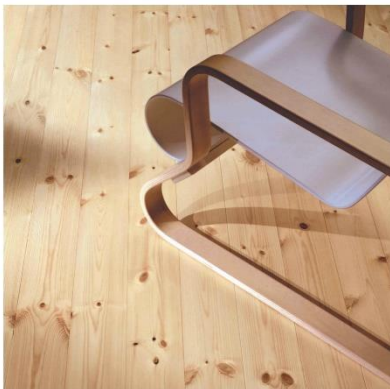


HORIZON 2020 CALL TOPICS 2018–2020

The complete manual for the Call topics relevant for the
forest-based sector

V.1.0 – 11/2017





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Horizon 2020 Work Programme 2018–2020

Following a [release](#) of the Horizon 2020 Work Programmes (WPs) for 2018–2020, the European Commission announced an investment of around €30 billion in research and innovation projects covering the final years of the Horizon 2020 research and innovation funding programme.

Over the three forthcoming years, the Work Programmes aim at leveraging greater impact of research funding by focusing on fewer, but critical topics with the focus on the Commission's political priorities such as climate, the circular economy and digitising the European industry. Moreover, the Commission kick-starts the first phase of the European Innovation Council which is set to mobilise € 2.7 billion from Horizon 2020 to boost breakthrough, market-creating innovation, covering also financial support for SMEs.

This FTP Manual showcases a list of the most relevant Call topics for the forest-based sector. Each Call contains topics and each topic describes the specific challenge to be addressed, the scope of the activities to be carried out, and the expected impacts to be achieved by the projects proposed. The relevant topics selected and compiled in this manual are arranged with the link to the corresponding Research and Innovation Areas of *FTP's [Strategic Research and Innovation Agenda for 2020 \(SRA\)](#)*.

The Horizon 2020 topics 2018-2020 of highest relevance for the sector are clustered under the following four pillars:

- **Industrial Leadership:** Nanotechnologies, advanced materials, advanced manufacturing and processing, and biotechnology (NMBP) & Space
- **Societal Challenge 2:** Food Security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy
- **Societal Challenge 3:** Secure, Clean and Efficient Energy
- **Societal Challenge 5:** Climate action, environment, resource efficiency and raw materials
- **Excellent science:** Research Infrastructures

Note: Some additional Calls in other priorities or pillars are also included.

Note: The Call Topics for 2020 is tentative. The EC has in many cases only published the title of the Call or made a financial reservation for elaboration at a later stage.

Proposals can be submitted electronically through the European Commission's [Research Participant Portal](#). The complete list and description of Calls and further guidance to submit a proposal are also published on the Portal.

Information on the Call Topics in this Manual will also be available on the [FTP Database](#)

Horizon 2020 is the European Union's Framework Programme for Research and Innovation (2014-2020) With its dedicated budget of around EUR 75 billion over seven years, Horizon 2020 is the biggest EU Research and Innovation programme ever.

Budget for 2018–2020

Call topics relevant for the forest-based sector

	Call(s)	Funding (mln €)
Industrial Leadership Pillar		
Nanotechnologies, Advanced Materials, Biotechnology and Production	13 calls	841.60
Space	1 call	8.00
Societal Challenges Pillar		
SC2: Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy	13 calls	194.40
SC3: Secure, clean and efficient energy	9 calls	219.50
SC5: Climate action, environment, resource efficiency and raw materials	11 calls	212.70
Excellent Science Pillar		
European research infrastructures (including e-Infrastructures)	1 call	101.50 (full topic)

Source: [European Commission Research & Innovation Participant Portal](#)

DISCLAIMER: Please be aware that only the officially published Work Programme (WP) text, budget and deadlines should be taken as a reference for any proposal preparation. All applicants should consult the Participant Portal to find the latest version.



H2020 Pillar: Industrial Leadership

INDUSTRIAL LEADERSHIP – Nanotechnologies, advance materials, biotechnology, advanced manufacturing and processing

CALL – Transforming European Industry

Factories of the Future (FOF)

Topic ID and title	DT-FOF-01-2018: Skills needed for new Manufacturing jobs				
Budget	EUR 2 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	CSA Coordination and support Action				
FTP subsector	Pulp, paper & processing - Woodworking				
FTP SRA	No correspondence (education & skills)			FTP relevance	high
					medium
					low

Specific Challenge:

Breakthrough education and training paradigms for continuous training of the existing workforce are needed, that will enable the European industrial workforce to develop new skills and competences in a quick and efficient way. This should put workers, both women and men, at the forefront of innovation and drive industry towards a smooth transition to the use of increasingly sophisticated machines and new technologies.

Advanced Manufacturing, one of the six Key Enabling Technologies (KETs), is a highly innovative sector in Europe. In line with the New Skills Agenda for Europe, there is a need to strengthen human capital, employability and competitiveness for this KET. The Blueprint for Sectoral Cooperation on skills is one of the ten actions in this Agenda. This topic will support the implementation of the Blueprint beyond Additive Manufacturing within several areas from the Factories of the Future priorities.

Scope:

- Identify shortages and mismatches in technical and non-technical skills, knowledge and competences in Advanced Manufacturing (including digital capabilities);
- Map the most relevant existing national initiatives upskilling the existing workforce in order to develop an EU wide strategy;
- Put in place activities related to lifelong learning and granting of qualification for personnel in industrial settings. Develop real case scenarios providing efficient methodologies that can be applied in a variety of industrial areas;
- Innovative and hands-on approaches, including Social Sciences and Humanities (SSH) elements, in upskilling of the existing workforce and attracting more women to the



field, through training activities (including training of trainers) and knowledge management with direct involvement of senior employees. On-site, modular and e-learning education should be offered free of charge for re-use;

- Exchange of information between industry, trade unions, educational centres, national employment agencies at European scale.

Expected Impact:

- Real and measurable steps towards the reduction of identified skill gaps leading to the upskilling of the existing workforce in Europe and, as a consequence, increased innovation performance in the industry concerned;
- At least 15 new job profiles per industrial area analysed, leading to a longer work life for jobholders;
- Close and continuous engagement between relevant industry, trade union, academia, educational centres (including vocational schools) across Europe to stimulate networks in the European Research Area as a whole.



Topic ID and title	<u>DT-FOF-02-2018: Effective Industrial Human-Robot Collaboration</u>				
Budget	EUR 79 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	No correspondence	FTP relevance		high	
				medium	
				low	

Specific Challenge:

Human-Robot Collaboration (HRC) on the factory floor has a high potential economic impact for European industry. Past research to implement HRC in an industrial setting concentrated largely on safety of humans, allowing workers and robots to share working space without fences. Most of the developments started from existing industrial robotic arms, augmenting it with technologies to make it safe for humans to interact with the robot. This has already led to production environments with safe interaction between humans and robots. However genuine collaboration between humans and robots require more holistic solutions encompassing smart mechatronic systems designed to improve the quality of the job performed and to increase flexible production. Such systems have not yet been demonstrated for manufacturing purposes.

In order to move from a structured factory floor where robots work behind closed fences to an open environment with smart mechatronic systems and humans collaborating closely, interdisciplinary research in the fields of robotics, cognitive sciences and psychology is required, also taking into account regulatory aspects. More attention has to be paid to develop novel inherently-safe robotic concepts where collaboration with humans is taken up already in the design phase. In order for effective HRC to be taken up by industry, beyond safety aspects, including ergonomics, adaptability, liability issues, inclusiveness of vulnerable workers, acceptability and feedback from users need to be considered in a holistic way.

Scope:

Proposals need to extend the current state of the art of individual HRC to work environments where robots and workers function as members of the same team throughout the factory.

Proposals should cover two of the following three areas:

- Integration in industrial production environments of novel human-centred designed smart mechatronic systems such as for example soft robotics for high payloads;
- Implementation of novel artificial intelligence technologies capable of massive information processing and reacting in real-time to enable new levels of autonomy, navigation, cognitive perception and manipulation for robots to collaborate with humans in the process;



- Development of methods for robotic hazard assessment and risk management to clarify trade-offs between productivity and safety for mixed human-robot smart devices environments.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

Expected Impact:

- Demonstrating the potential to bring back production to Europe;
- 15% increase in OECD Job Quality Index through work environment and safety improvement;
- 20% reduction in production reconfiguration time and cost.



Topic ID and title	DT-FOF-03-2018: Innovative manufacturing of opto-electrical parts				
Budget	EUR 79 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	2.5 Cascade use, reuse and recycling systems			FTP relevance	high
	3.1 Resource efficiency in manufacturing				medium
					low

Specific Challenge:

Optoelectronics and opto-electrical components involve the interactions of photons and electrons. They are used in parts such as lasers, photodiodes, image sensors, optical amplifiers, modulators, solar cells, embedded optics and light-emitting diodes. Previous research led to rapid developments and new applications in optoelectronics and photonics. However, new processes need to be introduced into production systems. When going into the scale-up phase, many processes need to be adjusted to fit the production of complex, often free-form components. The adjustments include both component specific changes as well as standard process steps. Due to the need to produce large varieties of parts in small batches, process adjustments have to be both rapid and accurate. The equipment for testing, failure analysis and control equipment needs to follow a fast pace of technical advancement, and cover a range of sensors, such as electrical, optical, magnetic and thermal sensors.

Scope:

Proposals need to present a variety of new processes applicable to the production of opto-electrical components, for instance material handling, material strain engineering, patterning, material deposition, assembly, joining and bonding. Furthermore, quality needs to be ensured by reliable sensors throughout the production line. The processes need to include a level of sustainability that allows the final products to be recycled and reintroduced into the value chain.

Proposals need to cover all of the following areas:

- New, flexible, and innovative process chains to handle complex designs that include opto-electrical functionalities;
- Improved sensor equipment for quality control in the different processing steps as well as the final functionality of the component;
- Methodologies for improving quality through high-precision automation using the sensor data, including non-destructive in-process evaluation of material and functional component properties;
- Re-use and requalification of key components and precious materials within the process chain from products at their end of life.



Proposals are expected to include a variety of use-case demonstrations of typical opto-electrical components, in which the robustness of the processing, work piece handling, sensing and the automation approach can be demonstrated.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

Expected Impact:

- 15% yield improvement because of the introduction of new sensor equipment, related metrology and automatic non-destructive control;
- 15% time reduction for reconfiguration of key process tools in a production line due to change of type of component;
- A tangible part (> 10%) of the production cost of the parts should originate from recycled products and materials.



Topic ID and title	<u>DT-FOF-08-2019: Pilot lines for modular factories</u>				
Budget	EUR 106,6 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	IA Innovation action (50 %)				
FTP subsector	Pulp, paper & processing - Woodworking				
FTP SRA	3.1 Resource efficiency in manufacturing	FTP relevance		high	
				medium	
				low	

Specific Challenge:

Rapid changes in a production line require a significant flexibility of reconfiguration. Modular production equipment can create highly adaptable production lines to enable efficient production of small series tailored to customer demands. Previous research has shown that the modularity can be at two levels, either as complete machines with their own interface and material handling system or as interchangeable tool heads. In both cases, the advantage of modularity should be demonstrated by the ease of use and plug-and-produce features allowing for rapid modification.

The functionality of the modules should enable the production of the widest variety of complex products. The modules need to allow rapid physical rearrangements, through either automated processes or manual intervention; and have accessible, secure interfaces in order to be connected to a common data system for production control. The interfacing with the existing hardware and legacy software is another aspect that needs to be covered.

Scope:

Proposals are expected to start from existing test beds that are flexible enough to allow for the introduction of multiple modular process units. Proposals should cover all of the following areas:

- The development of a range of production modules covering several different disciplines such as mechanical cutting tools, thermal processes, laser treatments and additive manufacturing technologies, taking into account safety aspects;
- The integration of comprehensive production management systems, including real-time process control in a reconfigurable line, which includes considerations for data interoperability between modules and process line (including legacy hardware and software);
- Pilot production of different products covering processing technologies and features such as multi-functionality (mechanical, electrical, thermal, optical, etc.), multi materials, and complex shapes.



The production modules could be considered as demonstrators on their own. However, their integration in the pilot line as well as an actual production demonstration with a variety of components or product prototypes should be achieved before the end of the project.

Proposals are expected to cover demonstration activities driven by the industrial community. Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

- At least 15% reduction of time to reconfigure the production line (alternatively 15% reduction in downtime);
- 10% higher resource efficiency due to more suitable processing equipment for customised products;
- Reduction of at least 15% of the overall cost of production;
- Measurable yield improvement from run-to-run for small lot sizes.



Topic ID and title	DT-FOF-12-2019: Handling systems for flexible materials				
Budget	EUR 106,6 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	RIA Research and Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	(3.1 Resource efficiency in manufacturing)	FTP relevance		high	
				medium	
				low	

Specific Challenge:

The handling of soft materials with the involvement of robots remains limited. The control systems of the robot need to be very sensitive, accurate and fast to prevent unwanted irreversible deformations and damages. Further research is needed in order to develop handling devices which are not pre-programmed for one specific task, but are intelligent and universally dexterous. Future robots will have to be able to handle soft products while controlling their level of deformation, e.g. in situations where the objects are being manipulated with multiple contact points. Low-cost robots are essential. New handling technologies for flexible materials will lead to disruptive innovations in textile, paper and food processing, and will support a widespread implementation, in particular by SMEs.

Scope:

In order to automate production processes involving soft and flexible materials. Proposals need to cover both of the following areas:

- Innovative technologies for the handling of the soft and flexible materials such as gripping, moving, positioning, sorting, joining etc. so that it can be included in larger automated production processes. Low-cost and universal dexterity are key concepts;
- System solutions that can manage all product and material related data (size, shape, weight, colour, material composition, defects, etc.), so that their automated handling can be embedded in larger production and process management systems.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.

Expected Impact:

- Demonstrating the potential to bring back production to Europe;
- 15% increase in OECD Job Quality Index through work environment and safety improvement;
- 20% increase in productivity.



Topic ID and title	DT-NMBP-19-2019: Advanced materials for additive manufacturing				
Budget	EUR 20,4 million	Opening date	16 October 2018	Deadline 1	21 January 2019
				Deadline 2	03 September 2019
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	4.3 New biobased products	FTP relevance		high	
				medium	
				low	

Specific Challenge:

Additive manufacturing (AM) is now applied in the processing of most industrial metals, ceramics, polymers and composites, albeit at quite different levels of industrial readiness. The challenge is to develop equipment that allows the additive layer manufacturing of multi-materials items and multi-functional materials (for research, transport including aeronautic, consumer customised goods, communications, biomaterials and energy).

The development of novel materials is a primary challenge in the future development of AM. The challenge is also to use nanotechnologies to aggregate multiple materials within a single process, while improving or expanding their functionality, and enhancing their performance. This may include optical, rheological, mechanical, RF, electrical, magnetic, surface, thermal or process properties, controlled release, durability (accelerated aging and life time prediction) and quality.

Scope:

By combining several materials, proposals should advance the state of the art through the development of ready assembled multifunctional devices. Proposals should demonstrate several simultaneous activities:

- Quantification of improved functionalities, properties, quality and lifespan of fabricated pieces;
- Evaluation of matching materials properties to the production process to enable the joining of dissimilar materials for AM tools;
- Demonstration of a better understanding of the nanotechnology integrated materials properties and manufactures;
- Integration and validation at early stage of the qualification and certification considerations of the materials;
- Joint development with material suppliers and end-users is required for a rapid uptake by industry;
- Modelling, standardisation and regulatory aspects (especially safety and nanosafety) and the process and materials qualification.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.



Expected Impact:

- Improvement of the efficiency, quality and reliability of the product by at least 40%;
- Better use of raw materials and resources with reduced environmental impact and to lower cost by 35% as demonstrated by Life Cycle Assessment;
- New opportunities and business for SMEs across Europe (which are key players in advanced materials research for Additive Manufacturing).



CALL – Industrial Sustainability

Sustainable Process Industry (SPIRE)

Topic ID and title	CE-SPIRE-02-2018: Processing of material feedstock using non-conventional energy sources				
Budget	EUR 97,5 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Non-conventional energy sources, such as microwave, plasma, ultrasound and laser, as well as electrochemical and photochemical processes, have already been applied in process intensification, mainly at lab scale, showing significant improvements in process performance (e.g. improved selectivity, crystal nucleation, reaction speed easing raw material demand) for the benefit of energy efficiency. The processes powered by non-conventional energy sources are suitable for connection to the electricity grid. They allow variable throughputs to better follow market demand and enable leaner production paradigms (e.g. decreased stock, production on demand). Such technologies are suitable for downscaling and continuous processing, where they can also be coupled with real time monitoring allowing a finer control of the transformations.

Scope:

Proposals are expected to develop technologies applying non-conventional energy sources to processes of high industrial interest. The concepts proposed should:

- Show potential for integration in a renewable electricity grid, and consider the relevant limitations (fluctuating nature of the electricity stream);
- Provide significant advantages in terms of resource and energy efficiency, compared to the current state of the art processes (or similar ones, as relevant);
- Provide improved flexibility, working at variable throughputs without major losses in the overall process performance;
- Be applicable to continuous processes and/or show potential enabling the replacement of current batch ones;
- Consider, where relevant, the possibility for containerised and/or mobile (e.g. biomass in situ processing) technologies;
- Consider Life Cycle Assessment proving a reduced environmental footprint;
- Consider replicability and scalability of the proposed concepts.

