Forest-based Sector
Technology Platform

HORIZON 2020 Call Topics 2016-2017

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

V.1. – 09/2016

Horizon 2020 Work Programme 2016-2017

Second round of funding: 2017

Following an update to the Work Programme (WP) 2017 of Horizon 2020, the European Commission announced an investment of €8.5 billion to be released in 2017 into research and innovation projects. The updated Work Programme builds on the existing cross-cutting themes of Horizon 2020 to date while introducing some novel initiatives. It is directly aligned with the current strategic policy priorities of the Commission including key actions supporting a strengthened Europe's industrial base and a forward-looking climate change policy. The revision releases the second round of funding from the 2016-17 Work Programme of Horizon 2020 adopted last October.

This FTP Manual provides a list of the most relevant Call Topics 2016-2017 for the forest-based sector in the current period. Each Horizon 2020 WP sets out the funding opportunities under the different WP Pillars through Calls for Proposals and other actions. Each Call for Proposals 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 research 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 2016-2017 of highest relevance for the sector are clustered under the following four pillars:

- Industrial Leadership
- 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

Proposals can be submitted through the Participant Portal. The complete list of Calls and further guidance on the open research date piloting are also published on the portal.

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	Calls	2017
Excellent Science Pillar		
European Research Council	4 calls	1767.00
Future and Emerging Technologies	3 calls	162.80
Marie Skłodowska-Curie actions	5 calls	840.20
European research infrastructures (including eInfrastructures)	5 calls	291.00
Industrial Leadership Pillar		
Information and Communication Technologies	2 calls	633.50
Nanotechnologies, Advanced Materials, Biotechnology and Production	2 calls	313.75
Space	3 calls	98.50
Access to risk finance	Financial instruments	397.50
Innovation in SMEs	2 calls	463.41
Societal Challenges Pillar		
Health, demographic change and wellbeing	2 calls	331.76
Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy	4 calls	416.44
Secure, clean and efficient energy	2 calls	526.89
Smart, green and integrated transport	3 calls	409.70
Climate action, environment, resource efficiency and raw materials	1 call	223.60
Europe in a changing world – inclusive, innovative and reflective Societies	4 calls	126.05
Secure societies – Protecting freedom and security of Europe and its citizens	3 calls	206.15
In addition		
Spreading excellence and widening participation	1 call	111.38
Science with and for society	1 call	55.05
Cross-cutting activities (Focus Areas)	3 calls	475.45

Source: http://europa.eu/rapid/press-release_MEMO-16-2604_en.htm Access on 07.09.2016

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.

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

Call Name:

Energy Efficient Buildings

Topic ID and title	EEB-05-2017 – Development of near zero energy building renovation					
Status	Open	**Opening date**	20/09/2016	**Deadline 1** **Deadline 2**	19/01/2017	
Type of action	IA Innovation action					
FTP subsector	Woodworking					
FTP SRA	4.1 Building with wood			**FTP relevance**	high	
	4.2 Indoor environment and functional furniture				medium	
					low	

Specific Challenge:
Buildings and more specifically the housing sector represent about 40% of EU energy consumption. Ambitious renovation of the ageing building stock offers huge potential to reduce that energy consumption. Lowering the energy costs for households while increasing in-house comfort will not only help to achieve EU environmental objectives, but will also benefit EU economy and contribute to social well-being.

A large-scale deep rehabilitation of the residential building stock to match the net-zero energy standards at affordable price must be achieved. Breakthrough solutions are required to reduce energy consumption in building (e.g. in space heating/cooling and domestic hot water production, maximising the envelope performances, heat recovery and local use of renewables) with the support of advanced BEM (Building Energy Management) systems. Proposals should go beyond the state of the art and previous project results of the EeB PPP.

Scope:
Research should address in-depth analysis and subsequent improvement of the renovation process, including innovative technical elements/products/processes aiming to improve the decision-making, and should be based on a collaborative multi-value multi-stakeholder exercise. Methodology, guidelines and effective operational tools are needed to ease the selection between renovation scenarios. The analysis should take into account life cycle assessment, life cycle costing, indoor environment quality, as well as user behaviour and acceptance. Research should lead to innovative concepts for a systemic approach to retrofitting which integrates the most promising cost-effective technologies and materials, in order to reduce heat losses through the building envelope and also the energy consumption by ventilation and other energy distribution systems, while increasing the share of renewable energy in buildings.
The new tools will help revalorisation of existing buildings in the long term, including the energy performance of the building as a factor of the total property value. This should be reflected in the definition of innovative business models where all relevant actors are involved, including public authorities and investors.

Proposals should aim at maximizing the capacity of replication of the developed concepts and methods for integrated sustainable renovation. Large-scale market uptake should be addressed, for example by targeting buildings with similar use conditions and/or comparable blocks of buildings or districts in need for renovation.

Proposals should show clear evidence of technical and financial viability of the solution through their application on real case demonstrations.

Activities are expected to focus on Technology Readiness Levels 5 to 7 and to be centred around TRL 6. This topic addresses cross-KET activities.

A significant participation of SMEs with R&D capacities is encouraged.

The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Reduction of at least 60% in energy consumption in order to reach the target of near zero energy compared to the values before renovation, while enhancing indoor environmental quality.
- Decrease of installation time by at least 30% compared to typical renovation process for the building type.
- Demonstration of a high replicability potential and of large market uptake capacity.
- Affordability considering all costs involved, with a payback period below 15 years.
- New generation of skilled workers and SME contractors in the construction sector capable of applying a systemic approach to renovation.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:

- Cross-cutting Key-Enabling Technologies (KETs)
- Contractual public-private partnership
- EeB

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Topic ID and title	EEB-07-2017 – Integration of energy harvesting at building and district level					
Status	Open	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	IA Innovation action					
Industry priority	Future cities: advanced construction materials and building systems					
FTP subsector	Woodworking					
FTP SRA	4.1 Building with wood			FTP relevance	high	
					medium	
					low	

Specific Challenge:
Integration of energy harvesting approaches is a major challenge, in particular the development and integration of different renewable energy sources at building and district scale.

The envelope should be considered as an active and/or adaptive skin that interacts with the external environment and strongly influences the building energy performance and indoor comfort. Indeed, in view of a large-scale deployment of nearly-zero energy solutions in existing buildings, besides reducing energy demand through highly insulating materials and reduction measures, the possibility to harvest energy in the building envelope is of great importance.

The district dimension should be taken into account, both because of a higher potential for integration and optimisation of renewable energy sources, and because of the potential of additional energy harvesting approaches.

Scope:
Proposals should aim at maximising the harvesting of renewable energy (for heating, cooling, electricity, domestic hot water, etc.) at building and district scale (e.g. exploiting large renewable energy source installations and heating and cooling networks). Research results should contribute to drastic energy saving and CO2 emission reduction while enabling massive replication in low zero energy buildings and energy self-sufficient districts. the focus is on a cost-effective and easy installation in a wide variety of buildings and surroundings.

Buildings are connected with various entities like suppliers and distribution system operators through different networks (internet, smart meter linked to the grid, energy storage systems, electric vehicles, etc.). Therefore, proposals should take into account an appropriate integration of monitoring and control systems for the developed solutions, combining, where relevant, additional functionalities such as safety and security.

Proposals should be flexible enough to cope with different designs and architectural concepts, with components being especially shaped and integrating different material combinations (such as glass, pre-casted elements, membranes).

The modular dimension is important to allow a cost-effective and easy installation in a wide variety of buildings and processing practices.

Proposals should enable a reduction of maintenance and operation costs, in particular when many sensors and actuators are cost-effectively distributed throughout the envelope.

Applicability in different geographical areas is important.

Clear evidence of technical and economic viability should be provided by validating and demonstrating the proposed adaptable envelope in real case retrofitting projects.

Activities are expected to focus on Technology Readiness Levels 5 to 7 and to be centred around TRL 6. *A significant participation of SMEs with R&D capacities is encouraged.*

The Commission considers that proposals requesting a contribution from the EU between 4 and 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requiring other amounts.

Expected Impact:

- The cost related to new technologies should not exceed conventional standard building costs by more than 20%.
- Demonstration of the replicability potential in a real case-study.
- Solutions with a payback period of below 10 years.
- The integrated harvesting systems will cover at least 30-40 % of the overall energy demand for new buildings and 20% for renovated buildings.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:

- Contractual public-private partnership
- EeB

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Topic ID and title	EEB-08-2017 – New business models for energy-efficient buildings through adaptable refurbishment solutions				
Status	Open	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017
Type of action	CSA Coordination and support action				
FTP subsector	Woodworking				
FTP SRA	4.1 Building with wood			FTP relevance	high
					medium
					low

Specific Challenge:

The most important benefit associated with the refurbishment of an existing building comes from improving the energy performance, which gives an essential contribution to reach the EU 2020 consumption goals, taking into account that buildings represent 40% of the energy use in the EU. A key challenge for its large-scale implementation is the necessity to manage a broader involvement of stakeholders representing different interests and different responsibilities influencing the potential solutions and actions. This regards not only the choice of technologies, but also the design and renovation methods, as well as a number of socio-economic issues.

Nowadays, decentralised energy generation technologies have been demonstrated in a number of building applications in Europe and beyond but large scale uptake and business deployment of these technologies is still in its early stage. Currently, the renovation level is about 1.2% of the building stock in Europe per year and it should increase, according to the European Performance Building Directive (EPBD), to 2 - 3 % per year until 2030. Innovative business models which allow consumers and the market to invest with confidence in long term operation, maintenance, reliability and service levels need to be developed.

