Develop technological designs for moisture-controlled use of wood and wood-based products in buildings’ weather barriers in different climatic conditions. Use of sensors for monitoring and control (see RIA 4.1).

4.2 G. Develop intelligent furniture surfaces (integrated sensors and electrical conductivity) and use a ‘learning from nature’ approach towards state-of-the-art surface qualities, durability and mechanical properties of wood-based materials.
VT9. New fibre-based products and 80 per cent lower CO2 emissions

Add value and provide customised solutions to markets

3.1 G. Devise functional surface treatments such as layered curtain coating, including nanofibrillated cellulose, chemical grafting (chromatogeny) and surface activation (plasma) to enable bulk material reduction, enhance durability or extend life.

4.4 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.

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

4.4 D. Develop tools to safeguard the reliability and usefulness of embedded information systems in different packaging chains and to monitor the history and performance of different packaging solutions.

4.5 C. Develop production concepts of layered tissue products with multi-layer properties.

4.5 D. Develop concepts to monitor dryness of hygiene products like nappies and to acquire diagnostic data via embedded intelligence and communicating functions in tissue products.

4.5 A. Develop methods to improve softness and strength of tissue products.

4.6 A. Investigate consumer perception and trends in the use and the acceptance of features based on combined electronic and printed media.

4.6 B. Develop high-precision paper substrates and surfaces that enable the printing of electronics and safeguard their functionality and durability.

4.6 D. Develop smart and intelligent features for applications based on printed electronics or printed biosensors, e.g. in packaging.

4.6 F. Develop business concepts that exploit the advertising possibilities of the integration of printed and electronic media, and use shopping features to print media products by direct connection to internet shopping sites.

Develop novel and sustainable wood and fibre valorisation routes

2.5 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.
4.3 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.).

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

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

4.3 D. Develop hemicellulose-based products, in which the hemicellulose is utilised especially as an oligomer or as a polymer (e.g. chemicals, films).

4.3 I. Study new materials generated by novel wood fractionation technologies (see RIA 3.4).

4.3 K. Develop new industrial value chains starting from sugar solutions, based on fermentation or other means to upgrade the sugars (see RIA 3.4).

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

4.5 B. Enhance the microbial safety of different fibre raw materials.

4.5 G. Explore the applicability of wood- and fibre-based material in medical applications.

Boost the circularity credentials of forest industries

2.5 I. Establish criteria for eco-design of graphic and packaging paper products for an optimised recyclability and a material cascading towards zero waste

2.5 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.

3.4 K. Demonstrate concepts converting recycled/waste fibres into fermentable sugar solutions
VT10 sorting of RIAs under steps

Developing advanced biofuels and more efficient production technologies

3.4   I.  Demonstrate novel concepts based on gasification, producing as an intermediate product, clean synthetic gas (‘syngas’).

3.4   J.  Demonstrate novel concepts based on flash pyrolysis, producing as a first or intermediate product pyrolysis oil (‘bio-oil’).

4.3   J. Upgrade syngas and bio-oil into transportation fuels and further into chemicals and polymers (see RIA 3.4).

3.2   E.  Develop a production platform for various drop-in fuels for road, aviation and marine transport.

Integrated and holistic energy systems for the circular economy

3.2   D.  Demonstrate new, large-scale combined heat and power (CHP) installations, higher efficiency and power-to-heat ratio in multi-fuel fired power plants.

3.2   B.  Engineer new technologies to increase energy production and reduce energy consumption.

3.4   C.  Develop concepts for turning the wastewater treatment plant into an energy-producing entity.

3.3   I.  Engineer new concepts for heat recovery from water cycles and their value-added utilisation.

Finding optimal balance in energy and fuels production

1.3   G. Develop impact assessment tools for policies affecting the forest-based sector, especially those addressing changes in land use, energy production and energy saving. Also, with regard to recycling and cascading use of biomass.

3.2   A. Quantify the green energy potential of present production sites including their biomass supply potential.
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