Activities should start at TRL 4 and achieve TRL 6 at the end of the project.



Expected Impact:

- Allowing for a -30% to +30% energy input within RES fluctuations timeframes, without significant losses in specific energy efficiency;
- Improvement in energy efficiency of 30%;
- Improvement in resource efficiency of 30%;
- Decrease in CO₂ emissions by 40% (without considering the electricity generation and at steady state);
- Decreased OPEX and CAPEX by 15%;
- Effective dissemination of major innovation outcomes to the current and the next generation of employees of the SPIRE sectors, through the development of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programs.



Topic ID and title	CE-SPIRE-03-2018: Energy and resource flexibility in highly energy intensive industries				
Budget	EUR 97,5 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	IA Innovation action (50 %)				
FTP subsector	Pulp, paper & processing				
FTP SRA	2.5 Cascade use, reuse and recycling systems			FTP relevance	high
	3.1 Resource efficiency in manufacturing				medium
	3.4 Biorefinery concepts				low

Specific Challenge:

Energy intensive industries should adapt their production processes and unit operations to increasingly sustainable, but highly fluctuating energy supply. To this end, energy and resource flexibility in the European process industry can be improved through the development of novel processes utilising more efficiently energy streams, heat recovery and raw materials flows with variable properties (including new or modified materials as well as secondary raw materials and by-products). The challenge is to establish synergistic integration at a regional level among different production sectors leading to optimisation of production system as a whole and logistics, especially in terms of the supply of energy and raw materials. This should reduce emissions and environmental impact, while maintaining competitiveness and job security.

Scope:

Solutions are needed for value chain optimisation through energy efficiency considerations in the design phase of manufacturing equipment and processes, collective demand side strategies, and potential integration of the nearby renewable energy sources.

In particular, proposals are expected to develop:

- Innovative production technologies allowing flexibility in terms of raw material, including new, modified or secondary raw materials, and intermediate or final products are expected to be developed. They have, at the same time, to consider quality of the main products and by-products in view of their valorisation through re-use and recycle;
- Novel advanced energy systems, could include new combustion and gasification techniques applied to the highly resource and energy intensive industries have to be developed;
- New developments should clearly indicate how the use of sustainable electrical energy sources, or heat recovery, could enhance energy efficiency and cope with a fluctuating energy input. These actions have to bring a significant impact on the sustainability profile of the process and/or the final products.

Proposals need to consider the following elements:



- Treatment technologies and process integration solutions allowing a significant reduction as well as the valorisation, re-use and recycling of by-products and waste streams (solid, liquids and gaseous);
- System, process modelling and integration (up and down-stream) within the plant operation terms or symbiosis concepts, improving energy and raw materials efficiency and flexibility, and minimising the impact on the environment of the whole value chain. Taking also into consideration optimisation at a plant/system level. The activities have to be supported by a quantitative Life Cycle Assessment.

Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

- Cost reduction of the process of at least 10% through the implementation of a flexible scheme in raw materials, including secondary raw materials, process and product quality specifications;
- Improved process efficiency through re-utilisation of energy and/or material process streams by at least 15%;
- CO₂ emissions reduction by at least 5% and reduction of the environmental impact in terms of the main key performance indicators by at least 15%;
- Effective dissemination of major innovation outcomes to the current and next generation of employees, through the development, by education/training experts, of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programmes.



Topic ID and title	CE-SPIRE-04-2019: Efficient integrated downstream processes				
Budget	EUR 65,8 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	IA Innovation Action				
FTP subsector	Pulp, paper & processing				
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high
	3.4 Biorefinery concepts				medium
					low

Specific Challenge:

Today, process industry operations for downstream processing represent on average 50-60% of the total capital (CAPEX) and operating costs (OPEX) and they account for up to 45% of the process energy in industrial operations. These high costs for downstream processing are often linked to the inefficiencies in the upstream process, due to low conversion and formation of co-products, by-products and/or impurities. Hybrid processing technologies (including chemical and biochemical steps) can provide major advantages in terms of primary process selectivity and sustainability. However, they have not been widely deployed in industry so far. The development of novel technologies for upstream and downstream unit operations, as well as their better integration, could provide significant resource and energy efficiency gains.

Scope:

Proposals submitted under this topic are expected to provide novel solutions for a deeper integration of upstream and downstream processing operations. Proposals should consider:

- Intensified process technologies presenting multistep upstream processes, potentially exploiting hybrid chemo and bio catalytic technologies as well as process analytical techniques (PAT), in order to maximise production efficiency, selectivity and mitigation of downstream processing;
- Complex downstream operations, integrating different separation techniques and purification steps;
- Modularity and flexibility of the solutions, as well as, potential for transition from batch to continuous operations;
- The technologies proposed should enable increased productivity, purity and quality of products, while lowering the process environmental footprint and increasing resource and energy efficiency;
- The potential for integration in the current industrial scenario, and the replicability of the concept in different sectors of the process industry;
- Increased safety of the work environment.

Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:



- 20% decrease in greenhouse gas emission;
- Increased in resource and energy efficiency by at least 20%;
- Novel modular and scalable integrated (upstream-downstream) pilot line technologies with 10% decrease in CAPEX and OPEX;
- Effective dissemination of major innovation outcomes to the current and next generation of employees, through the development of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programmes.



Topic ID and title	CE-SPIRE-05-2019: Adaptation to variable feedstock through retrofitting				
Budget	EUR 65,8 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	IA Innovation Action (50 %)				
FTP subsector	Pulp, paper & processing				
FTP SRA	3.4 Biorefinery concepts			FTP relevance	high
					medium
					low

Specific Challenge:

Process industry plants have to be operated for a long time to make their operations viable. They include equipment such as furnaces, reactors, raw materials handling and storage systems which sometimes have a lifetime beyond 30 years. Keeping these facilities up to date from a technological and from regulatory point of view (for instance related to zero waste regulations and to the circular economy) is a major challenge. Even industrial plants which are less than 10 years old, are often not equipped for new or renewable (e.g. biomass) materials and alternative or renewable energy input streams. More generally, this increased variety of inputs along with the need for energy efficiency improvements poses a real challenge and requires technological breakthroughs in the process industry.

Scope:

Proposals need to cover the following:

- Implement simulation models and decision support tools for the production chain in an energy intensive sector, including the detection of inefficiencies, in order to allow flexibility with respect to feedstock of variable composition, while offering energy efficiency and product quality;
- The development of tools and methodologies to streamline and support retrofitting;
- Find the most efficient operational input conditions to optimise the performances;
- Develop indicators to modify input variables and its potential of replication across the industry;
- Facilitate and adapt the equipment towards a larger number and more diverse feedstock in order to be ready for a transition in which variability in quality, quantity and price of feedstock are key to make the production competitive and sustainable;
- Solutions should demonstrate the feasibility and suitability of the concepts of retrofitting at industrial scale.

Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

- Increasing the resource and energy efficiency of the targeted processes by 20%;
- Decrease GHG emissions through retrofitting by at least 30%;
- Decreased utilisation of fossil resources in the process industry of at least 20%;



- Reduced OPEX by 30% and increased productivity by 20%;
- Effective dissemination of major innovation outcomes to the current next generation of employees of the SPIRE sectors, through the development, by education/training experts, of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programs.



Topic ID and title	<u>DT-SPIRE-06-2019: Digital technologies for improved performance in cognitive production plants</u>				
Budget	EUR 32,9 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	(3.1 Resource efficiency in manufacturing)			FTP relevance	high
					medium
					low

Specific Challenge:

Shortage in raw materials, increased energy prices and environmental constraints require the European process industry to improve its performance and flexibility and there are unexploited opportunities for digitising a large range of enterprises of very different size in the process industry.

Digitisation endows the production system with capabilities for analysis. This should enable the autonomous operation of the system based on embedded cognitive reasoning, while relying on high-level supervisory control. As a consequence, changes in the production process need to be detected and the system needs to be able to respond to these dynamic fluctuations, by adapting the production to stay within the target ranges of production costs and rate, as well as those of and sustainability parameters. A fully up-to-date interactive and self-learning process control integrated with management tools is essential to obtain an optimal efficiency, while maintaining adequate flexibility of the system in regard to changing feedstock, energy sources and product demand.

Scope:

Proposals need to develop new technologies to realise cognitive production plants, with improved efficiency and sustainability, by use of smart and networked sensor technologies, intelligent handling and online evaluation of various forms of data streams as well as new methods for self-organizing processes and process chains. Furthermore, proposals should cover the full digital transformation of a complete plant or site(s) including e.g. data acquisition, communication, automation, analytics, modelling, prediction and standardisation of relevant data interfaces.

The following elements should be considered:

- Improvement of online monitoring and innovative control technologies in terms of process performance and flexibility, maintenance needs and product quality;
- Digital retrofitting of existing assets, integration towards and holistic optimisation of operations, data-analytics, real-time capability, use role-specific representation of information, feedback control & detect deviations and adjust operations immediately decision support (e.g. advanced process control, reactive scheduling);



- Several among the following concepts: apply low-cost sensors for on-line assessment of product quality and integration into process control; robust optimisation methods to distributed targeted process monitoring; simulation methods for the analysis, characterisation and study of systems for enhanced operations and decision-making combination of various forms of data with cognitive insight to optimise and enhance resources;
- Replicability and scalability of the concepts should be considered appropriately.

Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

Improved capabilities for valid, reliable and real-time control logics of the properties, efficiency and quality of process streams and final products for existing and for more flexible process operation concepts:

- Show potential for improved performance in cognitive production plants;
- Increased production performance, energy and resource consumption, or waste or by-products production will be significantly improved by more than 20%. The targets should be quantified in the proposal and validated during the execution of the demonstration;
- Project outcomes should demonstrate a positive environmental impact, by reducing CO₂ emissions compared to the state of the art and in the scale relevant for the different applications;
- Effective dissemination of major innovation outcomes to the current next generation of employees of the SPIRE sectors, through the development, by education/training experts, of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programmes.



Energy Efficient Buildings (EEB)

Topic ID and title	LC-EEB-01-2019: Integration of energy smart materials in non-residential buildings				
Budget	EUR 53.5 million	Opening date	16 October 2018	Deadline 1 Deadline 2	21 February 2019
Type of action	Innovation Action (IA)				
FTP subsector	Woodworking				
FTP SRA	4.1 Building with wood			FTP relevance	high
	4.2 Indoor environment and functional furniture				medium
					low

Specific Challenge:

Europe is leader in the development of components for buildings retrofitting. Its leadership is based on the use of high-efficient insulation materials including concrete, steel, glass, composites, wood and hybrids, which should lead to achieving recyclable, nearly zero-energy building envelopes (roofs, façades) when applied to new buildings. However, these components do still not allow for the integration of smart energy storage and for an equal performance in existing buildings. This has proved to be very challenging, in terms of complexity, weight control and overall retrofitting costs. Therefore, work is required to advance the technology readiness level. Activities should include the demonstration of new hybrid enabled prototypes for selected non-residential buildings.

Scope:

The development of lightweight components based on high-efficiency insulation materials needs adding active energy management capabilities without increasing weight. Proposals should cover all of the following:

- development of lightweight components for the construction of building envelopes with integral means for combined active/passive management of energy transfer, i.e., for active insulation, heat diversion, storage and directional transfer;
- solutions capable for use in both new buildings and for retrofitting existing ones;
- solutions allowing for installation without modifying the structure of the building (or without overloading existing structures) and demonstrating a high replication and industrial potential;
- modelling of the materials and components as well as to the development of novel testing methodologies oriented towards assessing the long-term performance of the elements. This should include the estimation of durability and service life;
- reduced maintenance costs, possibility of use in a wide range of environmental conditions, favour renewable resources, respect of sustainability principles (International Reference Life Cycle Data System - ILCD Handbook), and the possibility of reuse at the end of service life.



This topic is likely to contribute to standardisation and certification activities. Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

When compared to state of the art, the newly developed solutions should bring:

- Improvement by at least 25% of the insulation properties at component level for a given weight, when in isolation (passive) mode;
- 10% improvement in energy-storage capability when in active mode(s);
- Water and air tightness should be at least 10% higher than existing solutions (when it is proposed a controllable solution);
- Cost increase of less than 15%, in order to allow market uptake across Europe and contribute to social affordability.



Topic ID and title	LC-EEB-06-2018-20: ICT enabled, sustainable and affordable residential building construction, design to end of life				
Budget	EUR 35 million	Opening date	31 October 2017	Deadline 1 Deadline 2	22 February 2018
Type of action	Innovation Action (IA)				
FTP subsector	Woodworking				
FTP SRA	4.1 Building with wood			FTP relevance	high
					medium
					low

Specific Challenge:

The poor energy performance features that buildings may exhibit can be due not only to the characteristics of the building materials used, but also to the use of traditional or unsuitable construction processes. Therefore, the building process needs to benefit from an increased level of industrialisation, including for instance lean construction and higher degree of prefabrication. This is especially true in the case of building retrofitting where the traditional construction methods are not able to plan in advance all the problems to be solved in the variety of renovation sites. Using ICT as an enabler in the building process and operation is a way to meet the challenges. ICT solutions need to incorporate the design, manufacturing, construction, material choice (including reusability, environmental performance and cost aspects), operation and end of life phases affecting the overall building lifecycle. The closer integration of ICT based-building construction tools into the manufacturing, construction and operation phases has a strong impact on the overall building lifecycle, and it will also help reducing the performance gap.

Scope:

Existing generic software tools have limited flexibility and lack interoperability concerning models and design cultures. Vertically integrated life cycle design is still missing, mainly due to a fragmented design culture across the various disciplines. ICT tools should be provided for energy and environmental performance related design, analysis and decision-making in early planning phases for new buildings or renovation of buildings. Clear evidence of technical and economic viability should be provided by validating and demonstrating the proposed ICT-driven construction processes in either new or retrofitting projects. For existing buildings, significant effort will be required to first retrieve all relevant information, and to compile and structure it in a meaningful form to be used by new solutions.

Proposals should:

- Develop an advanced digitalised and industrialised construction and building process utilising smart combinations of materials/components;
- Assess the overall life cycle of construction, in order to deliver more efficient buildings in terms of sustainability and construction, maintenance and operation costs;



- Provide for fully integrated systems to be compact, exchangeable, and easy to commission and to operate and demonstrate business solutions for operating such building life-time ICT solutions.

Activities should start at TRL 5 and achieve TRL 7 at the end of the project.

Expected Impact:

Proposals should achieve all of the following:

- Reduction of CO₂ with 15-20% for the total life-cycle compared to current situation shown through Life Cycle Assessment;
- Construction cost reductions of at least 15% compared to current situation;
- Buildings shortened construction time (reduced by at least 10-15% compared to current State of the art);
- Reduction of the gap between predicted and actual energy consumption;
- Improved indoor environment;
- Significantly improved integration of the value chain (design, procurement, manufacturing, construction, operation and maintenance);
- Contribution to new standards and regulations;
- Demonstration of large scale replicability potential.



INDUSTRIAL LEADERSHIP – Space

CALL – SPACE 2018-2020

Topic ID and title	LC-SPACE-02-EO-2018: Copernicus evolution – Mission exploitation concepts				
Budget	EUR 8 million	Opening date	31 October 2017	Deadline 1 Deadline 2	06 March 2018
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high
	2.2 Forest ecology and ecosystem services				medium
	2.3 Enhanced biomass production				low

Specific Challenge:

The user requirements process undertaken by the Commission and the Space Strategy for Europe has identified possible evolutions of the space observations capabilities in the context of Copernicus. These are described below, and specific guidance documents explaining the ongoing process to gather new user requirements will be provided.

The following three priorities have been identified for potential evolution of Copernicus in the future:

- Monitoring of the Polar Regions, notably the Arctic, specifically for sea ice and environmental conditions
- Agriculture monitoring, specifically for supporting the Common Agricultural Policy.
- Forest monitoring, specifically for supporting the REDD+ (Reducing Emissions from Deforestation and forest Degradation) process at international level.

The development, the implementation and eventually the operation of an enhanced European capacity will need the involvement of various players, such as National Space Agencies, European and Member States Institutions, International Organisations, the private sector, operators of in-situ measurement stations, and of leading scientific experts in the identified fields such as data assimilation and modelling for the Arctic, agriculture monitoring and forest monitoring. In particular, it will need to build on past activities of the European Space Agency (ESA) and will need to be coordinated with the ESA's on-going and future programmes.

Scope:

The scope is identified according to the possible evolution scenarios indicated above. Each proposal shall address only one of the following sub-topics.

C – Preparation of a European capacity for improving forest monitoring



To advance in a coordinated preparation of a mature European capacity in this forest monitoring field, there is need to bring together the key European stakeholders and competent entities which are:

- engaged in activities that can answer questions raised in and beyond the support to the REDD process;
- have the ability to network with suitable research actors to fill the knowledge gaps;
- have the required expertise to assess the needs for an end-to-end operational system at least on a scale of REDD region, with due attention to potential international cooperation opportunities for tackling this challenge from local to global levels.

At the same time, there is a need for an accompanying scientific and technical support to address:

- How to improve Copernicus' ability to support forest management and sustainable logging, the evaluation of forest damage and disturbance, the detection of burned areas, the assessment of forest biomass and health in light of different scenarios including the availability of additional complementary data from space;
- Identification of research gaps regarding integration/assimilation/utilization of space based data for forest monitoring, at global, European, national and local levels.