Scope:

Activities should focus on the benchmark and the assessment of innovative business models, evaluating different refurbishment packages enabling the selection of the most attractive and efficient ones for different building types (residential/District Heating Cooling connected) and climatic conditions, taking the maximum advantage of user behaviour and geo-clustering.

Adequate assessment tools and the methodological challenges facing analyses addressing the issue of comprehensive analytical approaches in order to inform business decisions in this respect need to be discussed. Life cycle models as input to the decision making process in the feasibility phase of the renovation project also need to be considered.

Proposals need to assess different highly resource-efficient business models for refurbishing buildings including the assessment of the possibilities provided by public procurement of innovative solutions, appropriate combinations of public and private funding, or only private funding. These concepts need to be developed taking into account the building owners, the socio-economic impacts, and the current EU crisis.

Proposals should also develop effective methods for steering and governance especially paying attention to the local scale, including the variety of actions by cities and municipalities that can define obligations or encourage voluntary actions. In particular the business models developed should support the preparation of innovation-related public building procurements by local/regional/national

authorities or at European level, taking into account the needs of the public sector with regard to high-performance buildings (new or retrofitted ones).

The business models should cover the complete cycle as from the design phase of the building: decentralised energy generation technologies, integration, installation, commissioning, operation, servicing and maintenance, etc. In this framework, activities should cover business model design and optimisation, market and customer segmentation approaches for decentralised energy generation, consumer behaviour and decision driver research for optimising business model structures, supply chain and concept delivery optimisation, new earning models and financing mechanisms. In addition, proposers should also seek solutions to increase participation of stakeholders, considering methods to engage end users living in the buildings/neighbourhood and methods to increase the interest and commitment of building owners and market partners.

Socio-economic impacts of refurbishment should be taken into account considering the possibly drastic effects of high renovation costs on house owners and tenants, and seeking possible solutions to reduce costs, as well as addressing the needed commitment by users to energy efficiency after renovation.
Clear evidence of technical, environmental and economic viability should be provided. The possibility to engage municipalities planning to integrate renewable energy sources in the built environment could be an added value.

This topic is particularly suitable for SMEs.
The Commission considers that proposals requesting a contribution from the EU between EUR 500000 and 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Cost-effectiveness of the renovation compared to current costs.
- Adaptive renovation packages with high energy efficiency and low environmental impact.
- Increased awareness of and commitment to improved energy-efficiency of the building stock.
- Increased capacity of municipalities to effect the renovation of building stocks, in particular through the use of public procurement tools.
- Better quality standards and performance guarantees while improving indoor environment and remaining cost-effective.
- More involvement of customers/users in the integrated–innovative business model solutions.

Cross-cutting Priorities:

- Open Innovation
- Contractual public-private partnership
- EeB

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Call Name:

Nanotechnologies, Advanced Materials, Biotechnology and Production

Topic ID and title	NMBP-04-2017 Architectured / Advanced material concepts for intelligent bulk material structures					
Status	Open	**Opening date**	11/05/2016	**Deadline 1** **Deadline 2**	27/10/2016 04/05/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Woodworking + Process industries					
FTP SRA	4.2 Indoor environment and functional furniture			**FTP relevance**	high	
	4.3 New biobased products				medium	
					low	

Specific Challenge:
The development of smart materials has been gathering pace over the past few years to develop novel concepts for intelligent components and structures with integrated functionalities that are able to communicate and interact with their environment, store data about their condition and react accordingly to external stimuli. Research in the areas of biomimetic bio-inspired engineering and nanomaterials can provide several examples of the development of smart materials and has seen a significant expansion. Examples include materials that can alter their physical properties, (e.g. viscosity, shape, colour and more) in response to temperature, stress, electrical or magnetic fields, convert sunlight into electricity, store energy, etc. Smart materials have also been used extensively in sensor developments in aerospace and automotive applications with the aim of producing intelligent structures and components that provide information of their in-service conditions However, there are several concepts that have not yet been implemented in industrial scale. Such technologies include self-repair or self-healing materials, materials for vibration suppression, lightweight composites that can inform the user of any internal damage without the need of time consuming and expensive Non-destructive Examination (NDE), materials or structures that can undergo shape change either passively or by activation, Functionally Graded composite Materials (FGMs), energy storing components, etc. There is a need for predictive modelling of materials functionalities for those materials for which there are currently no accurate commercial or open-source codes available.

Scope:
Proposals are sought to address specific industrial needs and facilitate the implementation of smart materials for applications in transport, consumer goods and ICT. The potential extension of these applications to other industrial sectors such as e.g. oil & gas and petrochemicals will be an asset. The technical challenges to be addressed relate to the development, processing and integration of smart materials with new functionalities, as e.g. for: advanced sensors (nanosensor technologies), damage detection, self-repair, self-actuation, self-sensing morphing, magnetic functionality (for non-magnetic materials), optical functionality, sound and vibration damping, thermal management in ICT applications. Material concepts based on bio-inspired solutions can also be considered. Modelling of the properties of relevance to manufacturing should be considered and further developed. Although the materials most suited to such development are lightweight advanced composites from different material classes, (like multiferroics, polymeric, ceramic, glass or metal matrix composites, organic fibrous materials). It is expected that such smart materials may make use of the unique properties possessed by nanoparticles and therefore the development of nanomaterial based intelligent components will be within the scope of the call. The development of such material structures has to be accompanied by high resolution analytical tools that are able to simulate and characterise the materials

on all scales and, moreover, to track and reveal their function –structure relations in situ. The functionalities of smart materials will require the identification of gaps in standards and future pre-normative activities will have to be addressed as part of the scope. For this topic proposals should also be able to demonstrate in addition to the development concept, the feasibility of such technologies in terms of cost, production and processing methodologies, reuse/recycling of materials at end of life and reliability. Industrial and/or additional experimental partners should ensure broad validation and adoption of both the software and the materials.

The implementation of this topic is intended to start at TRL 4 and target TRL 6.
The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
The implementation of novel smart material technologies is expected to pave the way for innovative environmentally friendly smart products:

- Enhancing the market opportunities for European industries;
- Improving consumer safety;
- Reducing maintenance costs;
- Improving resource efficiency;
- Contributing to a future circular economy;
- Improved understanding of materials properties based on theoretical materials models.

Enhancing the knowledge base in the EU not only at the R&D level but also at the manufacturing and production level, creating a highly skilled workforce with improved levels of job satisfaction.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Open Innovation

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Topic ID and title	NMBP-05-2017 Advanced materials and innovative design for improved functionality and aesthetics in high volume consumer goods					
Status	Open	Opening date	11/05/2016	Deadline 1 Deadline 2	27/10/2016 04/05/2017	
Type of action	IA Innovation					
FTP subsector	Processing industries + Woodworking					
FTP SRA	4.1 Building with wood			FTP relevance	high	
	4.3 New biobased products				medium	
					low	

Specific Challenge:
Creative industries have been defined as one of the most active, significant and relevant new emerging industrial sectors in the European economy (Report on Emergency Industries, PwC, 2012). The creative industries linked to manufacturing (e.g. architecture, automotive, art, crafts, supports for cultural items, decoration, fashion, furniture, lighting, interior design materials and products, jewels, luxury, media supports, publishing, sport and toys) are generators of competitive advantages that cannot be reproduced elsewhere, promoters of local development and drivers of industrial change (COM(2012)537 'Promoting cultural and creative sectors for growth and jobs in the EU').

Creative SMEs in particular can make use of design as a strategic tool to create innovative products and services addressing new consumers' standards and societal challenges while assuring competitive and sustainable development.

However, the future European exploitation of this rich sector depend on the EU ability to support high-growth creative SMEs and start-ups in exploiting highly innovative technological advances in materials for commercial, cultural and societal applications.

To promote design-driven innovation, a number of action lines have been endorsed by the Commission, including integrating design into research and development and promoting new collaborative innovation strategies ('Implementing an Action Plan for Design-Driven Innovation', SWD(2013)380).

Scope:
Proposals should address the development of innovative advanced material solutions (e.g. superhydrophobic/superoleophobic nanomaterials and nanoscale systems, self-cleaning and self-healing systems, smart textile fabrics and papers, biomimetic, shape change/memory materials, self-assembling systems, energy harvesters) for use in the creative industry sectors defined above to make urban living significantly easier, more sustainable, more comfortable, more secure and more functional. Creativity, cultural and societal values, alongside specialist knowledge, should be driving the material innovation (e.g. increased performance, lightness, safety, sustainability, improved lifetime) to add value to products through the use of new intangible material functionalities (e.g. creative design, artistic expression, trend translation, enhanced sensations, cultural values).

Proof of concept in terms of product and/or process must be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly demonstrating scalability towards industrial needs.

In order to ensure the industrial relevance and impact of the research efforts, the key properties improvement and commercial potential of the innovative technologies compared to state-of-the-art

solutions currently available on the market should be convincingly assessed in the proposal. Sustainability aspects in the whole life cycle of the final products should be taken into account. The active participation of designers, artists, societal stakeholders, material scientists, materials suppliers, researchers, manufacturers and end users of the resulting products represents an added value and this will be reflected in the second stage of the evaluation. As relevant, the proposed activities should address sex and gender specific aspects[1].

Activities are expected to focus on Technology Readiness Levels 4 to 6, and target Technology Readiness Level 7.

A significant participation of SMEs with R&D capacities is encouraged.