Activities shall coordinate ongoing efforts, include mutual identification of research and infrastructural gaps, identify a clear delineation between a core service and a downstream application and facilitate a cooperation of further research and development to be undertaken to reach sufficiently mature capacities for an operational integration as a subsequent step. This topic contributes to the Horizon 2020 focus area "Building a low-carbon, climate resilient future"

Expected Impact:

Laying the foundation for complementing the existing Copernicus services and the current Copernicus observation capabilities for operational capacities for:

- C: Operational forest monitoring from local to global levels, respectively;

Improved the interaction in the context of the evolution of Copernicus with:

C: UN REDD process and associated policies, of EU Forest Strategy, as well as of the local forest manager needs



H2020 Pillar: Societal Challenge

SOCIETAL CHALLENGE 2: Food Security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy

CALL – Sustainable Food Security

Topic ID and title	CE-SFS-25-2018: Integrated system innovation in valorising urban biowaste				
Budget	EUR 20 million	Opening date	31 October 2017	Deadline 1 Deadline 2	13 February 2018
Type of action	IA Innovation action				
FTP subsector					
FTP SRA	2.5 Cascade use, reuse and recycling systems			FTP relevance	high
	3.1 Sustainable water stewardship				medium
	4.3 New biobased products				low

Specific Challenge:

Most of the biowaste produced in cities (such as garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises), as well as sewage sludge from urban wastewater treatment plants are processed into compost and biogas used for energy recovery or even landfilled without fully exploiting in a smart and innovative cascading fashion its potential as feedstock for valuable and precious compounds. New and emerging processing technologies can enable the recycling and valorisation of urban biowaste into higher-value biobased products (e.g. biobased chemicals and plastics, nutrients, human food or animal feed ingredients and proteins), thereby generating significant economic, social and environmental benefits. The successful implementation of urban biowaste recycling and valorisation technologies will require an integrated system innovation approach in a city context. Besides the technological challenges, there will be a need for public authorities to adopt new policies; changing citizens' behaviour will require social innovation initiatives, and new, profitable business models along the entire urban biowaste value chain will have to be developed.

Scope:

Proposals shall focus on an integrated system innovation approach in urban biowaste recycling and valorisation for the production of high-value biobased products, including proteins for food and feed. Proposals shall ensure the full integration of the upgraded urban biowaste value chain into the existing local waste/wastewater management schemes. Proposals shall guarantee the active participation of local and regional authorities, waste/wastewater management utilities, (biobased) industries, the scientific community, local communities and citizens. Particular attention shall also be given to: Life Cycle Assessment



(LCA) of the entire urban biowaste value chain; improving logistic models taking into account changing the behaviour and participation of citizens and local communities in relation to the collection and use of this particular feedstock; increasing consumer awareness and acceptance of urban biowaste-derived products; adapting/developing business models for successful market uptake; food and feed safety aspects; regulatory aspects; and facilitating the exchange of good practices and experiences between all stakeholders. The proposal should seek the complementarity to the projects funded under H2020 topics CIRC-05-201656, H2020 CIRC-02-2016-A and the topic BBI 2016.

Expected Impact:

In the framework of SDG no 3, 6, 9, 11, 12 and 13, the EU's Bioeconomy Strategy 2012, the EU's Circular Economy Package 2015, and the FOOD 2030 Staff Working Document, proposals shall assess their contribution to:

- Validated technical and economic viability of the proposed approaches at target TRL7;
- New business and organisational models on cities ensuring the full integration of the upgraded urban biowaste value chain into the existing local waste/wastewater management schemes;
- Improved perception of citizens on urban biowaste as a local resource and their enhanced active participation in its separate collection through social innovation initiatives;
- Improved consumer acceptance of urban biowaste-derived products, including food and feed ingredients;
- A more sustainable and resilient protein supply chain;
- Safety assessment of biobased processes and products from urban biowaste;
- Reduced amount of urban biowaste that would otherwise be incinerated or landfilled, and hence reduced environmental impact (including emissions of GHG and of air pollutants and their precursors) of municipal and food waste;
- Detailed assessments of specific technical, regulatory, financial, market and logistical barriers hampering the full exploitation of the urban biowaste value chain;

Evidence-based support for EU policies/targets in the biobased and circular economy, climate mitigation, sustainable growth and re-industrialisation.



Topic ID and title	LC-SFS-19-2018-2019: Climate-smart and resilient farming				
Budget	EUR 7 million	Opening date	31 October 2017	Deadline 1 Deadline 2	13 February 2018 11 September 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high
	2.1 Multi-purpose management of forests				medium
					low

Specific Challenge:

Evidence on climate change is solid and reveals that it will affect the EU with European farming first in line through changes to rainfall regimes, rising temperatures, the variability and seasonality of the climate and the occurrence of more frequent extreme events (heatwaves, droughts, storms and floods). In addition to finding effective solutions for greenhouse gas (GHG) mitigation such as reducing GHG emissions and sequestering carbon below and above ground, farmers will need to adapt to climate change and develop farming systems resilient to fluctuating environmental and socio-economic conditions.

Scope:

Proposals should address only one of the sub-topics (A) or (B).

B. [2019] Efficiency and resilience of mixed farming and agroforestry systems (RIA)

Activities will develop further mixed farming systems and show how the integration of crops, and forestry activities can improve the resilience of agriculture in combination with the related climate change mitigation potential (e.g. carbon sequestration, nutrient recycling). Proposals should enable the participative design of mixed farming and agroforestry systems not only focusing on technical and agronomic aspects but also taking on board socioeconomic aspects of mixed farming modes, the related value chains and necessary infrastructures as well as the environmental and climate mitigation and adaptation potential. Proposals will contribute to increase synergies between crops and livestock by defining optimal combinations of production to increase income stability at farm level and sustainability of the relevant value chains. They shall develop models and tools adapted to real farm management to grasp the inherent complexity of mixed farming and agroforestry systems. Proposed work shall benefit both the conventional and organic sectors. Activities will use transdisciplinary research methods and proposals should fall under the concept of the 'multi-actor approach'.

All sub-topics:

The proposals funded under this topic (sub-topics A and B) will contribute to the development of a conceptual framework on resilience and mitigation at different levels (farm, community, region, national and EU) and its policy implications.



Expected Impact:

Funded activities will improve the climate and socio-economic resilience of the agricultural sector. In the short to medium term work will:

- Deliver effective solutions for ensuring the highest level of implementation on the farm and landscape scale regarding climate-smart and resilient systems and provide decision support systems adapted to mixed farming and agroforestry systems in heterogeneous landscapes;
- Unlock and improve viability and replicability of efficient and resilient farming systems and propose different transition scenarios leading to the development of modern land use systems, value chains and infrastructures;
- Reduce the environmental impact of farming and contribute towards mitigation and adaptation to climate change;
- Provide ecosystem services through integrated and small-scale land management. In the longer term funded activities will help to foster the synergies between agricultural production, climate change mitigation and adaptation. They will allow the farming sector to continue fulfilling its multiple functions under predicted, more challenging abiotic conditions.



Topic ID and title	LC-SFS-20-2019: European Joint Programme on agricultural soil management				
Budget	EUR 40 million	Opening date	16 October 2018	Deadline 1 Deadline 2	23 January 2019
Type of action	COFUND-EJP COFUND (European Joint Programme)				
FTP subsector	Forestry				
FTP SRA	2.1 Multi-purpose management of forests	FTP relevance	high		
	2.2 Forest ecology and ecosystem services		medium	?	
	1.1 The performance of the sector in a perspective of global change		low		

Specific Challenge:

Good agriculture soil management contributes to food security, climate change mitigation/adaptation and ecosystem services. Preserving and increasing fertility of soils, not least through their organic content and water retaining capacity, increases agricultural production. Soils and their carbon content are also important for climate change mitigation. A number of good soil management practices have been developed to deal with some of the challenges; however serious knowledge gaps exist, e.g. on the characteristics of soils in various regions of Europe, the factors influencing their fertility or their capacity to store carbon, depending on different climate and environment conditions. The European Union is committed to addressing climate change with ambitious targets. An integrated framework for soil research in Europe is required to overcome current fragmentation and unleash the potential of agricultural soils to contribute to climate change mitigation/adaptation, while preserving or increasing agricultural functions.

Scope:

The European Joint Programme will boost soil research with main emphasis on agricultural soil contribution to climate change mitigation and adaptation. The aim is to construct a sustainable framework for an integrated community of research groups working on related aspects of agricultural soil management. The activities should look at how management of agricultural soils can reduce degradation of land and soils (in particular soil erosion and loss of organic matter), preserve and increase fertility of soils and how the processes related to organic content and water retaining capacity can support mitigation and adaptation to climate change. The EJP will evaluate and foster implementation of novel technologies for soil management and carbon sequestration. The aim of the EJP is also to look for synergies between different approaches used in Europe for farm level accounting of emissions and removals from agricultural activities and particularly of carbon storage. In doing so, activities will contribute to improving inventories, measurements, reporting and accounting activities at different scales. Sustainable agricultural productivity and environmental aspects will also be targeted in connection with climate change mitigation and adaptation, so that optimisation of land management is ensured.



The European Joint Programme will include joint programming and execution of research and other joint integrative activities such as education and training (e.g. short-term missions, workshops), knowledge management, access to experimental facilities and databases, including also harmonisation, standardisation.

State-of-art technologies for mapping and soil sampling (physical, chemical and biological parameters) should be explored for wider and simple use from national level to farm level. In return, by e.g. developing new ICT tools, this could help farmers to protect and manage soils in line with current scientific understanding of processes. The EJP should also facilitate sampling and further development of LUCAS – European Soil Database as well support EU contribution to global soil mapping activities. Participating legal entities must have research funding and/or management responsibilities in the field of agriculture soil management.

The proposal should include a five-year roadmap describing the key priorities and governance processes as well as the first annual work plan. The acquired knowledge should support policy making in the domain of agricultural soil management and related policies, such as agriculture, climate and environment, and when feasible and appropriate transfer of science to practice for better agricultural soil management by farmers should be envisaged.

Expected Impact:

The project will lead to significant long term alignment of research strategies and activities at national and EU level by:

- fostering understanding of soil management and its influence on climate mitigation and adaptation, sustainable agricultural production and environment;
- understanding how soil carbon sequestration can contribute to climate change mitigation at regional level including accounting for carbon;
- strengthening scientific cooperation at European level including training of young scientists;
- development of agreed knowledge base and database for European contribution towards international reporting;
- contributing to the European Soil Data Centre with harmonised European soil information for international reporting.



Topic ID and title	SFS-05-2018-2019-2020: New and emerging risks to plant health				
Budget	EUR 7 million EUR 7 million	Opening date	31 October 2017 16 October 2018	Deadline 1 Deadline 2	13 February 2018 23 January 2019 11 September 2018 04 September 2019
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	2.1 Multi-purpose management of forests			FTP relevance	high
	2.2 Forest ecology and ecosystem services				medium
	1.1 The performance of the sector in a perspective of global change				low

Specific Challenge:

Trade and the movement of goods and people have facilitated the introduction, spread and establishment of plant pests and diseases. While new pests and diseases are likely to arise, existing ones might become more severe as a result of intensification, climatic variations and changes in agricultural and forest management practices. They can have a significant impact on agricultural and forest productivity. Appropriate and rapid responses from decision-makers need to be informed by scientific knowledge which addresses pest and disease management in a comprehensive manner.

Scope:

Proposals will target one or more new or emerging plant pests and/or diseases (regulated or non-regulated, introduced or native) that are causing, or likely to cause, significant (socio-)economic and/or environmental losses to EU agriculture/forestry. The choice of target pest and/or disease will consider the potential threat in terms of development and spread, its potential exacerbation under climate change as well as the potential impact on agricultural production, forestry, trade and the wider environment. Proposals will increase knowledge of the biology, development and spread of pests/diseases. They will improve methods and strategies for early detection, prevention and control as well as enlarge the range of tools for integrated and sustainable pest/disease management. International cooperation with countries affected or threatened by the same pest(s)/disease(s) is encouraged. Proposals should fall under the concept of the 'multi-actor approach'²⁴ including a range of actors to ensure that knowledge and needs from various sectors such as research, plant health services and the farming/forestry sector are brought together.

Expected Impact:

Activities will contribute to finding adequate responses to new and/or emerging plant pests/diseases. More specifically knowledge and solutions generated by these actions will contribute to:

- the understanding of drivers of plant pest/disease emergence including the influence of climate change;



- the development of efficient tools for the prevention, detection and control of pests/diseases;
- the development of environmentally sound solutions for pest/disease management in farming and forestry in line with the principles of Integrated Pest Management;
- the reduction of economic, social and/or environmental losses by the farming/forestry sector;
- support for relevant EU plant health policies.



Topic ID and title	SFS-28-2018-2019-2020: Genetic resources and pre-breeding communities				
Budget	EUR 3 million EUR 14 million	Opening date	31 October 2017 16 October 2018	Deadline 1 Deadline 1 Deadline 2	13 February 2018 23 January 2019 04 September 2019
Type of action	A: CSA Coordination and support action B: RIA Research and Innovation action				
FTP subsector					
FTP SRA	2.1 Multi-purpose management of forests	FTP relevance	high		
	2.2 Forest ecology and ecosystem services		medium	?	
			low		

Specific Challenge:

Genetic resources (GenRes) play a crucial role in agricultural activities and sustainable forest management in Europe. They hold the key to the adaptation of plants and animals to a changing and more variable climate, yet their diversity remains largely underused in current breeding, farming and forest management. Conservation efforts (in-situ, ex-situ) aim to capture, preserve and make available a substantial share of these global assets. However, access to resources is often limited by the quality of the material and the information provided by the various conservation sites. With increasing concerns over biodiversity loss and genetic erosion, there is a need to step up collaborative efforts to expand and improve the preservation as well as the use of plant and animal GenRes in farming and forestry.

Scope:

A range of activities implemented by a wide range of stakeholders will seek to enhance management and use of GenRes and implement global commitments in this area. While the focus of activities is on Europe, international resources and activities shall be taken into account. Proposals should address only one of the following sub-topics:

A. [2018]: Joining forces for GenRes and biodiversity management (CSA)

Activities will provide a framework in which the existing mosaic of European, national/regional structures can join forces to develop and implement ambitious approaches and strategies for the management of crop, forest and animal GenRes. In addition to advancing individual roadmaps, inventories and information tools for crop, forest and animal GenRes, cooperation between the different communities shall foster GenRes conservation within a wider (agro) biodiversity context. Particular care shall be taken to building and widening capacities across Europe and neighbouring countries (including Mediterranean countries), exchanging best practices, harmonising standards as well as sharing resources and data.

B. [2019]: Adding value to plant GenRes (RIA)

Activities will address processes, tools and know-how associated with a dynamic management and documentation of GenRes collections (both ex-situ and in-situ, as



appropriate). They will add value to the preserved germplasm to promote its use, e.g. in breeding, farming, forestry and by consumers. Work will enable the development and testing of a range of solutions to enhance quality and efficiency of operations and services across collections. Major efforts should go into capturing and characterising the genetic diversity in germplasm and revealing novel information to users. This will include acquiring comprehensive and more precise genotypic and phenotypic information on GenRes material, understanding the connections between the two, how they vary in different environmental contexts and having in place appropriate (bioinformatic) tools for data processing, exchange and visualisation. Due account shall be given to disclosing the potential of less adapted material from genebanks/in-situ conservation sites in relation to valuable traits associated with resilience, adaptability and quality of crops. Proposals should foresee a task for joint activities with other projects financed under this topic.

Expected Impact:

Activities will enhance the status of genetic resources and increase effectiveness of conservation efforts, in particular in Europe. In the short to medium term work will:

- result in the development and/or implementation of integrated strategies for conservation and use of crop, forest and animal GenRes as well as for wider biodiversity (sub-topic A);
- enhance user oriented services provided by networks involved in plant (agriculture and forestry), and animal GenRes management (sub-topic A);
- help establishing high quality, harmonised standards for the management and description of GenRes across Europe (and beyond) (sub-topics A and B);
- increase the quantity and quality of data in established information systems for crop, forest and animal GenRes (sub-topics A and B);
- promote innovative ways of sharing resources and services between genebanks/in-situ conservation sites in Europe and beyond (sub-topics A and B);
- develop methods and tools for greater insight into the characteristics and the value of collections (sub-topic B);
- create novel services for users within and outside the conservation communities (subtopic B).

In the long term activities will allow tapping into the vast potential of GenRes more effectively in order to meet current and future needs of food security, the delivery of non-food products from primary production and support the different functions of forestry.



CALL – Rural Renaissance

Topic ID and title	CE-RUR-08-2018-2019-2020: Closing nutrient cycles				
Budget	EUR 8 million	Opening date	16 October 2018	Deadline 1 Deadline 2	23 January 2019
Type of action	IA Innovation action				
FTP subsector	Forestry				
FTP SRA				FTP relevance	high
					medium
					low

Specific Challenge:

The EU depends strongly on external sources for the supply of key fertilisers used in agriculture. Resource depletion and an increasing global demand for mineral fertilisers may, in the long term, lead to price tensions with an impact on food security. Mineral-based fertilisation also poses significant environmental problems, linked e.g. to the amounts of fossil energy needed to produce and transport these fertilisers. At the same time, large amounts of minerals are being dispersed in the environment through a large variety of organic waste streams, resulting in soil, water and air pollution. Agro-food specialisation has led to regional imbalances: whilst in some regions a nutrient overabundance is causing severe environmental impacts (e.g. nitrate pollution), other are experiencing nutrient deficits. These contrasting effects may also be observed between locations within the same region. Several technologies are being developed to recover and re-use nutrients from organic by-products, but many are insufficiently mature and the characteristics of end-products do not always match end-user preferences. It is expected that the EU ‘circular economy package’ will boost the emergence and commercialisation of such new fertilisers, hence it is important to understand their agronomic and environmental performance in order to establish adequate policies, guidelines and application rules.

Scope:

Proposals shall address inter-regional and intra-regional imbalances through effective nutrient recovery from by-products of the agro-food or the forestry sectors, and conversion into novel fertilisers. Proposals should include a task to cluster with other projects financed under this topic, under topic SFS-39-2019 and – if possible – with other relevant projects in the field funded by Horizon 2020 (including under the BBI JU). Proposals should address only one of the sub-topics A-C:

C. [2020] Bio-based fertilisers from other by-products of the agro-food, fisheries, aquaculture or forestry sectors (IA)

Description not yet available



Expected Impact:

Proposals are expected to provide the technologies needed to develop a new generation of commercial, sustainable and safe fertilisers based on organic by-products, and the scientific knowledge needed to frame their use. This will help to:

- set up a coherent policy framework for the sustainable production and use of organic-based fertilisers (sub-topic A);
- replace conventional, non-renewable mineral fertilisers, hence reducing external dependence and risks related to depletion (sub-topics A, B and C);
- balance nutrient concentrations between or within regions, thus increasing resource efficiency (sub-topics A, B and C);
- reduce the environmental impacts linked to the dispersion of nutrients present in waste flows, or to the production of fossil-based fertilisers (sub-topics A, B and C);
- develop new business models creating value from agro-food, fisheries, aquaculture or forestry by-products (sub-topics B and C).

In the long term, this shall contribute to a thriving, sustainable and circular bio-economy, the development of new business models that are synergic with other economic sectors, and therefore to the creation of wealth and quality jobs in rural areas.



Topic ID and title	CE-RUR-10-2019: Circular bio-based business models for rural communities				
Budget	EUR 10 million	Opening date	16 October 2018	Deadline 1 Deadline 2	23 January 2019
Type of action	IA Innovation action				
FTP subsector	Forestry				
FTP SRA	2.1 Multi-purpose management of forests			FTP relevance	high
	3.5 New business models and service concepts				medium
					low

Specific Challenge:

To boost the development of a bio-based economy in Europe, there is a need for business models that can be replicated easily in a variety of locations and contexts, with relatively low levels of investment, risk and technical sophistication. A wider range of rural entrepreneurs need to get involved in the emerging bio-based business sector, including farmers, forest owners, their associations, and small rural business. This will help to diversify and revitalise the economy and create quality jobs in rural areas. Local and regional authorities need to do more to support the bio-economy in their respective territories. They should therefore have a range of options to choose from and be able to select the approach that best suits local needs and assets. As a key part of a circular economy, the bioeconomy needs to close loops to make the most efficient possible use of biomass under market and logistical constraints, and to ensure the sustainability of business models.

Scope:

Based on an established agro-food system, proposals shall consider a variety of additional bio-based processes and end products that could be integrated into the system, and that are viable on a small scale (farm to rural community level). The TRL of the technologies considered can vary at the start. The project shall test and demonstrate the combination of these in a circular configuration. The integrated system shall achieve a TRL 6-7. Proposals can target any combination of non-food bio-based outputs, but projects focussing mainly on bio fuels or bio-energy are not eligible. The choice of feedstock sources shall avoid negative effects on food security. Proposals shall focus on a single agro-food system that should be common in Europe and offer high replication potential, and can be combined with sustainable management of natural areas and/or use of marginal lands. A complete assessment (economic, environmental and social) of the integrated system shall be carried out. The project shall include a business plan, and a set of policy options and recommendations.

Expected Impact:

Proposed activities will expand the range of business models available to entrepreneurs and local authorities by developing circular and sustainable business models with large potential



for replication in areas with unexploited resources, at a relatively low cost, risk and with low levels of technical complexity. This will help to:

- expand and diversify the sector by mobilising a wider range of players in the bio-based economy, including small businesses, farmers, forest owners and their associations;
- develop regional and local bio-based models adapted to the wide variety of contexts found in the EU, including rural and remote areas and outermost regions;
- ensure adequate recovery of nutrients and organic matter, and their reuse in agriculture.

In the longer term results consolidate a diversified, circular and climate-friendly bio-based sector that harnesses regional assets, provides quality jobs and opportunities in rural areas and revitalises rural economies.



Topic ID and title	LC-RUR-11-2019-2020: Sustainable wood value chains				
Budget	EUR 20 million	Opening date	16 October 2018	Deadline 1 Deadline 2	23 January 2019
Type of action	IA Innovation action				
FTP subsector	Woodworking				
FTP SRA	4.1 Building with wood			FTP relevance	high
	4.3 New biobased products				medium
					low

Specific Challenge:

Forests play a vital role in Europe's economy, society and environment. Scenarios likely to keep the global warming below 2C (Paris Agreement goal) would entail a substantial reduction of anthropogenic GHG emissions, through far-reaching changes to energy systems, land use and associated value chains. The second consumer-driven factor of GHG emissions is the construction sector (ca. 15%), implying a significant role for forest-based products. The forest-based sector can contribute to climate change mitigation through increasing sinks in and reducing emissions from living biomass, soils and wood products, and the substitution of fossil fuels through the material and energy use of wood-based materials. The combined sink and substitution effects of wood value chains can provide a key mitigation option, provided that changes in fossil and biogenic carbon are taken into account in a comprehensive and balanced manner. Several research projects and COST Actions launched in FP7 looked into the development of innovative, resource efficient wood-based products. While ensuring the sustainability of forest production systems under changing climate conditions remains a long-term objective for the sector, a key challenge now is to further develop and deploy the technological advancements of micro/macrocimate-friendly wood-based value chains on the ground.

Scope: A. [2019] Building with wood:

Proposals shall develop and test new technologies and environmental friendly solutions for the use of wood-based materials in the (re)construction and/or retrofitting of buildings. Proposals should also explore options for building with wood in combination with composite/hybrid materials, linkages with other nature-based solutions, make use of ICT, and consider LCA and carbon accounting, 'environmental documentation' (i.e. standards and construction codes), performance standards, public policies and regulations, consumer perception and engagement/co-creation. Activities could include limited research and shall produce plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose, they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication. Proposals shall ensure that relevant actors (researchers, citizens, policy makers from urban/rural areas, businesses, architects, site managers, etc.) work together during the whole research and

innovation process in order to better align the process and its outcomes with the societal values, needs and expectations.

B. [2020] Resilient forest systems

Both sub-topics (A and B) are suitable for INCO and SMEs participation, and are expected to integrate technology with SSH and RRI aspects. The Commission considers that proposals requesting a contribution from the EU of the order of EUR 10 million for sub-topic A and 5 million for sub-topic B would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

In the framework of SDG 9, 11, 13 and 15, the EU's Bioeconomy Strategy 2012, the EU's Forest Strategy 2013, the Circular Economy Package 2015 and Paris Agreement 2015, proposals are expected to assess how they will contribute to:

- Increased resource and/or energy efficiency and added value and minimising pollution and the environmental footprint (emissions of GHG and air pollutants included) in the construction sector in the cities, by specific amounts/proportions to be specified in the proposals, by 2030 [sub-topic A];
- Enhanced connectivity of rural-urban areas and their overall contribution to a resilient, circular and competitive, forest-based bioeconomy, by 2025 [sub-topic A];
- Increased long-term resilience of forest production systems and associated value chains to enhanced climate/environmental change and societal demand [sub-topic B];
- Enhanced contribution of forest-based sector to long-term climate change mitigation and rural development objectives [sub-topics A & B];
- Also in the long-term, prompt a sizeable positive change to European landscapes and economies, by keeping the countryside green and serving to make the cities greener, and increasing the share of both decent and green jobs [sub-topics A & B].
- Advance available solutions from TRL 4-5 to TRL 6-7 for sub-topic A and from TRL 3-4 to TRL 5 sub-topic B



Topic ID and title	<u>RUR-01-2018-2019: Building modern rural policies on long-term visions and societal engagement</u>				
Budget	EUR 5 million EUR 12 million EUR 6 million	Opening date	31 October 2017 31 October 2017 16 October 2018	Deadline 1 Deadline 1 Deadline 2 Deadline 1 Deadline 2	13 February 2018 13 February 2018 11 September 2018 23 January 2019 04 September 2019
Type of action	A: CSA Coordination and support action B+C: RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance	FTP relevance		high	
	2.1 Multi-purpose management of forests			medium	
				low	

Specific Challenge:

The design of modern rural policies requires capturing and anticipating the long-term trends affecting European rural areas. The EU has already invested in rural research on a variety of issues, although the impact on policies has been insufficient due to the diversity of rural areas, the complexity of the problems at stake and the multiplicity of policy makers involved. The interfaces between science, society and policy makers need to be improved to enhance the use of new and existing knowledge, provide policy makers with the evidence they need and empower rural citizens to take part in policy-making, including designing future research priorities. In addition, there are still knowledge gaps regarding big challenges facing rural areas and how they will impact people and territories. One of the most important is demographic change. Current trends combine rural exodus, selective outmigration of women and young people and the arrival of newcomers, including migrants, highly-skilled former urban dwellers and retired people. The challenge is particularly acute in the farming sector. With 6% of farmers under the age of 35, as opposed to 55% who are above 55, the ageing of farmers is one of the biggest threats to food security, farming systems diversity, biomass provision and rural vitality in the coming decades. The situation is similar for small forest owners. A new generation needs to be empowered to take over.

Beyond young farmers, who are supported by the common agricultural policy (CAP), a broader group of people referred to as "new entrants into farming" could contribute to generation renewal while bringing new approaches to farming and rural areas. This could happen provided they can overcome the many obstacles they face, such as access to land. Finally, long-term trends and changes are likely to increase disparities between rural areas faced with various constraints. Mountainous areas, which represent 15% of EU utilised agricultural area and are particularly supported under the CAP, are likely to be more strongly impacted by climate change, as well as by increased economic competition, due to geophysical conditions which limit productivity, production choices and adaptability. A deeper understanding of how rural communities, territories and businesses will evolve is needed to design new policies that would protect rural areas from the existing threat of decline and help them seize opportunities.

Scope:

Proposed actions shall address one of the following sub-topics:

A. [2018] Rural society-science-policy hub (CSA)

Actions shall setup a knowledge and policy hub that engages policy makers, scientists, stakeholders and rural dwellers locally with the objectives to: take stock of past and on-going rural research; translate outcomes into attractive and easily understandable tools for policymakers and citizens; conduct public engagement activities contributing to future rural policy and research policy design; and explore avenues for longer-term science-society-policy interfaces. Activities shall at least build upon relevant past and on-going research projects funded under EU framework programmes in the last fifteen years, including those under this topic, and consider integrating toolboxes and datasets used within these projects. Communication products and tools shall bring real adding-value content to the different target groups in various countries and languages. The use of multimedia is encouraged. Public engagement activities shall involve rural dwellers, policy-makers and other business, social innovation or community actors at various geographic levels in a representative and balanced set of geographical and socio-economic situations across the EU, including coastal areas. Building on knowledge made accessible and on outcomes of foresight activities under this topic, public engagement activities shall result in concrete proposals to renew policy instruments that impact rural areas at various levels, as well as an agenda for future research activities matching rural citizens' needs. Close cooperation and networking activities will be needed, throughout the project, with relevant networks and platforms and with all the relevant on-going projects. The duration of the project shall take into consideration the need to implement participatory approaches.

B. [2018] Renewing rural generations, jobs and farms (RIA)

Actions shall carry out foresight analyses of the evolution of European rural populations and jobs, in time and space, in the coming decades, describing the drivers and root causes explaining the expected changes. They shall cover all economic sectors with particular attention to farming (including farm structures and forest and farm land ownership) and all socio-economic and age categories, with special attention to women, young people and migrants (from inside and outside the EU). Beyond basic demographic indicators, activities shall extend to skills profiles and other relevant social capital dimensions. A significant part of activities shall be dedicated to rural newcomers and new entrants into farming, improving the understanding of their human, social and professional characteristics and of their role in generation renewal, in innovation and in rural development in general. The issue of access to land, including the impact of such aspects as legal and policy arrangements and land market trends, shall be analysed. An EU-wide quantitative analysis shall be combined with more focused qualitative analyses. The qualitative analyses shall include significant public engagement activities and cover a representative and balanced set of geographical and



socioeconomic situations across the EU to yield generalizable policy conclusions. Actions shall undertake an ambitious policy design exercise aimed at assessing the performance of current policies and public or private strategies which impact rural and farming attractiveness to different types of people, and at proposing a set of renewed policy options, backed by a prior assessment of their possible impacts, and accompanied by practical tools allowing i) policy makers at EU and other governance levels to easily exploit project outcomes for forward-looking policy design (e.g. typologies, maps, policy analysis, benchmarking); and ii) new rural generations to find inspiration in winning strategies developed by their peers.

C. [2019] Building resilient mountain value chains delivering private and public goods (RIA)

Actions shall carry out foresight analyses of the development of primary production and related value chains and ecosystems in mountainous areas, in the coming decades, looking in particular at the positive and negative effects of climate change, of changes in policies influencing these areas and of broader socio-economic drivers. The analysis shall benchmark production and land-use systems with regards to their capacity to sustainably improve performance and resilience under changing climate and broader conditions while securing public goods provision for uplands and lowlands, taking into account interactions across scales (field, territories and ecosystems) and sectors. Particular attention shall be paid to new or emerging products or practices which could develop sustainably under more favourable climatic conditions. Activities shall cover a variety of situations representing the diversity of environmental and socio-economic conditions in European mountains as well as the diversity of mountain crop, livestock and forest-based products and value chains. Public engagement of stakeholders in the activities will be key to securing relevant results. Activities shall assess whether current policy approaches are fit for the future and shall deliver a set of renewed policy options, backed by a prior assessment of their possible impacts and accompanied by practical tools and recommendations to i) modernise relevant policy instruments available at EU and other governance levels (with a particular focus on CAP, quality policy, regional policy, climate and environment policies and innovation policy tools), ii) adapt value chain development strategies, and iii) secure long-term public good provision.

Expected Impact:

This topic aims to foster the design of future-proof rural policies. In the short to medium term, proposals are expected to:

- translate visions of future trends and dynamics and understanding of the associated drivers into strategic options for policy design, delivery and monitoring and maximise their uptake by the relevant policy levels (sub-topics A,B,C);
- ensure a wide outreach and engagement in most EU Member States through a balanced and representative coverage of activities (sub-topics A,B,C);



- improve the uptake of available knowledge by policy makers and open avenues for long lasting mechanisms improving interfaces between society, science and policy makers (sub-topic A);
- help diversifying rural economic activities, improve the skills base and social capital by identifying and promoting policy options which enhance the attractiveness and sustainable development of rural areas and favour generation renewal (sub-topics B, C);
- increase the number and success rate of new entrants into farming; ease their access to farmland and forested land by promoting the most efficient instruments and strategies implemented in the Member States when it comes to accessing land (sub-topic B);
- maintain and enhance sustainable primary production, income generated by value chains and ecosystem service delivery in mountain areas through adequate policies and integrated strategies (sub-topic C).

In the long term proposed actions shall contribute to improving quality of life, socioeconomic prospects, resilience to climate change, job diversity and the attractiveness of rural areas.



Topic ID and title	RUR-02-2018: Socio-economic impacts of digitisation of agriculture and rural areas				
Budget	EUR 5 million	Opening date	31 October 2017	Deadline 1 Deadline 2	13 February 2018 11 September 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance	FTP relevance	high	?	
	2.1 Multi-purpose management of forests		medium		
			low		

Specific Challenge:

The deployment of information and communication technologies induces changes that impact individuals, societies and the environment in profound and pervasive ways. Agriculture and rural areas will be changing significantly with the multiplication of devices, their increased "intelligence", autonomous behaviour and connectivity. Aside from the benefits of digital innovations, there are also challenges, and sometimes threats, that need to be addressed to ensure that technological innovations go hand in hand with societal needs and expectations. To cope with the digital revolution research needs to clarify its dynamics and its net impact on socio-economic challenges that agriculture and rural areas are confronted now and in the future.

Scope:

Proposals shall analyse the social and economic impacts of digitisation on agriculture and rural areas, looking into costs, benefits and possible trade-offs. Analyses shall distinguish the diversity of agricultural sub-sectors or farming systems and other activities in rural areas, including forest operations. They must cover a representative set of different rural contexts that exist across the EU, analysing the impact of the various policy settings. They shall fill knowledge gaps on the impacts of digitisation on agriculture and rural areas regarding at least: employment and quality of life, functioning of markets and value chains, competitiveness and scalable opportunities for agricultural and rural businesses and (re)deployment of public services. Beyond the impacts of past and ongoing developments, the action shall explore future scenarios for digitisation in the coming decades, characterising drivers and barriers which are likely to accelerate or hamper their respective development, as well as their respective impacts. Proposals shall include activities to work in cluster with projects selected under RUR-01- 2018. They shall fall under the concept of multi-actor approach, engaging representatives of farmers, rural businesses or citizens groups and digital technology providers. Early engagement of public authorities shall help guarantee the relevance of the analysis and the uptake of project outcomes.