The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Novel, higher added-value, better performing, sustainable, versatile, appealing designs and creative solutions for consumer goods based on innovative advanced materials or structures;
- Good integrability of the proposed innovative materials in final products (e.g. using a modular approach) and quickly reconfigurable to new custom requirements;
- Promoting new collaborative innovation strategies and practices along the value chain to develop commercial, cultural and societal applications with a strong user orientation, creating new business opportunities for the European industry and contributing to the circular economy in terms of one or more of the following: increased competiveness, faster recovery of investment, access to new markets, access to new customer segments, increased business effectiveness, increased costumer engagement, increased environmental sustainability;
- Enhancing innovation capability and competitiveness of European SMEs by effectively combining and transferring new and existing knowledge with 'intangible' factors (e.g. creative design, artistic expression, trend translation, enhanced sensations, cultural values);
- Increasing awareness of designers about new materials;
- Contribute to achieving the relevant EU policy objectives in COM(2012)537, 'Promoting cultural and creative sectors for growth and jobs in the EU'.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Gender
Open Innovation

[1]*See definition of the 'gender dimension approach' in the introduction of this Work Programme part.*

Forest-based Sector
Technology Platform

Topic ID and title	NMBP-06-2017 Improved material durability in buildings and infrastructures, including offshore					
Status	Open	Opening date	11/05/2016	Deadline 1 Deadline 2	27/10/2016 04/05/2017	
Type of action	RIA Research and Innovation					
FTP subsector	Woodworking					
FTP SRA	4.1 Building with wood			FTP relevance	high	
	4.2 Indoor environment and functional furniture				medium	
					low	

Specific Challenge:
Durability is a key criterion for materials in many applications and environments. Longer performing materials can strongly reduce overall life time costs, such as lower usage costs through reduced maintenance and shorter service interruptions. Costs may also be reduced in the production phase (raw materials, energy, transport, formability), in the installation phase, and the materials may be more appropriate for end of life reuse/recycling. Typical applications requiring excellent long term durability and high reliability are buildings, marine applications and infrastructures including off shore.

In many applications, operational durability needs to be better understood, particularly for innovative products which have no demonstrated long term performance. Durability has to be evaluated both theoretically and in real installation conditions (including within challenging environments when relevant) as these may influence final product performance.

Scope:
Research proposals should address all of the following activities: theoretical understanding (and development of models if appropriate) of the factors which affect durability of materials, including corrosion and ageing phenomena; experimental methods to measure and reliably test durability, non-destructive inspection procedures and monitoring tools; development of new and more durable materials (possibly multifunctional); and “fit for purpose” validation of new materials through life testing in the planned application and environment.

The proposed solutions should go well beyond the state of the art and it should be demonstrated that materials with improved durability also fulfil all other properties necessary for the application proposed. The following factors should also be all considered: principles of sustainability (the sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook); ease of installation; realistic solutions at a reasonable price and appropriateness for the operational environment; resistance to harsh environments if applicable. When relevant, design considerations (optimal combination of new materials) should also be considered. Recycling/reuse of materials should also be addressed. Standardisation aspects should be considered when relevant. Proof of concept in terms of one (or more) component(s) containing the new materials developed should be delivered within the project, excluding commercially usable prototypes (2006/C323/01), but convincingly demonstrating scalability towards industrial needs. Information guides for applications, installation and any appropriate training on the new solutions should be provided before the end of the project.

The implementation of this topic is intended to start at TRL 4 and target TRL 6.

This topic is particularly suitable for the participation of SMEs.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- At least 30% improvement in durability on the most relevant properties for the application;
- At least equivalent level for all other properties;
- At least 30% lower cost;
- Positive LCA balance over the whole life cycle;
- Proposals will have a higher impact if they are relevant to several applications;
- Contribution to strengthening competitiveness of the European industry, including in the field of "green" and/or offshore technologies.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the

LEIT part of this Work Programme.

Cross-cutting Priorities:
Open Innovation

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Topic ID and title	NMBP-22-2017 Business models and industrial strategies supporting novel supply chains for innovative product-services				
Status	Open	Opening date	11/05/2016	Deadline 1 Deadline 2	27/10/2016 04/05/2017
Type of action	RIA Research and Innovation				
FTP subsector	Processing industries + Woodworking				
FTP SRA	3.5 New business models and service concepts			FTP relevance	high
	3.1 Resource efficiency in manufacturing				medium
	2.4 Secured wood supply, forest operations and logistics				low

Specific Challenge:

The current lack of stability in the markets does not create strong incentives for long-term investments in tangible fixed assets, and a quick response to market demand is crucial to market success. This calls for new business models to enable industry to adapt faster to market demand. At the same time, European industry needs to reap the full benefits of digitalisation, including a new generation of highly flexible production and process technologies and equipment, such as 3D-printing.

All European companies, especially SMEs, need to have access to technology infrastructure with appropriate manufacturing facilities to help them develop their innovative product-services from the early stage of feasibility assessment up to the fabrication of first series of prototype's products and purchasing is not always the best option.

It is also important to develop value systems that take into account the new extended supply chain from the early stage of the design process up to the end-of-life activities. In addition, the real production can nowadays take place anywhere in the world and leave Europe with unused or outdated production capacities. The current process does not take into account the economic, social and environmental benefits for Europe.

Scope:

Business models supporting the novel supply chains for innovative product-services would need to facilitate the flow of information on free utilisation capacity among service providers, which could be dedicated business set-ups for that kind of product-services, or just existing manufacturers with free production capacity at certain moments in time and business companies seeking short term solutions for their capacity shortages.

New equipment, internet, digital technologies and social media have the potential to support new supply chain models that are focused on business-to-business (B2B) as well as business-to-consumer (B2C) relationships, on improving the use of manufacturing capacity in Europe, e.g. by an innovative treatment of data flows on processes and products with the possible use of sectorial clouds.

Solutions should facilitate the flow of information on free manufacturing capacity among service providers (which could be dedicated businesses or existing manufacturers with spare capacity) as well as the flow and management of data in the context of the value chain.

The research activities should focus on all of the following areas:

New, adaptive business models, networks and configurations to optimise the integration of KETs in industrial contexts, in order to increase the leadership of EU industry in the global markets. The approaches to integrate KETs should lead to a new model for European industrial production and

consumption, based on more sustainable and efficient production and consumption patterns, supporting increasingly customised sustainable products.

New business solutions for extended supply chains and the integrated sustainable European framework, which would take into account the needs of design, production, utilisation and end-of-life and overcome the risk of under-utilised capacity.

Solutions that would enable businesses in the supply chain to use new flexible production and processing systems tailored to their needs; to increase connectivity and inter-operability to rapidly coordinate; and to react to market demand as a whole system.

Solutions for local cooperation and supply, which can reduce the environmental footprint. These solutions should converge into high value-added production capable of responding dynamically to competing global economies demonstrating how the EU could benefit from international cooperation. Project activities will focus on new concepts and methodologies for knowledge-based, specialised product-service, which can fulfil the requirements of fast changing markets for innovative product-services. The service could be supplemented by after-sale services and extended guarantees provided by any entity from the supply chain base on common agreement.

Social Sciences and Humanities (SSH) elements should be considered, such as economics and business administration. In particular, proposals should address the role of consumers and users as active participants in the innovation process.

Activities are expected to focus on Technology Readiness Levels 4 to 6. This topic addresses cross-KET activities.

This topic is particularly suitable for SMEs.

The Commission considers that proposals requesting a contribution from the EU between EUR 2 and 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Innovative industrial business solutions taking full advantage of the potential provided by the digitisation of the European industry;
- Decreased production costs in Europe, through a better use of the available manufacturing capacity;
- Reduced environmental or carbon footprint compared to products produced in traditional value chains, by the use of local and regional product-services capacity;
- Novel supply networks and solutions that could be applied across industries.
- Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Open Innovation

Forest-based Sector
Technology Platform

INDUSTRIAL LEADERSHIP – Cross-cutting activities

Call name

Industry 2020 in the Circular Economy

Topic ID and title	CIRC-01-2016-2017 Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects					
Status	Forthcoming	**Opening date**	08/11/2016	**Deadline 1** **Deadline 2**	07/03/2017 05/09/2017	
Type of action	IA Innovation					
FTP subsector	Whole value chain					
FTP SRA	3.1 Resource efficiency in manufacturing			**FTP relevance**	high	
	2.5 Cascade use, reuse and recycling systems				medium	
	1.1 The performance of the sector in a perspective of global change				low	

Specific Challenge:

The increasing resources' constraints that EU is facing strongly condition its competitiveness and the quality of life of individuals. Important gains in resource efficiency can be made by replacing current linear economic models with circular models of production and consumption, which result, at the same time, in a substantial reduction of GHG emissions. While relying on industrial leadership, the success of circular economy models will depend on adopting a systemic approach to eco-innovation that encompasses value and supply chains in their entirety and engages all actors involved in such chains. A systemic approach entails foresight of the diverse impacts that transformative innovative solutions can have on the economy, environment and society at large. Side-effects of innovative practices can thus be addressed, e.g. change in energy policy due to a reduction of waste available for energy recovery. Bringing end-users closer to the design and production phases, and customising the production and delivery of goods and associated services can boost new consumption patterns that add greater value and reduce over-production, waste and other negative environmental impacts. The involvement of end-users in designing circular economic models that better respond to their needs can enable the development of value-added solutions and act as a driver for Europe's re-industrialisation.

Scope:

Proposals shall address one of the following issues:

a) Design for circular value and supply chains (2016): Through large scale demonstration projects, organisations, including from process and manufacturing industries and SMEs, whether dealing with biotic and/or abiotic resources, are expected to test and showcase circular economy solutions based on re-design of value and supply chains, taking into account products, production processes, and/or systems, as well as involving final users. Such solutions should entail the environmentally sustainable recovery, recycling and/or re-use of resources and energy flows, including by cross-sectorial symbiosis, within the overall chain from resources to marketed products.

The proposals should enable entrepreneurs, industries and researchers to collectively implement the innovative solutions at an appropriate scale, which goes beyond a single production plant. They should develop new forms of organisation and governance within and across value and supply chain(s), considering where appropriate collaboration between public and private sectors. The proposals should include an outline business plan which can be developed further in the course of the project.

Where relevant, projects are expected to contribute to the implementation of the SPIRE PPP Roadmap. For the technological innovation components, TRL 5-7 are to be aimed for (as defined in the General Annexes of this Work Programme). The EU Environmental Technology Verification (ETV) pilot programme[[http://iet.jrc.ec.europa.eu/etv/]] could be used to verify the performance of innovative technologies at higher TRLs.

The Commission considers that proposals requesting a contribution from the EU of between EUR 7 million and EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b) Systemic services for the circular economy (2017): To demonstrate through large scale projects the economic and environmental feasibility of circular economic business models that underpin new services based on performance/functionality rather than ownership, and/or on mass customisation, including through supporting demand side measures. Proposals should adopt a systemic eco-innovative approach addressing all forms of innovation, combining technological, organisational, societal, cultural and behavioural innovation, and strengthening the participation of civil society. Such an approach can foster new forms of collaboration between end-users, producers and researchers. In particular proposals should consider ways of supporting co-creation by developing, experimenting and demonstrating new business models together with end-users, taking into consideration their needs, including gender dimension, thus enabling the development of value adding solutions. Business models that foster new services and consumption and production patterns will require support to end-users in the transition to the circular economy by raising awareness and knowledge sharing activities on circular economy models. The proposals should include an outline business plan which can be developed further in the course of the project.

The Commission considers that proposals requesting a contribution from the EU of between EUR 4 million and EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.
For both: Within the projects funded, additional or follow-up funding should be sought, be it private or public, so as to achieve a more effective implementation and deployment at larger scale and scope of the innovative solutions addressed. Additional funding sources could include relevant regional/national schemes under the European Structural and Investment Funds (ESIF), such as under the European Regional Development Fund (ERDF), or other relevant funds such as the Instrument for Pre-accession Assistance (IPA II). In the latter case, contacts could be established with the funds managing body during the duration of the projects. In case of relevance for the Research and Innovation Smart Specialisation Strategies, the project proposals could already indicate which interested regions/countries have been pre-identified. Please note, however, that reference to such additional or follow-up funding will not lead automatically to a higher score in the evaluation of the proposal.

Within the projects funded, possible regulatory barriers should also be addressed, as appropriate. In particular 'Innovation Deals' may be proposed. By 'Innovation Deal' a bottom-up approach to address regulatory bottlenecks to innovation is understood, that would take the form of voluntary agreements,

with the European Commission and external stakeholders, with the aim of identifying and overcoming regulatory barriers and thus facilitating the market up-take of innovative solutions.

A life cycle thinking and assessment, in line with the recommendations and reference data from the European Platform on Life Cycle Assessment [[Data should be disseminated through nodes in the Life Cycle Data Network and studies through the Resource Directory (for further information refer to http://eplca.jrc.ec.europa.eu)]] when applicable, should be applied.

Expected Impact:

a) The testing and demonstration of circular value and supply chains, within cross sectorial, collaborative systemic approaches is expected to make measurable contributions in the medium term to:

- substantially improving the efficient use of resources in Europe, leading to significant reduction of adverse environmental impacts, including on climate change, and to optimisation of production;
- substantially reducing the generation of residual waste, by applying the principles of the waste hierarchy (as set in the Waste Framework Directive [[Directive 2008/98/EC]]), compared to current best practice;
- creating new business opportunities for industry and SMEs in the EU, including in manufacturing, contributing to the exploitation of EU innovative solutions, and improving the competitiveness of European enterprises in the global market for eco-innovative solutions;
- demonstrating the economic, social, and environmental sustainability of the proposed approaches and main elements that a business plan should include in order to realise them, including the assessment of possible positive and negative side-effects and risks, such as those associated with harmful substances potentially present in recycled materials;
- providing evidence-based knowledge for enabling framework conditions (such as the regulatory or policy framework) that facilitate a broader transition to the circular economy in the EU.

b) The testing and demonstrating of circular economic business models and services, including logistics and ICT capabilities, based on performance/functionality enhancement, is expected to measurably contribute in the medium term to:

- creating markets for new products/services (e.g. leasing or 'sharing' practices) which empower end-users in their choice for more sustainable consumption patterns, and require the implementation of innovative producer responsibility or other sectorial or cross-sectorial governance schemes;
- enabling the development of new approaches for designing products/services that collectively consider end-users, brand owners, as well as entrepreneurs, and researchers, and deliver the needs of end-users;
- reducing supply chain length, thus increasing resource efficiency and reducing adverse impacts on the environment, including on climate change;
- facilitating the inclusion of resource or materials criteria in designing products/services (e.g. durability, reparability and recyclability), thus contributing to an increase in resource and energy efficiency, and reduced environmental impacts, in the whole life cycle of products;
- creating new business opportunities for industry and SMEs in the EU, contributing to the exploitation of EU innovative solutions, and improving the competitiveness of European enterprises in the global market for eco-innovative solutions;
- demonstrating the economic, social, cultural and environmental sustainability of the proposed approaches and main elements that a business plan should include in order to realise them,

including the assessment of possible positive and negative side-effects and risks, such as those associated with harmful substances potentially present in recycled materials;
- providing evidence-based knowledge regarding the enabling framework conditions (such as the regulatory or policy framework or cultural factors) that facilitate a broader transition to a circular economy in the EU.

Cross-cutting Priorities:

- Contractual public-private partnership
- SPIRE
- Gender
- Socio-economic science and humanities

Forest-based Sector
Technology Platform

Topic ID and title	CIRC-02-2016-2017 Water in the context of the circular economy					
Status	Forthcoming	Opening date	08/11/2016	Deadline 1 Deadline 2	07/03/2017 05/09/2017	
Type of action	IA Innovation					
FTP subsector	Forestry + Process industries					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
	3.3 Sustainable water stewardship				medium	
					low	

Specific Challenge:

The European water sector has a prominent position in economy and society, but it is very diverse and fragmented. It needs to revolutionise the way public and private actors work together so as to address water-related challenges and seize on opportunities strengthening a demand-driven approach. A systemic approach, incorporating both the physical structure of the system and the rules governing the operation, performance and interactions of its components, could address those issues in an integrated manner. Such an approach should go beyond the pursuit of wastewater treatment and reduction of water use to inspire technological, organisational and social innovation through the whole value chain of water (i.e. water as a resource, as a productive input and as a waste stream), moving towards a circular economy approach.

More specifically, with an increasing global demand for food, feed and fibre, the demand for nutrients is growing. Although increasing food and biomass production necessitates a higher application of nutrients, current fertilisation practices use resources inefficiently. At the same time accumulation of nutrients is causing major environmental problems. The EU legislation is already aiming at regulating nutrient emissions to the environment but more can be done to encourage a transition to an efficient nutrient recovery and recycling. Water is the most used carrier of nutrients and, at the same time, an important resource itself. Water treatment management models and technologies have the potential to create new business opportunities for an extensive nutrient recovery and contribute to the circular economy. However, an extensive implementation of integrated nutrient recovery technologies and the use of the recovered nutrients at European level is still lacking and this is proposed to be addressed in the 2016 call for proposals.

In addition, today's water services aim mainly to save water and to improve its quality. However, water becomes more and more a scarce resource as a result of urbanisation, increased competition between various uses, economic sectors and extreme weather events. To deal effectively with these pressures, there is a need for improving water systems by considering the whole water-use production chain and by identifying solutions that enhance both the economic and environmental performance of the system. These innovative solutions should be in line with the objectives of the circular economy, contributing to the challenges of a depletion of raw materials (e.g. through the recovery of resources from waste water) and climate change (reducing energy needs or producing energy) and should be demonstrated at large scale. This is proposed to be addressed in the 2017 call for proposals.

Scope:

Proposals shall address one of the following issues:

a) Demonstrating the potential of efficient nutrient recovery from water (2016): The objective of this topic is to implement large scale demonstration projects to tap the potential of nutrient recovery and to encourage the use of these nutrients throughout Europe. Projects should cover the whole value chain from recovery of nutrients to their recycling. The demonstration may involve recovery

technologies implemented in any water sector (i.e. industrial, agriculture, or municipal). Treatment schemes should be optimised to allow better recovery rates and material qualities adapted to users' needs and capacities. A life-cycle assessment approach should be used together with environmental and health risk assessment methodologies. New business models exploiting the benefits associated with nutrient recovery and recycling should also be implemented and tested. The proposals should include an outline business plan which can be developed further in the course of the project. Relevant legal, societal and market challenges affecting the recycling of recovered nutrients and their market uptake should be addressed. Involvement of social sciences and humanities disciplines is deemed necessary, for instance to address issues such as attitudes to and acceptance of recycled products. Prospective end-users need to be involved in the projects, informing them about the quality and safety requirements to be met by the products derived from nutrient recovery, thus ensuring the involvement of the demand side to increase market success. Proposals should include participation of industry partners from relevant sectors, and active participation of SMEs where relevant.