Expected Impact:



Anticipating and adjusting policy and strategies to take advantage of digitisation opportunities and mitigate associated risks. For agriculture and rural areas, the project will in the short term:

- fill the socio-economic knowledge gaps on digitisation of agriculture and rural areas, including impacts on existing and future challenges;
- develop the most plausible future scenarios for the development of digitisation;
- raise awareness among key stakeholders about digital game changers, allowing for the development of appropriate coping strategies, in particular at policy level; and
- improve the uptake of societal concerns in ICT-related policy and innovation, by liaising with on-going projects on the digitisation of agriculture and rural areas.

In the longer term, the project will contribute to EU agricultural and rural economies and communities becoming more inclusive and competitive, due to adapted strategies.



Topic ID and title	RUR-09-2018: Realising the potential of regional and local bio-based economies				
Budget	EUR 3 million	Opening date	31 October 2017	Deadline 1 Deadline 2	13 February 2018
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance			FTP relevance	high
	3.5 New business models and service concepts				medium
					low

Specific Challenge:

Bioeconomy is a major opportunity for regional and local communities. Despite broad political agreement, the potential of many European regions to develop a thriving circular bio-based economy using their own resources remains largely untapped. Many factors contribute to this situation, including lack of awareness and practical knowledge among regional/local authorities and stakeholders, low degree of cooperation and networking at all levels, insufficient involvement of local/regional stakeholders in drawing up bioeconomy strategies, or inadequate technology transfer and exploitation of innovation. New, sustainable technology options or business models suitable for local deployment are needed, as current integrated biorefinery models are predominantly based on complex technologies and are difficult to finance, so remain inaccessible to many players.

Scope:

Proposals shall foster cooperation and networking between relevant actors at all levels, so that regional bio-based economies can take off, promote open innovation approaches, and ensure adequate knowledge exchange within and among regions. Emphasis shall be put on increasing the capacities of regional/local authorities and stakeholders, especially in regions with high potential (e.g. underused biomass streams, human capacities), but that have a low number of established biorefineries. Proposals shall ensure proper support and guidance in developing regional strategies and roadmaps through participative approaches, adapted to the local conditions and biomass sources. These shall also include avenues to address the education and information gap on key issues related to sustainability, to increase R&I capacities and to improve the generation of innovation, making best use of the various funding streams available and establishing synergies with relevant policies and programmes, notably those related to rural and regional development, and related Smart Specialisation Strategy implementing bodies.

Proposals shall address the different bio-based business models available for stakeholders and policy-makers, with a specific attention paid to models that could be deployed at a smaller scale in rural areas. Their economic (growth and jobs), social and environmental potential, as well as their advantages and disadvantages compared to larger and more complex models, shall be established.



Expected Impact:

In the framework of the EU Bioeconomy Strategy, the impact of the proposals will be assessed on the basis of:

- Increased capacity of regional/local policy makers and stakeholders to structure their bioeconomy and to support the emergence of a thriving bio-based sector. Adequate knowledge and best practice exchange and networking within and among regions, across the EU;
- Improved capacity of policy makers and stakeholders to make informed decisions, based on a thorough knowledge of the different business models, their respective advantages and disadvantages, and the best approaches to promote them;
- Ambitious regional strategies and roadmaps leading to regional bio-based sectors that are sustainable, inclusive and adapted to local assets and conditions;
- Enhanced research and innovation capacities, and appropriate transfer of research results to regional/local stakeholders.



Topic ID and title	RUR-15-2018-2019-2020: Thematic networks compiling knowledge ready for practice				
Budget	EUR 12,4 million EUR 10 million	Opening date	31 October 2017 16 October 2018	Deadline 1	13 February 2018 23 January 2019
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance			FTP relevance	high
					medium
					low

Specific Challenge:

Despite the continued funding of scientific projects, innovative ideas and methods from practice are not captured and spread, while also research findings are often not integrated into agricultural and forestry practice. It is essential to close the research and innovation divide and to act at EU level. National and sectoral agricultural knowledge and innovation systems (AKISs) are insufficiently connected to fully meet this challenge. More intense cooperation is needed between researchers, advisors and farmers/foresters to stimulate the exchange of knowledge in view of fostering economically viable and sustainable agriculture and forestry.

Scope:

The activities of thematic networks focus on summarising, sharing and presenting, - in a language that is easy to understand and is targeted to farmers and foresters - existing best practices and research findings that are near close to being put into practice, but not sufficiently known or used by practitioners. The specific themes of the networks can be chosen in a 'bottom-up' way and must focus on the most urgent needs of farmers and foresters. If appropriate, they can cover important or promising cross-sectoral issues. They should pay attention to the cost/benefit aspects of the new practices. A comprehensive description of the state of the art on the chosen theme should explain the added value of the proposal, the relevance of the theme and how it avoids duplication with ongoing or completed projects and networks. If duly substantiated, proposals may focus on the widening of an existing thematic network. 'Widening' could apply to content and/or geographic coverage (e.g. through twinning or cross-border exchange visits).

In order to better reach and capture knowledge from the targeted farmers/foresters, the networks may organise 'cross-fertilisation' through subnetworks covering, for example, a region, a language or a production system. The result of the project should be an extensive range of appealing end-user material. This information should be easily to access and understand, and feed into the existing dissemination channels most consulted by end-users in countries. It should also be provided to the European Innovation Partnership (EIP) 'Agricultural Productivity and Sustainability'. Proposals should fall under the concept of the 'multi-actor approach', with a consortium based on a balanced mix of actors with



complementary knowledge involving farmers/foresters, farmers' groups and advisors. Wherever possible and relevant to the chosen theme, synergies and complementarity with EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI are encouraged, and, if useful, with other European Structural and Investment Fund projects. In the exceptional event that minor testing of specific solutions would be needed, a maximum of 20% of the project budget may be used for this purpose.

Expected Impact:

Activities must contribute to the collection and distribution of easily accessible practice-oriented knowledge on the thematic area chosen, including delivering as many as possible "practice abstracts" in the common EIP-AGRI format and as much audiovisual material as possible. The aim is to:

- conserve the practical knowledge for the long term - beyond the project period – using the main trusted dissemination channels which farmers/foresters consult most often, and also serve education and training purposes;
- increase the flow of practical information between farmers/foresters in Europe in a geographically balanced way, creating spill-overs and taking account of the differences between territories;
- achieve greater user acceptance of collected solutions and a more intensive dissemination of existing knowledge.



Topic ID and title	RUR-16-2019: Fuelling the potential of advisors for innovation				
Budget	EUR 5 million	Opening date	16 October 2018	Deadline 1 Deadline 2	23 January 2019
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance			FTP relevance	high
					medium
					low

Specific Challenge:

Despite the continued generation of scientific knowledge, its impact and application in practical farming and forestry is disappointing and its innovative impact poor. Although there are some good examples, the EIP-AGRI evaluation study recommends that more advisors need to be involved in interactive innovation projects to fuel cross-fertilisation and implementation of results. Advisors indeed have clear impact on farmers' and foresters' decisions and should play a key role in linking science and practice. Whereas the term 'advice' until recently merely referred to a given recommendation in the context of linear knowledge 'transfer', advisors should now also develop the skills to be able to take on a more interactive role in projects. These new forms of interaction and 'knowledge exchange' among advisors, farmers, private forest owners, scientists and other actors are unfamiliar to most. There is a need to network advisors to promote this approach and to boost advisors' innovation potential in order to ultimately improve knowledge flows in national and regional agricultural knowledge and innovation systems (AKISs).

Scope:

Activities shall aim at networking advisors to for learning and exchanging interactive innovation techniques that support the transition to a more productive, sustainable and climate-smart agriculture and a higher level of development in rural areas. Projects shall identify and showcase best practices from a broad series of practical cases of advisory services across the EU, with a view to support advisors on how to capture grass-roots innovative ideas from farmers and foresters and further develop them into innovation projects. The activities shall create peer-to-peer learning for active and future advisors as well as training opportunities, e.g. through exchanges and cross-visits abroad. They shall teach advisors the skills for managing and participating in interactive innovation projects and how to intermediate in farmer-to-farmer learning processes. Projects shall identify best practices from a broad series of practical cases of advisory services across the EU. Proposals must expand and update the inventory of advisors in the EU by the PRO-AKIS project, with a particular focus on including all private and public advisors and ensuring an EU wide coverage. Based on this, projects shall collect best practices for well-organised, well connected and effective advisory services supporting innovation and facilitating complementary partners to work together in innovative projects. Proposers are encouraged



to establish links between their activities and existing activities, services and networks, such as those related to the farm demonstration networks, research organisations etc. and seek synergies with national or regional EIP networks and EIP Operational Groups. Projects should provide input to and coordinate their strategy with the SCAR-AKIS Strategic Working Group. Special attention should be given to the CEE countries where knowledge sharing attitudes and interconnectivity within the AKISs are still limited.

In order to achieve the objectives of the call, projects should have a minimum duration of four years and shall fall under the concept of the multi-actor approach. To network all public and private advisors across the EU, consortia shall include as many key actors – private and public – in the EU with practical advisory experience as possible. They should be engaged in a broad range of technical advisory subjects for a more sustainable and competitive agriculture and forestry.

Expected Impact:

Activities shall contribute to better interconnected advisors with a focus on innovation at national/regional level, able to support EIP-AGRI Operational Groups and Horizon 2020 multi-actor projects, by:

- improving networking and peer-to-peer learning of advisors, stimulating the interactive role of advisors to boost innovation and providing a set of best practices for advisors, thereby building an advisory network covering the EU in a balanced and comprehensive way;
- enhancing the impact of advisors on the strengthening of knowledge flows between scientific research and practical implementation for more productive and sustainable agricultural practices and rural development;
- improving education by developing efficient material and dedicated training systems for advisors that help to preserve practical knowledge in the long-term, and by delivering a substantial number of “practice abstracts” in the common EIP-AGRI format, including audio-visual material.



SOCIETAL CHALLENGE 3: Secure, Clean and Efficient Energy

CALL - Building a low-carbon, climate resilient future: secure, clean and efficient energy

Energy Efficiency

Topic ID and title	<u>LC-SC3-EE-1-2018-2019-2020: Decarbonisation of the EU building stock: innovative approaches and affordable solutions changing the market for buildings renovation</u>				
Budget	EUR 9 million EUR 12 million	Opening date	25 January 2018 24 January 2019	Deadline 1	04 September 2018 03 September 2019
Type of action	Innovation Action (IA)				
FTP subsector	Woodworking				
FTP SRA	4.1 Building with wood	FTP relevance	high		
	4.2 Indoor environment and functional furniture		medium	?	
			low		

Specific Challenge:

The market for deep renovation of buildings needs to be transformed in terms of technologies, processes and business models. The multiple benefits of improved energy efficiency are well known, but more action is needed for Europe to achieve the higher rates of renovation that would reduce energy use and decarbonize the building stock in order to meet long-term climate and energy targets. In particular, deep renovations need to become more attractive to all relevant stakeholders, more reliable in terms of performance, less disruptive for occupants (especially in residential buildings), less time-consuming, less energy-intensive from a life cycle perspective, more environmentally friendly regarding applied materials and more cost effective. There is a need to demonstrate and roll out holistic consumer-centred solutions that involve the whole value chain, ensuring high levels of comfort and a high quality of the indoor environment.

Scope:

Proposals should demonstrate solutions addressing building fabric and/or technical systems that ensure faster and more cost-effective deep renovations that result in high energy performance. Proposals should include innovations in technology and in design and construction methods with low embodied energy and on-site works organisation, industrialization and lowering cost of energy retrofitting and they should take into account any architectural constraints. They should also include innovations in business models and the holistic integration of disciplines across the value chain. Proposals should also consider energy efficient and low carbon solutions to retrofit building-level heating and cooling systems and the integration of on-site renewable energy generation, energy storage systems which allow for optimisation and flexible consumption, and, if relevant, integration with district heating and cooling systems. Proposals could address drivers of building renovation



that go beyond a desire to reduce energy consumption and related energy costs. For example, decisions to renovate may sometimes coincide with structural repairs. They could also consider further development and improvement of hybrid energy systems using fossil fuel based heating systems coupled with RES based heating systems as well as the integration of highly-efficient buildings and local energy system solutions such as District Heating and Cooling, including hybrid solutions. Solutions should include quick and simple installation of components and systems, minimizing disruption for building occupants and the time spent on site. Proposals should include monitoring and displaying of real time energy performance and other relevant data and consider the ways in which consumers and others could access and make use of such information. Solutions should ensure high levels of occupant comfort (thermal, visual and acoustic) and indoor environmental quality (e.g. air quality, humidity) if possible based on bio-based materials, as well as low risk of moisture-related problems, summer overheating and other harmful unintended consequences, and should address the multiple benefits of energy efficiency. Proposals should demonstrate solutions that aim for large scale roll-out according to defined business models and financial schemes for owners.

Projects are expected to bring the technology to TRL level 8-9. This topic contributes to the roadmap of the Energy-efficient Buildings (EeB) cPPP.

Expected Impact:

Proposals are expected to demonstrate the impacts listed below using quantified indicators and targets wherever possible:

- Primary energy savings triggered by the project (in GWh/year);
- Investments in sustainable energy triggered by the project (in million Euro);
- High energy performance in the renovated buildings;
- Measurable cost reduction compared with a typical renovation (i.e. a renovation that meets current minimum requirements of existing building regulations) or major energy performance improvement at comparable cost;
- Reduction of time needed on site for renovation works by 20% compared to current national standard practice;
- Demonstration of the effectiveness and replicability of the proposed solutions to lead to an increased rate of renovation for defined building typologies in several districts/cities/regions. Additional positive effects can be quantified and reported when relevant and wherever possible;
- Reduction of the greenhouse gases emissions (in tCO₂-eq/year) and/or air pollutants (in kg/year) triggered by the project.



Topic ID and title	LC-SC3-EE-3-2019-2020: Stimulating demand for sustainable energy skills in the construction sector				
Budget	EUR 6 million	Opening date	24 January 2019	Deadline 1 Deadline 2	03 September 2019
Type of action	CSA Coordination and support action				
FTP subsector	Woodworking				
FTP SRA	No correspondence (skills)			FTP relevance	high
	(4.1 Building with wood)				medium
					low

Specific Challenge:

Based on results of the BUILD UP Skills initiative, in particular the National Qualification Platforms and Roadmaps, as well as the qualification and training schemes developed in various Member States, the challenge is now to act at market level and to support legislative changes that will stimulate the demand for energy skills. The objective is to increase the number of skilled building professionals and/or blue collar workers across the building design, operation and maintenance value chain (designers, architects, engineers, building managers, technicians, installers, blue collar workers including apprentices, and other building professionals), with a specific focus on the engagement of SMEs. Recourse to skilled professionals/workers both for renovations and new constructions of buildings and district scale solutions should be made more attractive and easier for companies and home owners alike.

Scope:

The focus of submitted proposals should be on the direct stimulation of demand for energy skills in construction. This is calling for the development, up-scaling and combination of a range of tools and initiatives, e.g.:

- Tools facilitating the mutual recognition of energy skills and qualifications in the construction sector: development of sustainable energy skills passports/registers for workers at regional/national level and support for their take up at EU level, mobile applications facilitating the comparison of workers' skills and qualifications between countries (e.g. by enabling the direct comparison of learning outcomes);
- National, regional or local initiatives raising awareness of home and building owners and tenants about the benefits of sustainable energy skills and providing financial incentives for renovations done using skilled workers/professionals;
- Support to public authorities for the development of new legislative frameworks, e.g. requirements for skilled workers in public procurement;
- Partnerships with producers and retailers of construction products (e.g. DIY stores) to raise awareness of the salesforce and of consumers about energy efficient products, skilled workers and good practice in construction/renovation;



- Initiatives reinforcing the link between skills/education and energy performance/quality of construction e.g. tools showing the reduction of the performance gap as result of an increase quality of the works.

Proposals need to be focused and are not necessarily required to address the whole range of professions and crafts involved in the building sector. They may however consider the entire design chain (e.g. manufacturers). If the proposal addresses specifically design, material life cycles and embodied energy shall be considered. Adequate consideration should also be given to improved appreciation of the end user's needs including the quality of indoor environment (thermal and visual comfort, acoustics, air quality, etc.) as well as improved operation and maintenance.

Expected Impact:

Proposals are expected to demonstrate, depending on the scope addressed, the impacts listed below using quantified indicators and targets wherever possible:

- Primary Energy savings triggered by the project (in GWh/year) Measurable energy savings and/or renewables production resulting from improved skills;
- Investments in sustainable energy triggered by the project (in million Euro);
- Increased number of certification schemes for energy efficiency skills;
- Improved mutual recognition of sustainable energy skills between Member States and neighbouring countries;
- Improved collaboration and understanding across different trades and professional groups;
- Increased market acceptance of sustainable energy skills;
- Legislative changes stimulating the demand for energy skilled construction workers/professionals;
- Demonstrated reduction in the gap between designed and actual energy performance through improved quality of construction.