This topic supports the implementation of the EIP Water, addressing several priority areas such as water and wastewater treatment, including recovery of resources, and water reuse and recycling.

Where technological innovation is concerned, TRL 5-7 should be achieved.

The Commission considers that proposals requesting a contribution from the EU of between EUR 6 million and EUR 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b) Towards the next generation of water systems and services – large scale demonstration projects (2017): The objective of this topic is to demonstrate innovative solutions at a large scale (i.e regions, cities and/or river basins), in line with EIP Water priorities and the objectives of the Water Framework Directive. Proposals should focus on developing the water services of the future, going beyond water supply sustainability addressing the different water value chains. They should integrate, for instance, the management of water resources and the provision of water services, expanding the re-use of treated waste water and the use of desalinated water (where appropriate), ensuring carbon neutral water services, and closing the water cycle by increasing the efficiency of wastewater treatment plants, including the recovery of energy and the re-use of chemicals and nutrients.

Projects should build on experience already gained in areas where integration of various aspects of water management and other economic and social activities is already taking place at different levels, with replication potential in other areas of Europe or at wider scale, thus demonstrating a real added-value at EU level. Successful projects should engage all relevant stakeholders, especially user communities, at an early stage in the co-creation process, bringing together technology push and application pull. This is also necessary to show the potential of using systemic eco-innovative approaches in water, to overcome related barriers and bottlenecks and to create new opportunities for jobs and growth in various regions and river basins. Participation of industry partners from relevant sectors is considered essential and the active participation of SMEs is encouraged. The application of new business models and new value chains is encouraged. The proposals should include an outline business plan which can be developed further in the course of the project. Where relevant, integrated environmental impact assessments and risk assessment of potential harmful substances should be considered. Relevant socio-economic issues, in particular, regulatory/governance issues, social behaviour and acceptability should also be addressed, requiring the participation of social sciences and humanities disciplines such as political sciences, economics, governance and business studies. To enhance the systemic approach and the transformation of water services toward a more circular

economy approach, digital technologies and ICT tools should be also considered. Activities aiming at facilitating the market uptake of innovative solutions, including standardisation, should also be addressed.

Within the projects funded, additional or follow-up funding should be sought, be it private or public, so as to achieve a more effective implementation and deployment at larger scale and scope of the innovative solutions addressed. Additional funding sources could include relevant regional/national schemes under the European Structural and Investment Funds (ESIF), such as under the European Regional Development Fund (ERDF), or other relevant funds such as the Instrument for Pre-accession Assistance (IPA II). In these cases, contacts could be established with the funds' managing body during the duration of the projects. In case of relevance for the Research and Innovation Smart Specialisation Strategies, the project proposals could already indicate which interested regions/countries have been pre-identified. Please note, however, that reference to such additional or follow-up funding will not lead automatically to a higher score in the evaluation of the proposal.

Where technological innovation is concerned, TRL 5-7 should be achieved.

The Commission considers that proposals requesting a contribution from the EU of a range of EUR 10 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

For both (2016 and 2017): Within the projects funded, possible regulatory barriers should also be addressed, as appropriate. In particular 'Innovation Deals' may be proposed. By 'Innovation Deal' an innovative better regulation instrument is understood, in the form of voluntary agreements with external stakeholders to identify and overcome regulatory barriers to innovative solutions that would enable policy or legislative objectives to be better achieved.

Expected Impact:
Projects are expected to contribute to:

A

- decreasing the dependency on primary nutrient resources and increasing the supply security at European level;
- reducing the adverse effects of nutrient emissions on the environment;
- closing the water and nutrients cycles in the whole production and consumption value chain;
- improving the quality of data on nutrient flows, thus providing important information for investments into the recycling of recovered nutrients;
- creating new green jobs and industries around nutrient recovery and recycling, including exports;
- creating new business opportunities for industry and SMEs in the EU, contributing to the exploitation of EU innovative solutions, and improving the competitiveness of European enterprises in the global market for eco-innovative solutions;
- improving the policy and market conditions in Europe and globally for large scale deployment of innovative solutions;
- providing evidence-based knowledge regarding the enabling framework conditions (such as the regulatory or policy framework) that facilitate a broader transition to a circular economy in the EU.

b)

- significant reduction of the current water and energy consumption at regional and/or river basin scale by closing the cycles of material, water and energy, using alternative water sources and supporting the transition towards smart water services;
- interconnectivity between the water system and other economic and social sectors;
- increased public involvement in water management;
- increased citizen satisfaction with water services;
- replication of new business models in other areas and replication of models for synergies between appropriate funding instruments at regional, national or European level;
- closing of the infrastructure and investment gap in the water service sector;
- creation of new markets in the short and medium term;
- providing evidence-based knowledge regarding the enabling framework conditions (such as the regulatory or policy framework) that facilitate a broader transition to a circular economy in the EU;
- implementing the Sustainable Development Goals (SDGs), in particular SDG 12 'Ensure sustainable consumption and production patterns' and SDG 6 'Ensure availability and sustainable management of water and sanitation for all', as well as the conclusions of the COP21 Paris Agreement [1].

[1] The Paris Agreement was adopted at the 21st Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change, in Paris on 12 December 2015.

Forest-based Sector
Technology Platform

Topic ID and title	FOF-09-2017 – Novel design and predictive maintenance technologies for increased operating life of production systems					
Status	Ongoing	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	IA Innovation					
FTP subsector	Processing industries					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
					medium	
					low	

Specific Challenge:
The elevated complexity and costs of production assets combined with the requirements for high-quality manufactured products necessitate novel design and reliability-based maintenance approaches that are able to provide the required levels of availability, maintainability, quality, safety while considering the system as a whole and throughout the production lifecycle.

Analysis of operational parameters and in-service behaviour, self-learning features and condition prediction mechanisms could contribute to improve smart predictive maintenance systems capable to integrate information from many different sources and of various types, in order to more accurately estimate the process performances and the remaining useful life. That will lead to a more efficient management, reconfiguration and re-use of assets and resources, avoiding false alarms and unforeseen failures which lower operators' confidence in such systems.

Scope:
The aim would be to design optimal maintainability solutions into production systems to improve operating life at maximised performance and reduce costs by carrying out maintenance activities at the most optimised time before failure occurs, thus minimising the degree of intervention required and maximising the system availability.

More trustworthy predictive maintenance and cause-and-effect analysis techniques should be developed to aggregate and interpret data captured from production systems and effectively share the massive amount of information between users. Measurements of a range of parameters at the level of components, machines and production systems should be carried out to provide data for building trend reference models for prediction of equipment condition, to improve physically-based models and to synchronise maintenance with production planning and logistics options. The dependability of the techniques would be demonstrated for a range of components and machines.

While the focus will be on demonstrating the design approaches and maintenance technologies, R&D activities supporting the integration and scale-up are expected as well.

Demonstration activities should address all of the following areas:

- Methodologies and tools for improved maintainability and increased operating life of production systems.
- Methodologies and tools to schedule maintenance activities together with production activities.
- Predictive maintenance solutions, combined with integrated quality-maintenance methods and tools, as well as failure modes, effects, and criticality analysis (FMECA) techniques, that effectively share information among different data sources in a secure way. Exploitation of networks of Smart Objects Technologies is an option.

- Versatility, in order to make solutions transferable to different industrial sectors.
- The project must include two complex demonstrators in real industrial settings to represent a clear added value.
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In order to ensure the industrial relevance and impact of the demonstration effort, the active participation of industrial partners, including SMEs, represents an added value to the activities.
Activities are expected to focus on Technology Readiness Levels 5 to 7 and to be centred around TRL6.
This topic addresses cross-KET activities.

This topic is particularly suitable for SMEs, as well as for international cooperation.

The Commission considers that proposals requesting a contribution from the EU between EUR 4 and 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
The developed new technologies should lead to a significant impact in the following terms:

- 10% increased in-service efficiency through reduced failure rates, downtime due to repair, unplanned plant/production system outages and extension of component life.
- More widespread adoption of predictive maintenance as a result of the demonstration of more accurate, secure and trustworthy techniques at component, machine and system level
- Increased accident mitigation capability.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Contractual public-private partnership
FoF
International cooperation
Cross-cutting Key-Enabling Technologies (KETs)

Forest-based Sector
Technology Platform

Topic ID and title	FOF-10-2017 – New technologies and life cycle management for reconfigurable and reusable customised products					
Status	Ongoing	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	IA Innovation					
FTP subsector	Processing industries + woodworking					
FTP SRA	3.1. Resource efficiency in manufacturing			FTP relevance	high	
	3.4 Biorefinery concepts				medium	
					low	

Specific Challenge:
New customised products will be increasingly incorporating, in a seamless fashion, intelligence and smart functionalities through advanced materials and embedded components. The integration of highly differentiated materials and components is a key requisite for flexible manufacturing of individualised consumer/customised products. On the other hand, enhanced integration of sophisticated ICT-based components and of advanced materials implies a rapid product obsolescence rate, and can thus introduce further pollution risks if reuse of products and/or components is not improved. Therefore, reconfiguration and reuse of products, and related services, need to be developed.

Scope:
To face sustainability and flexibility challenges customised products need to be conceived, designed and manufactured in a modular way, and their single components have to be developed so as to be interoperable with one another during the product/service lifetime, so as to be exchangeable and updateable whenever necessary. This influences both the hard and soft requirements and calls for new production technologies that enable the fast manufacturing, assembly and configuration of complex products, as well as the products updatability and disassembly for re-use and end of life management. In particular, consumer goods manufacturers should be able easily and effectively to integrate products and components which can be independently designed, produced and used in order to make diverse final personalised products in different production systems.