It is expected that this topic will continue in 2020.



Global Leadership in renewables

Topic ID and title	LC-SC3-RES-4-2018: Renewable energy system integrated at the building scale				
Budget	EUR 27,5 million	Opening date	31 October 2017	Deadline 1 Deadline 2	31 January 2018 23 August 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Woodworking				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

An increased penetration of renewable energy in the energy mix and the decarbonisation of the heating sector are amongst the most important priorities set in the Energy Union Strategy. To this aim, solutions that integrate several technologies based on one or more renewable energy sources (and their combination with energy storage systems where necessary) should be made available and the highest possible share of renewable energy should be achieved. This integration requires innovative approaches, due consideration of the implications for the user and a proper assessment of the cost-effectiveness. This specific challenge is in line with the objectives of the SET-Plan, of Innovation Challenge n. 7 ("Affordable Heating and Cooling of Buildings") of Mission Innovation and the roadmap of the Energy-efficient Buildings cPPP.

Scope:

The proposal will provide a combination of different renewable energy technologies to cover the highest possible share of electricity, heating and cooling needs of a multi-family residential or commercial or public or industrial building (in the case of the industrial building, the project is not expected to address the energy needs of the industrial process). Since the final application will be operated by users and installed by installers, their needs and requirements (e.g. in terms of space that the users are willing to provide for the installation of the different components of the system) shall be taken into account and the relevant expertise in terms of social sciences and humanities has to be included in the consortium. Attention should be paid to reducing emissions of air pollutants.

Proposals are expected to bring the integrated technologies solutions from TRL 3-4 to TRL 4-5.

Expected Impact:

The project is expected to develop solutions that will reduce the dependence on fossil fuels for providing electricity, heating and cooling in buildings. Cost competitiveness with traditional solutions is expected to be achieved by 2025 considering also the effect of economies of scale.



Topic ID and title	LC-SC3-RES-11-2018: Developing solutions to reduce the cost and increase performance of renewable technologies				
Budget	EUR 30 million	Opening date	31 October 2017	Deadline 1 Deadline 2	31 January 2018 23 August 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Pulp, paper & processing – Woodworking				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Achieving or maintaining global leadership in renewable energy technology requires that the innovative solutions are also affordable. Therefore, cost reductions remain a crucial necessity for existing or new technologies. This specific challenge is in line with the sectorial cost reduction targets stated in the respective Declarations of Intent of the SET Plan, where applicable.

Scope:

Proposals will address one or more of the following issues:

g) Bioenergy: Improve small and medium-scale combined heat and power (CHP) from biomass to reduce overall costs of investments and operation through achieving at the same time high resource efficiency and high overall and electrical conversion performance.

Proposals are expected to bring technologies from TRL 3-4 to TRL 4-5.

Beside the development of the technology, the proposal will have to clearly address the following related aspects where relevant: potentially lower environmental impacts, issues related to social acceptance or resistance to new energy technologies, related socioeconomic issues.

Expected Impact:

The proposed solution will reduce the CAPEX and/or OPEX of energy generation from any of the mentioned renewable sources making it comparable to generation costs from competing fossil fuel sources.



Topic ID and title	LC-SC3-RES-12-2018: Demonstrate highly performant renewable technologies for combined heat and power (CHP) generation and their integration in the EU's energy system				
Budget	EUR 30 million	Opening date	31 October 2017	Deadline 1 Deadline 2	13 February 2018
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing – Woodworking				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Progressive replacement of fossil fuels used in the heat and power sectors by means of renewable energy sources can increase energy security, energy price stability as well as independence from imported sources. However, to unlock the full potential of renewable heat and power solutions to significantly contribute to the energy system, improvement of individual technologies performance and their incorporation into the energy system is needed.

Scope:

Proposals will address one of the following sub-topics:

- **Biomass based combined heat and power (CHP):** Demonstration of technically feasible and cost-effective installation of medium to large-scale CHP through retrofitting of existing fossil-fuel driven CHP or power plants, as such plants are already integrated in the energy grid. Project will address the transformation of existing fossil fuel power plants >10 MW electrical to CHP plants with the use of sustainable biomass feedstock. Transformations have to demonstrate their overall cost benefits over new biomass-based CHP installations and show at least their state-of-the-art requirements for continuous operation and prove advances in combustion emission reduction. Commercial operation of the plant with biomass after the end of the project is to be envisaged.

The proposals are expected to bring the technology from TRL 5 to TRL 7-8.

Expected Impact:

The successful demonstration of the proposed solutions will reduce the cost of combined heat and power generation from renewable sources, making it competitive to alternative fossil fuel based solutions. The proposed solutions are expected to lead to subsequent commercial industrial projects, thus increasing the EU industrial capacity for renewable power and heat generation at a lower installation cost. This will allow decarbonisation of the power and heat sector.



Topic ID and title	LC-SC3-RES-16-2019: Development of solutions based on renewable sources that provide flexibility to the energy system				
Budget	EUR 15 million	Opening date	07 May 2019	Deadline 1 Deadline 2	27 August 2019
Type of action	RIA Research and Innovation action				
FTP subsector	All sectors				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Supporting the balancing of the power grid and increasing the flexibility of the energy system is possible through dispatchable renewable energy sources, such as for example bioenergy and hydropower. The specific challenge is to increase the potential and performance of dispatchable technologies to provide flexibility services to the energy system by improving their technological characteristics.

Scope:

Proposals will address one of the following sub-topics:

- Bioenergy carriers: Development of intermediate bioenergy carriers for energy and transport from biogenic residues and wastes and energy crops from marginal lands not applicable to food or feed production through feedstock flexible technologies at a conversion cost reduced by at least 25% from the state-of-the-art, excluding the feedstock cost, and with increased energy density, storage and trade characteristics, where relevant, and improved GHG performance. The state-of the art for conversion costs per technology will be clearly presented in the proposal with cost figures and versatility of use where appropriate.

Expected Impact:

The increased flexibility of the energy system will allow the penetration of a higher share of variable output renewables in the energy mix without affecting system stability.



Topic ID and title	LC-SC3-RES-17-2019: Demonstration of solutions based on renewable sources that provide flexibility to the energy system				
Budget	EUR 40 million	Opening date	05 September 2018	Deadline 1 Deadline 2	11 December 2018
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing – Woodworking				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Supporting the power grid balancing and increasing the flexibility of the energy system is possible by means of dispatchable renewable energy sources. The specific challenge is to increase the potential of renewable dispatchable technologies in providing flexibility to the energy system. Different technologies are suitable to address this challenge.

Scope:

Proposals will address one of the following sub-topics:

- **Intermediate bioenergy carriers:** Focus will be on the demonstration of the most cost-efficient intermediate bioenergy carrier pathways for energy and transport, which improve the economic viability of the subsequent energy production by addressing solid, liquid and gaseous intermediate bioenergy carriers from biogenic residues and wastes with increased energy density, storage and trade characteristics where relevant. Reduced conversion costs and improved energy efficiency and GHG performance of the intermediate bioenergy carrier pathway will be demonstrated. Production at a scale of up to 5000 tons and process feasibility through applications to fuel production including for the heavy duty, maritime and aviation sectors, as well as to combined heat and power generation, are to be included.

Proposals are expected to bring the technology from TRL 5 to TRL 7.

Expected Impact:

The developed technologies will allow plant and system operators to operate successfully in the modern power markets and to make a significant contribution to European renewable energy objectives and policies.



Topic ID and title	LC-SC3-RES-22-2018: Demonstration of cost effective advanced biofuel pathways in retrofitted existing industrial installations				
Budget	EUR 20 million	Opening date	05 December 2017	Deadline 1 Deadline 2	05 April 2018
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
					medium
					low

Specific Challenge:

Commercialization of advanced biofuels depends on up-scaling of the technologies. The specific challenge is to overcome the high cost and high risk of the installation of industrial plants for advanced biofuels. This challenge is in line with priorities identified in the context of the SET-Plan for commercialization of advanced biofuels.

Scope:

Proposals will demonstrate cost-efficient advanced biofuel pathways which improve the economic viability and reduce capital expenditure (CAPEX) and operating expenses (OPEX). This is to be done through retrofitting of existing industrial installations with necessary innovation specific to the proposed advanced biofuel pathway. Proposals will address integration in first generation biofuels sites, in pulp and paper industry or in existing fossil refineries with production of advanced biofuels at a scale of a few thousand tons through upgrading the existing sites with innovative installations. The economic feasibility and other socio-economic benefits including the impact on current first generation sites will be included and clearly demonstrated. Proposals will provide information about the expected CAPEX and OPEX improvements.

Proposals are expected to bring the technology from TRL 5 to 7.

Expected Impact:

The supported projects are expected to increase the industrial installed capacity for advanced biofuels, and show the socio-economic benefits.



Topic ID and title	LC-SC3-RES-28-2018-2019-2020: Market Uptake support				
Budget	EUR 15 million EUR 15 million	Opening date	31 October 2017 05 September 2018	Deadline 1	13 February 2018 11 December 2018
Type of action	CSA Coordination and support action				
FTP subsector	Pulp, paper & processing – Woodworking				
FTP SRA	3.2 Renewable energy solutions	FTP relevance		high	
				medium	
				low	

Specific Challenge:

Since the adoption of RES Directive in 2009, most Member States have experienced significant growth in renewable energy production and consumption, and both the EU and a large majority of Member States are on track towards the 2020 RES targets. The "Clean Energy for all Europeans" package adopted at the end of 2016 introduces further targets towards 2030 and introduces modifications in the energy market design that will empower individuals or communities to participate actively to the energy system transformation. Renewable energy technologies have the opportunity to play a crucial role in this transition, leading to an increased share of renewable energy consumed in the EU and to a more active role for the consumers. However, introducing and deploying at large scale new and improved technologies entails a number of challenges, notably as regards their initial high cost, the consumer acceptance and the legal and financial barriers arising from bringing novel solutions to a technical environment with already reliable solutions in place.

Scope:

The proposal will develop solutions which can be easily implemented for overcoming barriers to the broad deployment of renewable energy solutions. In particular, the proposal will address one or more of the following issues:

- Recommendation for harmonisation of regulations, life cycle assessment approaches, environmental impact methodologies of renewable energy solutions;
- Development of additional features for RES to be compliant with the electricity market requirements, making them "market fit", such as developing the possibility to provide additional services to the grid such as peak power and having an active role in electricity balancing/reserve market;
- Support sharing of best practice between public funding bodies for the cross-border participation in RES electricity support schemes, increasing the use of the "RES co-operation mechanisms" foreseen in the legislation;
- Development of insurance schemes to be available to developers in Europe and worldwide to mitigate risks, such as in geothermal drilling and offshore installation;
- Development of innovative financing mechanisms, schemes and sharing of best practices for cost-effective support for uptake of renewable sources, such as through the use of Public Procurement of Innovative Solutions instrument or smartly designed tenders;



- Development of support tools to facilitate export markets, especially for technologies where export market potential is much higher than internal market e.g. for hydropower. The focus will be on capacity building for market activities in developing and emerging countries, including identifying research needs, within the objectives of developing country- specific technologies and solutions, and/or adapting existing ones, taking into account local aspects of social, economic and environmental sustainability. Participation of developing and emerging countries is encouraged, in particular if these countries have identified energy as a priority area for their development and whenever common interest and mutual benefits are clearly identified.
- Development of tools (methods and models) for environmental impact assessments of renewable energy projects;
- Development of tools or services using global earth observation data, (such as those available through COPERNICUS), to support development and deployment of renewable energy sources;
- Determining conditions and defining options for retrofitting existing energy and industrial installations (first generation biofuels, pulp and paper, fossil refineries, fossil firing power and Combined Heat and Power (CHP) plants) for the complete or partial integration of bioenergy, with concrete proposals for such retrofitting for the different cases of bioethanol, biodiesel, bio-kerosene, intermediate bioenergy carriers and other advanced biofuels and renewable fuels and biomass based heat and power generation, on the basis of the assessment of the capital expenditure (CAPEX) reduction and market benefit;
- Development of optimisation strategies regarding cost, energy-performance and LCA for bioenergy and sustainable renewable fuels in upgraded energy and industrial installations;
- Development of cost-effective logistics, feedstock mobilisation strategies and trade-centres for intermediate bioenergy carriers.

Expected Impact:

- Facilitate the introduction of these technologies and increase the share of renewable energy in the final energy consumption;
- Lead to substantial and measurable reductions for project developments, whilst still fully addressing the needs for environmental impact assessments and public engagement;
- Develop more informed policy, market support and financial frameworks, notably at national, regional and local level, leading to more cost effective support schemes and lower financing costs for RES facilities.

It is expected that this topic will continue in 2020.



SOCIETAL CHALLENGE 5 – Climate action, environment, resource efficiency and raw materials

CALL - Building a low-carbon, climate resilient future

Topic ID and title	LC-CLA-02-2019: Negative emissions and land-use based mitigation assessment				
Budget	EUR 22 million	Opening date	14 November 2018	Deadline 1 Deadline 2	19 February 2019 04 September 2019
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high
					medium
					low

Specific Challenge:

Most low-carbon pathways leading to well below 2°C (or 1.5°C) stabilisation of the global temperature – in line with the Paris Agreement goals – include negative emissions to compensate for residual emissions and/or temperature overshoot and highlight the critical role of land-use based mitigation. There is therefore a need to quantitatively assess the potential, effectiveness and impacts of negative emission technologies/practices and of land-use mitigation options, in achieving the long-term goals of the Paris Agreement, as well as linking these to what it would mean for concrete policy challenges.

Scope:

Actions should address only one of the following sub-topics:

a) Feasibility of negative emissions for climate stabilisation: Actions should assess the potential, effectiveness, efficiency, risks and costs of existing and emerging negative emission technologies and practices for climate stabilisation and their impact on: land, subsurface, water, oceans and other resources, bio-diversity, human safety, food security, ecosystems and their ability to deliver services to society, including implications for resilience, sustainability, feedbacks on climate and the global carbon cycle, and other relevant issues. Actions should also cover the issue of public acceptance and explore the international governance requirements associated with large-scale deployment of negative emission technologies and practices.

b) Land-based mitigation: Actions should provide a comprehensive analysis of various land-use based mitigation options at the global and regional level, assessing their potential and effectiveness in providing large-scale reductions of greenhouse gases, in the context of trade-offs and/or co-benefits in relation to other pressures and goals (e.g. food, energy and water security, biodiversity) and should analyse feedbacks between land-use based mitigation and climate change impacts. Actions should also improve current methodologies



to estimate emissions and removals associated with land use measures, also by leveraging observations from GEOSS and in particular the Copernicus programme.

Expected Impact:

- Major international scientific assessments such as the IPCC reports and the IPBES, as well as to national and EU impact assessments of possible mitigation options;
- Developing a comprehensive medium-to-long term vision and analytical framework on pathways to achieve climate neutrality in the perspective of reaching the PA goals;
- Improved ex-post, spatially explicit monitoring of the mitigation performance of the land sector;
- Enhanced international cooperation.



Topic ID and title	LC-CLA-06-2019: Inter-relations between climate change, biodiversity and ecosystem services				
Budget	EUR 25 million	Opening date	14 November 2018	Deadline 1	19 February 2019
				Deadline 2	04 September 2019
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry				
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high
	2.2 Forest ecology and ecosystem services				medium
					low

Specific Challenge:

The Paris Agreement notes the importance of taking action to ensure the integrity of all ecosystems and the protection of biodiversity in the context of combatting climate change and adapting to its impacts. An improved understanding of the interactions and feedbacks between ecological processes and climate change, together with evidence-based guidance, is crucial for the development of appropriate solution-oriented strategies and measures for biodiversity conservation and cost-effective ecosystems-based climate change adaptation and mitigation. Furthermore, there are opportunities to let biodiversity and ecosystems benefit multidimensionally from climate change adaptation and mitigation, because intelligent climate policy can simultaneously reduce other environmental stresses, such as air pollution.

Scope:

Actions should investigate at all relevant spatial and temporal scales the way that ecological processes, biodiversity (including terrestrial and/or marine ecosystems as appropriate) and ecosystem services are impacted, both directly and indirectly, by climate change. Actions should consider the interactions and feedbacks between climate change and biodiversity, ecosystem functions and services. The vulnerability of biodiversity and ecosystems functions and services to climate change should be investigated and modelled across a range of European (including other European territories) climatic and ecological regions; this includes human activities with relevance to climate change. They should account for social, ecological and economic aspects and climate change relevant stressors and sources of uncertainty. These should include tipping points and safe operating spaces. The role of nature-based solutions in enhancing the efficiency and effectiveness of climate change adaptation and mitigation strategies should be assessed and synergies with other pollution-reducing environmental policies be explored. Work should build, as appropriate, on existing knowledge and activities such as relevant FP7/Horizon 2020 projects, European climate adaptation platforms and Copernicus Services, in particular on climate change, land monitoring and marine environmental monitoring, and contribute to long-term monitoring initiatives.