All involved actors in the product life cycle, from manufacturers of basic products components to retailers and vendors up to the final customers, should be provided with the needed hard and soft tools to reassemble and/or reconfigure the product or its components.

Research activities should address all of the following areas:

- Methodologies, engineering and tools for the fast reconfiguration and re-use of personalised products and their components
- New production techniques allowing for a fast manufacturing, assembly and configuration of complex personalised products
- Innovative methods and technologies for personalised products updatability, disassembly for reuse and end of life management of the products as well as their different components
- Methodologies and tools for the development of assembly, configuration, disassembly and reconfiguration services along the whole consumer/customised products value chain and along its overall life cycle also including the aftersale stage.

The proposals are expected to include use-case demonstrations aiming at the rapid deployment of the new modularity, reconfiguration and re-use of personalised consumer/customised products and life cycle management. All relevant value-chain stakeholders are expected to participate, including relevant Social Sciences and Humanities (SSH) practitioners.

The resulting personalised products are expected to satisfy the final consumer needs at an individual level and consequently to facilitate daily life (particularly concerning elderly, disabled or other target groups with special needs) or improve workers and sportsmen safety and health.

Activities are expected to focus on Technology Readiness Levels 5 to 7 and to be centred around TRL6.

This topic addresses cross-KET activities.

This topic is particularly suitable for SMEs.

This topic is particularly suitable for collaboration at international level, especially regarding the involvement of multiple actors in complex value chains on a global scale for consumer/customised goods.

The Commission considers that proposals requesting a contribution from the EU between EUR 4 and 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
The developed new technologies should lead to a significant impact in terms of:

- Reduction of time to market of new personalised products/services by 30% through a modular product/service design and manufacturing approach
- Cost reduction of the manufacturing of personalised products by 25% by decreasing lead times in product-services development and configuration
- Reduction of environmental impact by more than 50% due to modular reusable components and final products
- Savings of overall products/services life cycle costs by 30% as a consequence of the reusability and re-adaptability of the components of the personalised products
- Wide adoption of the technologies developed leading to increasingly flexible manufacturing of customised products

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Cross-cutting Key-Enabling Technologies (KETs)
Open Innovation
Contractual public-private partnership
FoF

Topic ID and title	FOF-12-2017 – ICT Innovation for Manufacturing SMEs (I4MS)					
Status	Ongoing	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	CSA Coordination and support action					
FTP subsector	Processing industries + woodworking					
FTP SRA	3.5 New business models and service concepts			FTP relevance	high	
	3.1 Resource efficiency in manufacturing				medium	
					low	

Specific Challenge:
For Europe's competitiveness in manufacturing, it is crucial that advances in ICT are taken up in engineering and manufacturing "at large" as soon as they have the appropriate maturity level. The topic will support fast adoption, and wide spread technology transfer of advanced ICT-based solutions for manufacturing across the business process chains – from "cradle to grave".

Scope:
As Phase 3 of I4MS (www.i4ms.eu) this topic addresses the adoption of the next generation of ICT advances in the manufacturing domain. Focus is on emerging innovative technologies and processes, which need to be customised, integrated, tested and validated before being released on the market. Special emphasis is on strengthening European SMEs and mid-caps along the value chain by adopting new concepts linked to innovative business and/or service models, and bringing them into contact with actors that can provide access to finance and access to advanced training to reskill workers.

a. Innovation actions must address all of the following three aspects.

1. Establishing across Europe networks of multidisciplinary competence centres offering "marketplaces" for companies that want to experiment with digital technologies in manufacturing of discrete or continuous goods. Centres should have the capacity to offer access to technology platforms and skills for developing and testing innovative technologies and applications, including access to design and manufacturing, rapid prototyping and equipment assessment initiatives. They should also act as brokers between suppliers and users of the technology products. Competence centres are encouraged to link to existing/emerging regional (smart specialisation) or national innovation hubs. If Horizon 2020 funding is complemented by ESIF or other regional or national funds: Horizon 2020 funding shall be used for carrying out highly innovative experiments that will multiply the impact of local initiatives to a European scale, and will build partnerships between businesses in Europe.
2. Carrying out a critical mass of cross-border experiments bringing together different key actors along the full value chain to customise the technologies according to the requirements of the users. Driven by the requirements of first-time users, Application Experiments bring together the actors of the value chain and the experts necessary to enable new users to develop novel products or services and assist them in customising and applying these in their respective environments. Experiment descriptions in proposals should include an outline of the initial exploitation plan and business scenario, which will be developed further in the proposed experiment. To remain flexible on which experiments will be carried out, the action may involve financial support to third parties, in line with the conditions set out in part K of the General Annexes. The consortium will define the selection process of additional users and suppliers running the experiments for which financial support will be granted (typically in the order of EUR 20 000 – 100 000[1] per party). Maximum 50% of the EU funding can be allocated to this purpose[2].

3. Activities to achieve long-term sustainability of the competence centres and the eco-system. This includes the development of a business plan for the competence centres and the marketplace, of which an outline business case and industrial exploitation strategy should be described in the proposal, as outlined in the Introduction to the LEIT part of this Work Programme. In addition, investors should be attracted to support business development of SMEs and mid-cap actors in successful experiments. Training needs of the SMEs and mid-caps should be collected and shared with training providers in the eco-system, with the ultimate aim that sufficient training opportunities will be available for all companies. Such activities would include also dissemination.

Proposers should cover at least one of the following four areas of technologies for adoption in manufacturing. Proposers are encouraged to support the building of pan-European ecosystems of emerging platforms and are expected to collaborate on reinforcing the European I4MS ecosystem, and to establish links to related activities, e.g. in the IoT Focus Area, the Joint Undertaking ECSEL, and the SPARC or big data PPPs.

i. **CPS and IoT:** Adoption and piloting of CPS/IoT in smart production environments, with special focus on scalable, modular and re-configurable automation systems across the process chain especially for SMEs.
ii. **Robotics**[3]**:** New robot systems that are cost effective at lower lot sizes, with the benefit of long-term improvements in productivity, the ability to work safely in close physical collaboration with human operators; and that are intuitive to use and adaptive to changes in task configuration. Key for fast adoption is the availability of flexible and easy to apply material feeding solutions. Step changes to at least two of the following abilities are therefore considered necessary: configurability, interaction capability, decisional autonomy in terms of context-awareness, and dependability.
iii. **Modelling, simulation and analytics**: HPC Cloud-based modelling, simulation and analytics services with special emphasis on sustained service models; on providing real-time support; and on addressing comprehensively security and privacy issues at all levels.
iv. **Digital design for additive Manufacturing**: Supporting the broad uptake of innovative additive manufacturing equipment and processes particularly focusing on the link between design tools and production, changes in business models, process chains and stakeholder relations.

The Commission considers that proposals requesting a contribution from the EU up to EUR 8 million would allow the areas to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. At least one innovation action is supported for each area of technologies.

b. Coordination and Support actions

To advance the European I4MS innovation ecosystem the network is to be reinforced. The aim is to achieve broad coverage in technological, application, innovation, and geographic terms, and to link up with regional/national innovation initiatives, including access to finance and access to training. Its tasks and services shall include maintaining a single innovation portal for newcomers, including a catalogue of the competences available in the I4MS network; sharing of best practices and experiences from I4MS and relevant regional/national initiatives; dissemination; identifying new innovative ICT technologies that can benefit from this scheme, brokering between users and suppliers; leveraging further investment for SMEs and mid-caps to bring the results of the application experiments to real use in the company, providing support in finding training providers for reskilling the workers in the SMEs and midcaps. For these support actions, close cooperation with the European Factories of the Future

Association (EFFRA[4]), the newly established Knowledge Innovation Community (KIC) on Added Value Manufacturing and the CSA funded under the Smart Anything Everywhere initiative is required.

Expected Impact:
Proposals should address all of the following impact criteria, providing metrics to measure success when appropriate:

- Exploration of new application areas for advanced ICT in manufacturing at large: Attract a significant number of new users of advanced ICT in the manufacturing sector, in particular SMEs and the mid-caps.
- More innovative and competitive technology suppliers, in particular SMEs, both on the level of ICT and on the level of manufacturing equipment, able to supply manufacturers with new equipment, components, and tools for improved manufacturing and engineering operations.
- More competitive European service providers through provisioning of new types of services; through strengthening the presence on local markets.
- Creation of a self-sustainable ecosystem of competence centers, users and suppliers supported by services available through a marketplace, covering a large number of regions and their smart specialisation.
- A critical mass of pan European experiments that demonstrate innovative, sustainable business models covering the whole value chain leading to quantifiable increases in market shares and/or productivity of European companies and/or industrial capacities in Europe.