Expected Impact:



- More effective, integrated and evidence-based biodiversity conservation strategies and ecosystem management in the face of climate change;
- Pushing the EU to the forefront in climate-change predictive capacity through models better accounting for the interactions and feedbacks between biodiversity, ecosystems and the climate system;
- More effective ecosystem-based adaptation and mitigation, through evidence-based design and implementation of systemic nature-based solutions;
- Enhanced ecosystem integrity, functionality, resilience and delivery of services;
- Increased investment in nature-based solutions, and ecosystem conservation, restoration and management, to support climate change adaptation and mitigation strategies;
- Underpinning the EU Nature Directives, EU Biodiversity Strategy, 7th Environment Action Programme, and the EU Strategy on adaptation to climate change;
- Informing major international scientific assessments such as the IPCC reports and the IPBES;
- The protection, restoration and enhancement of natural capital in line with the work of the Convention on Biological Diversity (CBD), the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), the Intergovernmental Panel on Climate Change (IPCC) and further relevant global processes and organisations.



Topic ID and title	LC-CLA-15-2020: Nature Based Solutions for Forest Fires					
Budget	EUR million	Opening date		Deadline 1	Deadline 2	
Type of action						
FTP subsector	Forestry					
FTP SRA				FTP relevance	high	
					medium	
					low	

The details of the Call topic not yet available



CALL – Greening the economy in line with the Sustainable Development Goals

Topic ID and title	CE-SC5-01-2018: Methods to remove hazardous substances and contaminants from secondary raw materials				
Budget	EUR 34 million	Opening date	07 November 2017	Deadline 1	27 February 2018
				Deadline 2	04 September 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Pulp, paper & processing - Woodworking				
FTP SRA	2.5 Cascade use, reuse and recycling systems			FTP relevance	high
	3.4 Biorefinery concepts				medium
					low

Specific Challenge:

Reuse and recycling of many secondary raw materials continues to be low in the EU, while landfill and incineration rates remain high. The uptake and recyclability of secondary raw materials can be hampered by the presence of undesirable contaminants, additives and even substances of concern. The removal of such undesirable substances could improve the purity of the resulting secondary raw material and mitigate potential health and environmental concerns. In addition, the removal of these substances could increase the range of potential recycling and reuse applications for the secondary raw materials.

Scope:

Actions should develop innovative solutions for removing undesirable substances from secondary raw materials. The substances in question could be those posing health or environmental risks and/or those whose presence could adversely affect the quality of the secondary raw material. The safe utilisation or disposal of substances thus removed should be addressed as well. Proposals are expected to provide evidence of the potential market impact that the proposed solutions could bring, including quantitative information on the size of the targeted market. The economic feasibility and overall environmental performance of the proposed solution should also be considered. The work should also produce recommendations on the design and manufacturing of materials for recyclability and for standardisation. Actions should be tackled by a multidisciplinary consortium, with significant participation of industry partners and recyclers. Participation of SMEs is desirable. Activities are expected to achieve TRL 5-6 by the end of the project.

Expected Impact:

- Increased purity and/or desirable quality of secondary raw materials;
- An increased recycling rate for, and reduced landfill and incineration of secondary raw materials;
- Reduced risk of retaining hazardous substances in recycled materials, where relevant;
- The implementation of the EU Circular Economy Action Plan and the 7th Environment Action Programme;
- The Commission Strategy on Plastics in a Circular Economy and to the implementation of the SPIRE PPP Roadmap, where relevant.



Topic ID and title	CE-SC5-05-2018: Coordinated approaches to funding and promotion of research and innovation for the circular economy				
Budget	EUR 2 million	Opening date	07 November 2017	Deadline 1 Deadline 2	27 February 2018
Type of action	CSA Coordination and support action				
FTP subsector	All sectors				
FTP SRA	1.3 Policies and good governance			FTP relevance	high
					medium
					low

Specific Challenge:

Authorities throughout the EU continue to fund research and innovation in the field of circular economy at a national or regional level. Programme owners do so on the basis of their own mandates, though doubtlessly to a large extent in accordance with national and European priorities. Nevertheless, fragmentation of scarce resources, difficulties in implementing international synergies without a joint platform and lack of institutionalized outreach throughout Europe all hamper progress towards achieving common EU objectives. Moreover, the progress made in research and innovation underpinning circular economy varies throughout the EU.

This calls for a strategic approach to the coordination of objectives and programming of the regional, national and European funding programmes throughout the area of research and innovation for a circular economy. A strategic approach would help build international synergies among programme owners (in order to overcome and avoid fragmentation), and strengthen dissemination of lessons learned and new solutions for the circular economy resulting from currently isolated national programmes and funding.

Scope:

The action should establish a joint platform which will formulate, based on a thorough understanding of the state-of-the-art, the research and innovation needs and priorities for circular economy development in the EU. To this end, this action should bring together national and regional programme owners which will adequately represent the diversity of conditions and approaches from around the EU. The action should encompass joint development of objectives, priority setting, impact assessment, and programme and project organisation. It should produce a Strategic Research and Innovation Agenda, summarising recommendations for research priorities and coordinated programming and funding mechanisms. Innovation involving SMEs should be explicitly addressed. The action should disseminate best practices and promote multinational research and innovation actions within national and regional programmes. It should also include a mechanism whereby it could draw from the expertise and experience of leading research organisations as well as industry and civil society organisations. It should seek cooperation and synergies with relevant initiatives addressing the circular economy, including those funded by the EU.



Expected Impact:

- Alignment and coordination of regional, national and European programming of R&I in the area of the circular economy and associated environmental impacts;
- Effective regional, national and European R&I funding in the field of the circular economy, with special attention to SMEs;
- Accelerated diffusion of state-of-the-art circular economy solutions and best practices in circular economy R&I throughout Europe;
- Implementation of national and EU-level action plans including the Circular Economy Action Plan, the Green Action Plan for SMEs, and Eco-Innovation Action Plan.



Topic ID and title	<u>CE-SC5-07-2018-2019-2020: Raw materials innovation for the circular economy: sustainable processing, reuse, recycling and recovery schemes</u>				
Budget	EUR 20 million	Opening date	07 November 2017	Deadline 1	27 February 2018
	EUR 30 million		14 November 2018	Deadline 2	19 February 2019
					04 September 2018
					04 September 2019
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing - Woodworking				
FTP SRA	2.5 Cascade use, reuse and recycling systems			FTP relevance	high
	3.1 Resource efficiency in manufacturing				medium
	4.1 Building with wood				low

Specific Challenge:

Securing the sustainable access to raw materials, including metals, industrial minerals, wood- and rubber-based, construction and forest-based raw materials, and particularly Critical Raw Materials (CRM), is of high importance for the EU economy. Complex primary and secondary resources contain many different raw materials. Their processing, reuse, recycling and recovery schemes are complex and imply different steps, ranging from collection, logistics, sorting and separation to cleaning, refining and purification of materials.

The challenge for industry is to scale up promising raw materials production technologies and to demonstrate that raw materials can be produced in an innovative and sustainable way in order to make sure that research and innovation end up on the market, to strengthen the competitiveness of the European raw materials industries, meet ambitious energy and climate targets for 2030, minimise environmental impacts and risks, and gain the trust of EU citizens in the raw materials sector. This specific challenge addresses the development of "innovative pilot actions", which is one of the major targets of the European Innovation Partnership (EIP) on Raw Materials.

Scope:

Actions should develop and demonstrate innovative pilots for the clean and sustainable production of non-energy, non-agricultural raw materials in the EU from primary and/or secondary sources finishing at Technology Readiness Levels (TRL) 6-7. All actions should contribute to achieving the targets of the EIP on Raw Materials, particularly in terms of innovative pilot actions on processing and/or recycling for the innovative production of raw materials, and to building the EU knowledge base of primary and secondary raw materials by feeding into the EC Raw Materials Information System – RMIS.

Applying a circular economy approach throughout the entire value chain, actions for this multi-annual topic should address only one of the following sub-topics:



a) Sustainable processing and refining of primary and/or secondary raw materials

(2018, 2019): Actions should demonstrate new or improved systems integrating relevant processing and refining technologies for better recovery of minerals and metals at increased efficiency in terms of better yield and process selectivity as well as better utilisation of resources (hence reducing wastes). This would include processing of and recovery from low grade and/or complex ores and/or from industrial or mining wastes, and/or the reduction of the content of toxic elements or compounds in the resulting materials. The importance of the targeted raw materials and their sources for the EU should be demonstrated in the proposal. The solution proposed should be flexible enough to adapt to different or variable ore/secondary raw material grades and should be supported by efficient and robust process control. Where relevant, any solution proposed for the reduction of the content of toxic elements or compounds in the resulting materials should also include the appropriate management of the hazardous substances removed. Recycling of end-of-life products is excluded from this option.

b) Recycling of raw materials from end-of-life products (2018, 2019):

Actions should develop and demonstrate novel and environmentally sound solutions for a higher recycling and recovery of secondary raw materials from end-of-life products such as waste electrical and electronic equipment (WEEE), batteries, wood-based panels, multi-material paper packaging, end-of-life tyres, etc. These products can contain a multitude of minerals, metals, wood and wood-fibre, rubber, etc. (including critical raw materials and other technology metals).

c) Recycling of raw materials from buildings (2018, 2019):

Actions should develop and demonstrate novel solutions for a high-value recovery of raw materials from buildings. Actions should also benchmark against a series of comparative case studies of construction and demolition waste (C&DW) management in deconstruction of buildings of representative size categories in countries with different types of end-of-life building stocks, showcasing the appropriate use of the following: the EU C&DW Management Protocol, pre-demolition audit, smart demolition practices, using appropriate technical equipment, and sorting/processing and quality management of waste fractions such as metals, aggregates, concrete, bricks, plasterboard, glass, polymers and plastics and wood.

d) Advanced sorting systems for high-performance recycling of complex end-of-life products (2018, 2019):

Actions should develop and demonstrate innovative dismantling and sorting systems enabling functional recycling of critical raw materials, or other types of highly efficient recovery of metals, minerals or construction materials, from complex end-of-life products and scrap thereof. The advanced sorting systems should achieve very high throughput rates in order to allow their economically viable operation on the European market.



Expected Impact:

- Pushing the EU to the forefront in the area of raw materials processing and/or recycling technologies and solutions through generated know-how (planned patents, publications in high impact journals and joint public-private publications etc.);
- Improving significantly the economic viability and market potential that will be gained through the pilot, leading to expanding the business across the EU after the project is finished, as well as creating added value and new jobs in raw materials producing, equipment manufacturing and/or downstream industries;
- Unlocking a significant volume of various primary/secondary raw materials currently unexploited/underexploited within the EU, hence improving their 'circularity' in the economy;
- Improving significantly the health, safety and environmental performance throughout the whole life cycle considered, including better energy and water efficiency, a reduction in waste generation and wastewater and a better recovery of resources from generated waste or a better recovery and recycling of resources from complex end-of-life products;
- Additionally, only for sub-topic b) 'Recycling of raw materials from end-of-life products', in the shorter term, increasing measurably the efficiency and effectiveness (range, yield, quality and selectivity of recovered materials) of the exploitation of complex and heterogeneous secondary raw materials deposits ('urban mines') when compared to the state of the art;
- Additionally, only for sub-topic c) 'Recycling of raw materials from buildings', lead to wider application of smart demolition techniques, C&DW processing, quality assurance practices, traceability and standardization for secondary raw materials in the construction sector, thus improving the material and value recovery rate.



Topic ID and title	<u>CE-SC5-08-2018-2019-2020: Raw materials policy support actions for the circular economy</u>				
Budget	EUR 2 million EUR 3 million	Opening date	07 November 2017 14 November 2018	Deadline 1 Deadline 2	27 February 2018 19 February 2019
Type of action	CSA Coordination and support action				
FTP subsector	Woodworking				
FTP SRA	2.5 Cascade use, reuse and recycling systems	FTP relevance	high		
	4.1 Building with wood		medium		
	3.1 Resource efficiency in manufacturing		low		

Specific Challenge:

In order to secure the sustainable access to primary and secondary raw materials, including metals, industrial minerals, construction raw materials, wood, and particularly Critical Raw Materials (CRMs) for the EU economy, there is a need to tackle a number of specific non-technological challenges at local, regional, national, EU and global levels.

Illegal shipments of waste, both within the EU and to non-EU countries, and poor recycling have adverse effects on human health and the environment, create unfair competition for law abiding operators and give rise to the loss of valuable resources in the case of poor or no treatment. However, port authorities and enforcement authorities have limited resources to control the ever increasing amount of material shipped and this without blocking normal traffic. In addition, at the moment there is no distinction in customs codes between "new goods" and "second hand goods" which implies that illegal waste shipments are often disguised as "second hand goods".

Currently, at most only one third of waste wood is recycled, the rest being landfilled or incinerated and there are great differences between Member States in wood recycling performance. Increasing production costs combined with stagnating product prices in recent years have put pressure on the profit margins of the EU woodworking industries, mostly dominated by SMEs. There is a need for higher resource efficiency and increased use of recycled wood in wood processing that can provide measurable improvements in company profitability.

Scope:

Actions should address only one of the following sub-topics:

a) Voluntary scheme for certification of treatment facilities for key types of wastes

b) Resource efficiency in wood processing, recovery and recycling (2018): Actions should identify, assess and document existing practices in a representative set of EU Member States/Associated Countries and possibly third countries, and create a network to widely disseminate and transfer good practices covering both issues: resource-efficient wood



processing and wood waste recycling. Resource-efficient wood processing in the woodworking sector should improve companies' operational performance and hence the EU sector's overall competitiveness. Quality-oriented and cost-efficient wood waste collection systems, sorting and recycling, and design solutions should facilitate increased wood recycling together with increased product quality and market acceptance of recovered wood in new products. Involvement of relevant stakeholders across value chains is necessary, including wood processing industries, research & innovation institutes, woodworking products end-users, municipalities and other parties dealing with wood waste collection, sorting and recycling. Actions should also assess trade-offs between wood waste use for material and energy. This assessment should be based on life cycle analysis and all sustainability pillars, and consider impacts on sustainable forest operations and ecosystems integrity (for all major EU forest regions) and impacts of intra-EU trade. Proposals should include the participation of industrial SMEs, as far as possible.

c) Responsible sourcing of raw materials in global value chains (2019)

Expected Impact:

The project results of the sub-topic b) are expected to contribute to:

- achieving the objectives and the implementation of the EU Forest Strategy, Circular Economy Action Plan and the EIP on Raw Materials on resource-efficient use of resources;
- improving knowledge and conditions for efficient wood processing when compared to the state of the art, resulting in increased competitiveness of the EU woodworking industries;
- increased wood waste recycling across the EU (including from furniture, construction and demolition, packaging, household) and increased acceptance in the use of secondary wood;
- better informed decision-making at EU, national and local levels in the private and public sectors on wood recycling and resource efficiency; and improved knowledge of EU stakeholders about proposed solutions, including authorities involved in wood recycling;
- in the medium and long term, creating added value and new jobs and increasing the overall competitiveness of the EU woodworking industries and related value-chains through an uptake of resource-, water- and energy-efficient solutions;



Topic ID and title	<u>SC5-11-2018: Digital solutions for water: linking the physical and digital world for water solutions</u>				
Budget	EUR 14 million	Opening date	07 November 2017	Deadline 1	27 February 2018
				Deadline 2	04 September 2018
Type of action	IA Innovation action				
FTP subsector	Pulp, paper & processing				
FTP SRA	3.3 Sustainable water stewardship	FTP relevance		high	
				medium	
				low	

Specific Challenge:

Modern information and communication technologies (ICT) have provided today's society with a vast array of innovative capabilities to solve several challenges related to resource efficiency, climate change and sustainable development. Harnessing this technology within the water sector creates a more intelligent means of managing and protecting the planet's water resources and lays the foundation of a water-smart society. However, several challenges related to interoperability and standardisation, collection, protection and sharing of data between users, services and infrastructures, intelligent smart metering, integration with other systems, ICT governance and public awareness and acceptance, are hampering the potential of those technologies.

Scope:

Actions should develop and test new, robust and cybersecure systems, linking the physical and digital world to ensure tailored, water-smart solutions, to exploit the value of data for the water sector and to foster higher information transparency and accountability. They should cover various water management areas, cycles and value chains, based on an integrated approach of all water resources and water bodies. Actions should combine different types of advanced data and digital technologies in a multidisciplinary environment, including mobile technology, clouds, artificial intelligence, sensors, open source software and analytics. Aspects such as optimisation, prediction, diagnosis, microsystems, micro-/nano-sensors, modelling and visualisation tools, data management plans, assessment and real time monitoring for water quality and quantity, integrated water management, open data policies, enabling institutional frameworks, health issues, vulnerability to changing water conditions and disaster warnings and risk management should also be considered. Actions should capitalise on knowledge acquired through previous FP7/Horizon 2020 projects.

Activities are expected to focus on Technology Readiness Levels (TRLs) 5-7.

Expected Impact:

- The interoperability of decision support systems through the identification and use of ICT/water vocabularies and ontologies in view of developing or improving ICT/water standards;



- Improved decision making on water management, related risks and resource efficiency through increased real-time accuracy of knowledge;
- Maximising return on investments through reduced operational costs for water utilities, including reduced costs for water monitoring, improved performance of water infrastructures, and enhanced access to and interoperability of data;
- Enhanced public awareness on water consumption and usage savings;
- Market development of integrated and cyber-resilient ICT solutions and systems for smart water management, and opening up of a digital single market for water services.
- The implementation of the objectives of the EIP Water, especially, reducing the environmental footprint of the main water-dependant activities and improve their resilience to climate changes and other environmental changes.



Topic ID and title	SC5-14-2019: Visionary and integrated solutions to improve well-being and health in cities					
Budget	EUR 43 million	Opening date	14 November 2018	Deadline 1	19 February 2019	
				Deadline 2	04 September 2019	
Type of action	IA Innovation action					
FTP subsector						
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high	
	1.3 Policies and good governance				medium	
					low	

Specific Challenge:

It is estimated that by 2050 up to 70% of the world's population will be living in urban areas. Urbanisation affects human health and well-being through factors such as exposure to pollutants, including noise, disasters, stressors and diseases, urban density, lack of physical activity, degraded ecosystems and erosion of natural capital, which can be exacerbated by climate change. As acknowledge by the Habitat III New Urban Agenda, public spaces play a crucial role in urban interaction and systemic urban innovation and they need to be designed and managed sustainably and equitably to ensure that the way citizens produce, consume, commute and interact within the urban fabric has a positive impact on their health and quality of life, enhances resilience to disasters and climate change and reduces the environmental footprint of the cities. The systemic integration of social, cultural, digital and nature-based innovation in the design, development and governance of public space has a tremendous potential to transform these spaces into diverse, accessible, safe, inclusive and high quality green areas that increase well-being and health and deliver a fair and equitable distribution of the associated benefits.

Scope:

Actions should deliver visionary and integrated solutions (e.g. therapy gardens, urban living rooms, creative streets, city farms) at the intersection of social, cultural, digital and nature-based innovation to increase citizens' health and well-being in cities. These solutions should address social, cultural, economic and environmental determinants of health and well-being and support urban communities in reducing their exposure to climate-related risks, pollution (including noise), environmental stress and social tensions, including the negative effects of gentrification.

Actions should also demonstrate how the integration of these solutions into innovative land-use management, urban design and planning could reduce health-related environmental burdens in socially deprived neighbourhoods, foster equitable access for all to public spaces, enhance their quality and use and promote sustainable urban mobility patterns.

Actions should test new transition management approaches, governance models, legal frameworks and financing mechanisms to re-design public spaces and urban commons and



assess their contribution to improving health and well-being. They should promote multi-stakeholder initiatives, citizens' engagement, co-creation and co-ownership of public spaces. Optimal and cost-effective use of behavioural games, networks of sensors, GIS-mapping, big data, observational programmes such as Copernicus and GEOSS, and citizens' observatories should be made as appropriate to enable the integration and visualisation of data for more effective monitoring of the transition towards healthier and happier cities.

To enhance the impact and promote upscaling and replication of these solutions, projects should engage in substantial networking and training actions to disseminate their experience, knowledge and deployment practices to other cities beyond the consortium. To enhance impact cooperation and synergies with the activities undertaken within the Global Covenant of Mayors for Climate and Energy initiative and its regional components (supported by the EC) should be sought where appropriate.

Funded projects are expected to establish long-term sustainable data platforms securing open, consistent data about the impacts of the deployed approaches and ensure interoperability with other relevant data infrastructures for effective communication, public consultation, exchange of practices, and sharing of experiences.

Expected Impact:

- High quality, multifunctional, public spaces able to integrate digital, social, cultural and nature-based innovation to enhance health and well-being, while ensuring 'the right to the city' as specified in the Habitat III New Urban Agenda;
- European cities being world ambassadors of sustainable lifestyles, providing universal access to greener, safe, inclusive and accessible public spaces, also accounting for the gender dimension;
- Participatory approaches in re-designing and transforming public spaces to increase health and well-being in cities through innovative public-private-people partnerships (PPPPs);
- More comprehensive assessment of the sustainability and resilience of cities through the development of health and well-being indicators;
- Establishing innovative monitoring systems to measure benefits and capture the multiple co-benefits created by nature-based solutions in terms of health and well-being.



Topic ID and title	SC5-18-2018: Valuing nature: mainstreaming natural capital in policies and in business decision-making				
Budget	EUR 7,7 million	Opening date	07 November 2017	Deadline 1 Deadline 2	27 February 2018
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.3 Policies and good governance	FTP relevance	high		
	2.2 Forest ecology and ecosystem services		medium		
			low		

Specific Challenge:

A broad range of economic activities are dependent upon natural capital, but natural assets are not unlimited. However, many ecosystem services and benefits to society and business, such as food provision, air and water filtration, disaster risk reduction, pollination, or climate regulation, are not visible because they are not priced on markets and hence not currently accounted for in socio-economic decision-making. Incorporating natural capital – and especially ecosystems – into national accounting systems as well as policy and business practices is needed to promote more resource efficient and sustainable choices, and to support smart, sustainable and inclusive growth.

Further to the work and progress at international level, important results have been achieved at European level under the initiative on Mapping and Assessment of Ecosystems and Services (MAES), as well as on categorising ecosystem services through the Common International Classification of Ecosystem Services (CICES). In addition, the KIP-INCA project aims to design and implement an integrated accounting system for ecosystems and their services in the EU. KIP-INCA aims to develop a comprehensive set of European-level natural capital accounts.

In addition, all businesses impact and depend on natural capital to some extent. The Natural Capital Protocol (NCP)[3] has been published as a framework to help generate robust and actionable information for business managers to inform decisions. National and corporate accounting is still in early phases of development and long-term coherence between these two strands of work is needed.

Scope:

Actions should address only one of the following sub-topics:

a) Valuing nature: developing and implementing natural capital and ecosystem accounts in EU Member States and Associated Countries

b) Operationalisation of natural capital accounting in business decisions: Actions should facilitate the implementation of the Natural Capital Protocol at corporate level. They should



therefore take stock of the work undertaken by ongoing initiatives, such as European and national platforms on business and biodiversity and the Natural Capital Protocol and should establish a “Valuing Nature Programme and Network”. The network should bring together work being undertaken by business in relation to natural capital and come up with optimal scientifically rigorous solutions for operationalising and mainstreaming natural capital, including nature-based solutions, green infrastructures and biodiversity, in companies' decision making frameworks and business models. It should aim to build a community of practice through an EU network of networks of businesses, administrations and academia, engaging key stakeholders from business, government, the knowledge and research community and civil society in open source collaboration. Together they should shape the business perception of the value of nature as a business opportunity and as a means of reducing economic risks and fostering sustainable businesses. This will also incentivise business investments in nature-based solutions. There is a need to stimulate early adoption, since potential first-movers may be risk-averse. This can be mitigated through life-long learning, training and guidance, and by demonstrating the benefits at corporate level.

Expected Impact:

- Mainstreaming natural capital and ecosystem services accounts at appropriate administrative or corporate levels;
- Decision-makers acknowledging the macro-economic and the micro-economic perspective of natural capital;
- Recognition of the value of natural capital and ecosystem services accounts, attracting private and public funding for further adoption;
- The acknowledgment, operationalising and mainstreaming of, and accounting for, natural capital, including nature-based solutions, and its wider value in public authorities and companies' decision making frameworks and business models.



Topic ID and title	SC5-21-2019-2020: ERA-NET Cofund action(s) for climate action, environment, resource efficiency and raw materials					
Budget	EUR 10 million	Opening date	14 November 2018	Deadline 1 Deadline 2	19 February 2019	
Type of action	ERA-NET-Cofund ERA-NET Cofund					
FTP subsector	All sectors					
FTP SRA	1.1 The performance of the sector in a perspective of global change			FTP relevance	high	
	1.3 Policies and good governance				medium	
					low	

Specific Challenge:

While Europe is making progress in reducing environmental pressures and addressing climate change challenges, current environmental policies and technology efficiency gains are not likely to be sufficient to address the substantial challenges it faces in protecting its natural capital, stimulating resource-efficient, low-carbon and climate-resilient economic and social development and safeguarding its population from environmental health risks. The challenge of underpinning and accelerating the transformation of our economy and society to achieve more sustainable development paths has a planetary scale. The UN's 2030 Agenda for Sustainable Development and the Paris Agreement on climate change have given new impetus to tackling these challenges at a global level.

Operating a systemic transformation for sustainable development requires the mobilisation of all relevant actors: public authorities at various levels, manufacturing industry and business at large, academia, research institutes, finance and insurance, non-governmental organisations and civil society. A properly aligned European Research Area, which is also open to the world, can make an essential difference in enabling a transformative sustainability agenda to take shape. The alignment of research and innovation agendas is therefore crucial in bringing about the necessary transformations.

Scope:

Proposals should pool the necessary financial resources from the participating national (or regional) research programmes with a view to implementing a joint call for proposals resulting in grants to third parties with EU co-funding in this area. Proposers are requested to include additional joint calls without EU co-funding as well as other activities such as the establishment or consolidation of a pan-European network of funding agencies and other key players in Europe, building on previous experience and avoiding overlaps with other initiatives, support to mutual learning and training, exchange of good practice, researcher mobility and equal opportunities (e.g. through EURAXESS) and better careers in the field. Wherever relevant, actions should involve social sciences and humanities.

Actions should focus on one of the following issues: emerging pollutants; international cooperation on disaster risk reduction and multi-hazard risk management, with emphasis on



environmental change; health, environment and climate change; conservation and protection of cultural heritage; biodiversity and climate change; conservation and restoration of degraded ecosystems and their biodiversity, including a focus on aquatic systems; enhancing urban transformation capacities/circular cities; sustainable supply of raw materials; next generation of climate science in Europe.

Synergies should be ensured with relevant public-public partnerships such as the JPI Water, JPI Climate, JPI Cultural Heritage and/or the BiodivERsA ERA-NET, as well as with international programmes such as the Belmont Forum, as appropriate. Participation of legal entities from international partner countries and/or regions is encouraged in the joint call as well as in other joint activities including additional joint calls without EU co-funding. Participants from this/these country/ies may request a Union contribution (on the basis of the ERA-NET unit cost) for the coordination costs of additional activities.

Expected Impact:

- Effective trans-national, pan-European research networking and synergies among national/regional and EU research programmes in the areas addressed;
- New knowledge-intensive products and services;
- Improved evidence-based policy through the interdisciplinary and trans-disciplinary science-policy interface and links with international efforts and fora on the areas addressed.

It is expected that this topic will continue in 2020.



H2020 Pillar: Excellent science

Excellent Science – European research infrastructures

CALL – Integrating and opening research infrastructures of European interest

Topic ID and title	<u>INFRAIA-01-2018-2019: Integrating Activities for Advanced Communities</u>				
Budget	EUR 101,5 million (full Call topic)	Opening date	05 December 2017	Deadline 1 Deadline 2	22 March 2018
Type of action	RIA Research and Innovation action				
FTP subsector	Forestry – All sectors				
FTP SRA	1.1. The performance of the sector in a perspective of global change	FTP relevance		high	
	1.3 Policies and good governance			medium	
				low	

Specific Challenge:

European researchers need effective and convenient access to the best research infrastructures in order to conduct research for the advancement of knowledge and technology. The aim of this action is to bring together, integrate on European scale, and open up key national and regional research infrastructures to all European researchers, from both academia and industry, ensuring their optimal use and joint development.

Scope:

An Integrating Activity will mobilise a comprehensive consortium of several key research infrastructures in a given field as well as other stakeholders (e.g. public authorities, technological partners, research institutions) from different Member States, Associated Countries and other third countries when appropriate, in particular when they offer complementary or more advanced services than those available in Europe. Funding will be provided to support, in particular, the trans-national and virtual access provided to European researchers (and to researchers from Third Countries under certain conditions), the cooperation between research infrastructures, scientific communities, industry and other stakeholders, the improvement of the services the infrastructures provide, the harmonisation, optimisation and improvement of access procedures and interfaces. Proposals should adopt the guidelines and principles of the European Charter for Access to Research Infrastructures.

To this extent, an Integrating Activity shall combine, in a closely co-ordinated manner:

- i. Networking activities, to foster a culture of co-operation between research infrastructures, scientific communities, industries and other stakeholders as appropriate, and to help develop a more efficient and attractive European Research Area;
- ii. Trans-national access or virtual access activities, to support scientific communities in their access to the identified key research infrastructures;
- iii. Joint research activities, to improve, in quality and/or quantity, the integrated services provided at European level by the infrastructures.

(a) 2018 deadline: Environmental and Earth Sciences

Research infrastructures for forest ecosystem and resources research. This activity aims at further integrating and facilitating broad access to forest research facilities, methodologies and data on genetic and species diversity to enable environmental and biological research including biological effects of air pollution, mitigation and adaptation to climate change, and development of forest management approaches. Emphasis will be on widening the user base and ensuring long term sustainability to the service integration.

Expected Impact:

- Researchers will have wider, simplified, and more efficient access to the best research infrastructures they require to conduct their research, irrespective of location. They benefit from an increased focus on user needs.
- New or more advanced research infrastructure services, enabling leading-edge or multidisciplinary research, are made available to a wider user community.
- Operators of related infrastructures develop synergies and complementary capabilities, leading to improved and harmonised services. There is less duplication of services, leading to an improved use of resources across Europe. Economies of scale and saving of resources are also realised due to common development and the optimisation of operations.
- Innovation is fostered through a reinforced partnership of research organisations with industry.
- A new generation of researchers is educated that is ready to optimally exploit all the essential tools for their research.
- Closer interactions between larger number of researchers active in and around a number of infrastructures facilitate cross-disciplinary fertilisations and a wider sharing of information, knowledge and technologies across fields and between academia and industry.
- For communities which have received three or more grants in the past, the sustainability of the integrated research infrastructure services they provide at European level is improved.
- The integration of major scientific equipment or sets of instruments and of knowledge-based resources (collections, archives, structured scientific information, data infrastructures, etc.) leads to a better management of the continuous flow of data collected or produced by these facilities and resources.
- When applicable, the integrated and harmonised access to resources at European level can facilitate the use beyond research and contribute to evidence-based policy making.
- When applicable, the socio-economic impact of past investments in research infrastructures from the European Structural and Investment Funds is enhanced.

The European Innovation Council - Pilot

SME Instrument

SME instrument Phase 1 / Phase 2

Topic ID and title	H2020-EIC-SMEInst-2018-2020: SME Instrument					
FTP Subsector	ALL	Opening date	Several in Phase I and/or Phase II (see below)	Deadline 1 Deadline 2	Several (see below)	
FTP SRA				FTP relevance	high	
	ALL				medium	
					low	

During the final three-year period of Horizon 2020, the SME Instrument will be operational under the Work Programme part of the **European Innovation Council (EIC) pilot**. The revised structure reflects the anticipated structure of the next EU Framework Programme for Research and Innovation (FP9). It is anticipated that this part of the work programme will support around 1000 projects that demonstrate a great potential to strengthen breakthrough innovations and boost the number of high-growth companies. The **overall budget of €2.7 billion** broadly reflects the multiannual funding profile of the constituent elements.

Target group: The SME Instrument addresses close-to-market and scale-up projects of a single SME or a consortium of SMEs established in EU Member States or Horizon 2020 associated countries. It is particularly aimed at people and companies who have ideas that are radically different from existing products or services on the market or under development, are highly risky, and require significant investments to get to market. A pilot phase for a European Innovation Council (EIC) will provide **support with no thematic restrictions** to innovative SME firms and entrepreneurs with the potential to scale up rapidly at European and global levels. The innovations must meet user and customer needs and tackle societal, technological and business challenges in a sustainable way. Market-creating innovations should take shape at the intersection between different technologies, industry sectors and scientific disciplines, linked to domains such as agriculture, energy, health, ICT, space and transport.

General conditions: The SME Instrument is very selective. Only the most convincing and excellent proposals can be funded after a thorough evaluation by multinational panels of technology, business and finance experts. In the pilot phase, there are no thematic restrictions.

Evaluation: Independent, expert evaluations of project proposals ensure that the quality of proposals and the teams behind them are rigorously assessed, with interviews now included



in a second step of the SME Instrument evaluation process.

The results of projects will be closely monitored. Performance indicators are the new products, services and processes for new markets being developed, private investment attracted during and after the project, and the turnover and employment of the companies that take part. These indicators will be gauged by reporting by the projects, by links to external databases on company performance, and by assessments by outside experts. For the latter, the EIC pilot will make use of the Innovation Radar, a tool to assess the market potential of innovations and the market readiness of innovators. The Innovation Radar will also help communicate the results to potential investors.

Principles and funding of the SME Instrument

Who can apply? For-profit SMEs, including young companies and start-ups, from any sector. You must be established in an EU Member State or a Horizon 2020 associated country.

What topics are covered? There are no set topics. Negative impacts on climate and the environment should be avoided.

How does it work? The SME Instrument provides full-cycle business innovation support. It has three phases, including a coaching and mentoring service.

Phase 1 – Feasibility study: Phase 1 funding is a lump sum of €50 000. Projects should last around 6 months.

Phase 2 – From concept to market: You can apply to Phase 1 as a means of preparing for Phase 2, or you can apply directly to Phase 2

Phase 3 – Commercialisation

Award criteria

Proposals are evaluated by experts on the basis of three award criteria:

- impact 50 %
- excellence 25 %
- quality and efficiency of implementation 25 %

To prepare for applying to an EIC pilot call, please go to the '[EIC pilot Web Page](#)', which will direct you to the most appropriate funding scheme for your needs.

Further information can be found [here](#).