Cross-cutting Priorities:
Cross-cutting Key-Enabling Technologies (KETs)
Contractual public-private partnership
FoF
Open Innovation

[1]In line with Article 23 (7) of the Rules for Participation the amounts referred to in Article 137 of the Financial Regulation may be exceeded, and if this is the case proposals should explain why this is necessary to achieve the objectives of the action.
[2]It is recommended to also use established networks reaching out to SMEs like the Enterprise Europe Network and the NCP network for calls publications and awareness raising towards SME's.
[3]The area of Robotics within the I4MS scheme is complementing the areas RTD-FoF2-2016 and LEIT-ICT Robotics topics
[4]Web link www.effra.eu

Forest-based Sector
Technology Platform

Topic ID and title	PILOTS-03-2017 – Pilot Lines for Manufacturing of Nanotextured surfaces with mechanically enhanced properties					
Status	Ongoing	Opening date	11/05/2016	Deadline 1 Deadline 2	27/10/2016 04/05/2017	
Type of action	IA Innovation					
FTP subsector	Processing industries + Woodworking					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
	4.3 New biobased products				medium	
	4.1 Building with wood				low	

Specific Challenge:
Nanostructured coatings or nanotextured surfaces provide improved scratch and abrasion resistance, super hardness and mechanical resistance that rivals diamond in performance, improved wear resistance and corrosion inhibition, bio-compatibility, control of reflectivity, sensing ability, self-cleaning surfaces improving many products such as technical textiles and papers, structural elements for machinery, construction elements, transportation, etc.

Nano-enhanced functional surfaces have huge potential in different sectors, including packaging, marine, water treatment, electronics, building and construction, automotive, transport, energy and other applications including textile, leather and industrial engineering.

The involved technologies to manufacture these surfaces or coatings are currently at a lower TRL level, and call for up-scaling, demonstration and validation in large scale pilot installations in operational environments, before industrial manufacturing can take place.

Scope:
The proposed pilot lines should address the development, upscaling and demonstration in relevant industrial environments of reliable manufacturing processes to obtain nanostructured surfaces with mechanically enhanced properties.

They should use existing pilot lines as a starting point for development, incorporating new materials and methods and/or instrumentation with real time characterization for measurement, analysis and monitoring at the nanoscale to characterise relevant materials process properties;

The aim is to increase the level of robustness and repeatability of such industrial processes; to optimise and evaluate the increased performances of the production lines in terms of productivity and cost-effectiveness; and finally to assess the functionality and performance of the new materials/products.
Proposals should address the complete research-development-innovation cycle and obstacles remaining for industrial application, and involve a number of relevant materials producers and users, also considering the needs of SMEs.

Technology transfer should be prepared through technology services at affordable costs, facilitating the collaborating with EU SME and large industries, and the rapid deployment and commercialisation of the new technology.

Examples of possible developments include:

- Upgrade existing production methods, extending current production capabilities of mass production injection moulding, or additive technologies such as Roll-2-Roll- and sheet-2-sheet printing, into the sub-100 nm regime.
- Enhancing key properties of promising lab scale nano-enabled surfaces and upscale their production up to pilot level. Different technologies for nano-enabled surface production may be considered.
- Applying such surfaces in sectors (more than one is preferred) where they may have strong social and economic impact.

Non-technological aspects key for the marketing of such products (e.g. standardization, regulatory issues, user acceptance, HSE aspects, LCA) need to be considered.

Activities are expected to focus on Technology Readiness Levels 4 to 6, and target Technology Readiness Level 7. This topic addresses cross-KET activities.

The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
The action is expected to lead to a direct economic impact on the economy of the manufacturing industry as well as society, resulting from issues such as increased performance and durability of wear-intensive industrial components, reduction of infrastructure maintenance costs, and reduction of operational costs due to energy savings.

Functional nanotextured surfaces and nano structured coatings have a huge potential for many sectors, and embedded nanostructured functionalities in coatings and surfaces can alleviate problems from ice, pollutant, UV, fire, heat, marine life, wear, friction and corrosion. These factors cost global industry billions in maintenance, loss and downtime each year. For example, direct corrosion costs account for 3-4% of a country's GDP worldwide. The same for wear costs. Energy losses due to friction in mechanical contacts reaches more than 10% of the GDP of a developed country. More sustainable production as well as products can also be expected, including an environmental impact, from using eco-friendly nanocoatings instead of traditional lubricants for example.

Integration of state-of-the-art nanotechnology in the traditional production of coatings or surfaces will give a market advantage and enhance the competitiveness of European industry.

The new functionalities achieved will have important impact on many sectors, including packaging, marine, water treatment, electronics, building and construction, automotive, energy, textile, leather and industrial engineering.

Enhanced manufacturing capacities in Europe and/or enhanced market opportunities for European enterprises. These impacts should be addressed in particular in the outline of the business case and exploitation strategy to be submitted with the proposal. The expected content of this outline is further detailed in the LEIT introduction, section 6.

The impact should be presented at three levels:

1. Impact on the consortium materials producers and users, and other involved industries, demonstrated in the form of reduced costs and full consideration of environmental and safety legislation.
2. Other existing or new materials manufacturers, describing the expected impact from further integration of the nano-enabled multifunctional materials into practical large-scale applications with producers outside the consortium,
3. Global impact in form of direct or derived benefits from competitive advantage of the new materials and products.

The impact will also be improved by a contribution to training and knowledge dissemination for building an educated workforce.

Overall the action is expected to help driving the demand in Europe as well as support the penetration of new markets worldwide. This should include clear benefits to manufacturers, including SMEs, and new entrants into the market may be expected.

Cross-cutting Priorities:
Cross-cutting Key-Enabling Technologies (KETs)

Forest-based Sector
Technology Platform

Topic ID and title	SPIRE-08-2017 – Carbon dioxide utilisation to produce added value chemicals					
Status	Ongoing	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	RIA Research and innovation action					
FTP subsector	Processing industries					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
					medium	
					low	

Specific Challenge:

CO_2 represents an alternative, abundant and valuable source of carbon which could be a suitable raw material, and its utilization has the potential to contribute significantly to reducing greenhouse gas emissions and thereby unwanted climate change effects. In addition, the utilisation of CO_2 (and CO) as a feedstock by the European process industry to produce materials, chemicals and fuels could be a key solution to reduce the dependence on imports of fossil resources provide a secure of supply of carbon feedstock while contributing to the emission reductions agreed at COP21.

The chemical industry is still largely based on the use of fossil fuels and feedstock as source of carbon, but a decrease is necessary in order to reduce carbon dioxide emissions. The utilisation of CO_2 (and CO) to produce added value chemicals may represent a viable opportunity. While there are still significant scientific technological challenges to be solved in order to exploit the CO_2 (and CO) as a carbon source in a more systematic manner, there have already been concepts demonstrated at lab scale, which could provide possible solutions if properly scaled up. Therefore, it is necessary to demonstrate the feasibility of such CO_2 (and CO) utilisation technologies to produce added value products at larger scale, in an operational environment, to be able to assess the industrial potential of such technologies.

Scope:

Proposals should address innovative chemical (e.g. catalytic) processes to produce added value chemicals from CO_2 (and CO) and demonstrate the technical and economic feasibility in an industrially relevant environment through demonstration of a system prototype. Technologies targeting conversion of CO_2 (and CO) to short chain alcohols, dimethyl ether and fuels are considered outside the scope of this topic.

The topic focuses on the conversion of CO_2 (and CO) to chemicals, possibly including chemicals with other components beyond C, H and O (such as N), in an integrated approach and therefore, the proposals need to consider the following elements:

- CO_2 (and CO) should come preferably from industrial flue and process gases from the process industries e.g., cement, steel and other energy intensive industries
- CO_2 (and CO) purification and conditioning methods to bring the gas to a sufficient quality for efficient conversion into chemicals.
- The testing of a system prototype should be integrated with process modelling and life cycle assessment in order to quantify the processes in terms of resource intensity reduction as well as reduction of emissions.
- The quality of the products obtained should relate to the specifications requested by the market.
- The project should contain an analysis of the economic feasibility and impact, and the evaluation of the market potential, and benefit on the European competitiveness deriving from the introduction of the new process.
- An analysis of the environmental and social benefits.

Proposals should involve industries in a clear leadership role.

Activities are expected to focus on Technology Readiness Levels 4 to 6. This topic addresses cross-KET activities.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Demonstrate technical and economic feasibility in the relevant environment of novel processes for $CO_2$and CO conversion to added-value chemicals.
- Reduction of at least 20%, on Life-Cycle-Assessment basis, of the emissions of greenhouse gases and energy/resource intensity with respect to commercial manufacturing of the same product. The impact on greenhouse emissions will be an important element of the evaluation.
- Significant increase of the industrial competitiveness deriving from the adoption of the novel processes of conversion of CO_2 and CO to added-value chemicals.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Contractual public-private partnership
SPIRE
Cross-cutting Key-Enabling Technologies (KETs)

Forest-based Sector
Technology Platform

Topic ID and title	SPIRE-09-2017 – Pilots lines based on more flexible and down-scaled high performance processing					
Status	Ongoing	Opening date	20/09/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	IA Innovation					
FTP subsector	Processing industries					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
					medium	
					low	

Specific Challenge:
Although the European process industry holds a globally strong position, it is losing competitiveness in the face of world regions which are richer in raw materials and/or have lower energy, labour and environmental costs. Consequently, in order to maintain its competitiveness on the global stage, it will be important to substantially improve its performance, as well as the energy and resource efficiency of its operations. In addition, the existing industrial processes often do not provide sufficient flexibility (e.g. ability to easily change production rates) making them unable to meet the demand for fluctuating production volumes and seasonal production campaigns requiring in situ processing (e.g. bio-mass, limited batches), which would benefit from flexible and/or mobile production systems that do not require extensive infrastructure (e.g. containerised approach).

During the last decade, several concepts have been developed and reported to enable more flexible, compact and cost effective processes proposing a variety of process intensification methodologies, which have the potential to achieve the very significant improvements in performances, energy usage and material efficiency sought by the industry. However, these concepts have mostly been demonstrated/validated at laboratory/small scale and further work is needed to fully assess their industrial potential in terms of performances, techno-economic feasibility and scalability, in order to contribute to a circular economy in the European market.

Scope:
Proposals are expected to identify and demonstrate innovative, compact, high performance production lines for existing and novel products with significantly lower operational and investment costs (compared to their existing analogues). This may be achieved by adaptation, redesign of existing process units or by completely new concepts, possibly using process optimised materials, provided that a significant improvement in cost, flexibility and performance can be achieved, compared to the commercially available processes. The approach proposed should allow short time-to-market and integration in currently existing plants, while ensuring a high flexibility (e.g. production lines with a broad turn-down ratio or by using parallel modular units for adapting capacity).

Proposals should address all of the following activities:

- The proposed solutions should encompass the elimination, combination or replacement of one or more process steps/units aiming to achieve significant efficiency improvement and higher productivity and flexibility, while ensuring lower capital and operation costs.
- Significant demonstration activities in a relevant industrial environment are expected, which will allow validating the productivity and flexibility improvements and provide clear indications on the scalability, replicability and potential for its integration in existing industrial plants.
- Techno-economic analysis (including LCA) providing a basis for economic and industrial feasibility for the innovative, high performance, flexile/scalable production lines that will be demonstrated, as well as a business plan for the deployment of the technology.

Demonstration of the integration in existing industrial scenarios would be a major added-value.
The proposal should include clear steps for the deployment of the concepts in industry (e.g. including clear business cases and a work package on business plans).

The proposal should provide evidence on the concept potential for job creation.

For this topic, proposals should include an outline of the initial exploitation and business scenarios, which will be developed further in the proposed project.

Activities are expected to focus on Technology Readiness Levels 5 to 7 and to be centred around TRL 6.
This topic addresses cross-KET activities.

A significant participation of SMEs with R&D capacities is encouraged.

The Commission considers that proposals requesting a contribution from the EU between EUR 6 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- The equipment size/production-capacity ratio, energy and resource consumption, or waste production will be significantly improved by more than 30% compared to existing approaches. 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 by-products and/or waste generation, as well as reducing CO2 emissions and energy consumption compared to the state of the art and in the scale relevant for the different applications
- The novel processes/production lines should contribute to lowering the investment and/or operating costs by at least 20% compared to existing approaches. The targets should be quantified in the proposal and validated during the execution of the demonstration.
- Wide adoption of the technologies developed for increasingly compact and flexible production lines.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Cross-cutting Priorities:
Contractual public-private partnership
SPIRE
Cross-cutting Key-Enabling Technologies (KETs)

Forest-based Sector
Technology Platform

INDUSTRIAL LEADERSHIP – Innovation in small and medium-sized enterprises

Call name

Horizon 2020 dedicated SME Instrument 2016-2017

The following deadlines apply to all the Horizon 2020 dedicated SME Instrument 2016-2017 calls

Types of action: SME-1 SME instrument phase 1
Deadline: Multiple cut-off
Opening date: 26 November 2015

Cut-off dates:
24 February 2016 17:00:00
03 May 2016 17:00:00
07 September 2016 17:00:00
09 November 2016 17:00:00
15 February 2017 17:00:00
03 May 2017 17:00:00
06 September 2017 17:00:00
08 November 2017 17:00:00

Types of action: SME-2 SME instrument phase 2
Deadline: Multiple cut-off
Opening date: 26 November 2015

Cut-off dates:
03 February 2016 17:00:00
14 April 2016 17:00:00
15 June 2016 17:00:00
13 October 2016 17:00:00
18 January 2017 17:00:00
06 April 2017 17:00:00
01 June 2017 17:00:00
18 October 2017 17:00:00

Topic ID and title	SMEInst-02-2016-2017 – Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs					
Status	Ongoing	**Opening date**		**Deadline 1** **Deadline 2**		
Type of action	SME Inst					
FTP subsector	Processing industries + Woodworking					
FTP SRA	4.3 New biobased products			**FTP relevance**	high	
	3.4 Biorefinery concepts				medium	
					low	

Specific Challenge:

Research results should be taken up by industry, harvesting the hitherto untapped potential of nanotechnologies, advanced materials and advanced manufacturing and processing technologies. The goal is to create added value by creatively combining existing research results with other necessary elements, to transfer results across sectors where applicable, to accelerate innovation and eventually create profit or other benefits. The research should bring the technology and production to industrial readiness and maturity for commercialisation after the project.

Topic ID and title	SMEInst-03-2016-2017 – Dedicated support to biotechnology SMEs closing the gap from lab to market					
Status	Ongoing	Opening date		Deadline 1 Deadline 2		
Type of action	SME Inst					
FTP subsector	Processing industries					
FTP SRA	4.3 New biobased products			FTP relevance	high	
					medium	
					low	

Specific Challenge:

The large numbers of SMEs characterising the EU industrial biotechnology sector are playing a crucial role in the move to competitive and sustainable biotechnology-based processes. These SMEs are characterised by their research intensity and long lead times between early technological development and market introduction. They therefore need to be supported to overcome the so-called “valley of death”. SMEs working in the field of industrial biotechnology and ideas/concepts involving the use of systems and/or synthetic biology are particularly invited to apply for funding.

Topic ID and title	SMEInst-04-2016-2017 – Engaging SMEs in space research and development					
Status	Ongoing	**Opening date**		**Deadline 1** **Deadline 2**		
Type of action	SME Inst					
FTP subsector	Whole value chain					
FTP SRA	2.2 Forest ecology and ecosystem services			**FTP relevance**	high	
	1.3 The performance of the sector in a perspective of global change				medium	
	2.3 Enhanced biomass production				low	

Specific Challenge:

To engage small and medium enterprises in space research and development, especially those not traditionally involved in it and reduce as much as possible the entry barriers to SMEs for Horizon 2020 funding. The actions under this topic could cover any aspect of the Specific Programme for Space (Horizon 2020 Framework programme and Specific programme). However, it is considered that actions in the areas of applications, especially in connection to the flagship programmes Galileo and Copernicus, spinning-in (i.e. application of terrestrial solutions to challenges in space) and the development of certain critical technologies could be adequately suited for this call.

Forest-based Sector
Technology Platform

Topic ID and title	SMEInst-07-2016-2017 – Stimulating the innovation potential of SMEs for sustainable and competitive agriculture, forestry, agri-food and biobased sector					
Status	Ongoing	Opening date		Deadline 1 Deadline 2		
Type of action	SME Inst					
FTP subsector	Forestry + Whole value chain					
FTP SRA	2.1 Multi-purpose management of forests			FTP relevance	high	
	2.5 Cascade use, reuse and recycling systems				medium	
	2.4 Secured wood supply, forest operations and logistics				low	

Specific Challenge:

SMEs can play a crucial role in developing resource-efficient and cost-effective solutions to secure sufficient supplies of safe, healthy and high quality food and other bio-based products, by developing productive, sustainable and resource-efficient primary production systems, fostering related ecosystem services and the recovery of biological diversity, alongside competitive and low-carbon supply, processing and marketing chains. Actions under this topic are expected to contribute to one or a combination of several challenges addressed by Societal Challenge 2 of Horizon 2020 with regard to terrestrial resources (i.e. 2.1 ' Sustainable agriculture and forestry', 2.2 ' Sustainable and competitive agri-food sector for a safe and healthy diet' and 2.4 ' Sustainable and competitive bio-based industries and supporting the development of a European bioeconomy'). Particular attention should be given to:

- Advancing innovations in Integrated Pest Management
- Resource-efficient eco-innovative food production and processing
- Reduction of food losses and waste on farm and along the value-chain
- Creating added value from waste and by-products generated on farm and along the value-chain

Forest-based Sector
Technology Platform

Topic ID and title	SMEInst-09-2016-2017 – Stimulating the innovation potential of SMEs for a low carbon and efficient energy system					
Status	Ongoing	**Opening date**		**Deadline 1** **Deadline 2**		
Type of action	SME Inst					
FTP subsector	Process industries					
FTP SRA	3.1 Resource efficiency in manufacturing			**FTP relevance**	high	
	3.2 Renewable energy solutions				medium	
					low	

Specific Challenge:

SMEs play a crucial role in developing resource-efficient, cost-effective and affordable technology solutions to decarbonise and make more efficient the energy system in a sustainable way. They are expected to strongly contribute to one or a combination of more than one of the challenges outlined in the legal base of the Horizon 2020 Societal Challenge 'Secure, Clean and Efficient Energy'[1], in particular with regard to:

- Reducing energy consumption and carbon footprint by smart and sustainable use (including energy-efficient products and services as well as 'Smart Cities and Communities'),
- Low-cost, low-carbon electricity supply (including renewable energy as well as carbon capture and storage and re-use),
- Alternative fuels and mobile energy sources,
- A single, smart European electricity grid,
- New knowledge and technologies, and
- Robust decision making and public engagement.

Topic ID and title	SMEInst-11-2016-2017 – Boosting the potential of small businesses in the areas of climate action, environment, resource efficiency and raw materials					
Status	Ongoing	**Opening date**		**Deadline 1** **Deadline 2**		
Type of action	SME Inst					
FTP subsector	Forestry + whole value chain					
FTP SRA	1.1 The performance of the sector in a perspective of global change			**FTP relevance**	high	
	2.4 Secured wood supply, forest operations and logistics				medium	
	3.1 Resource efficiency in manufacturing				low	

Specific Challenge:

Innovative SMEs have been recognised as being able to become the engine of the green economy and to facilitate the transition to a resource efficient, climate-smart circular economy. They can play an important role in helping the EU to exit from the economic crises and in job creation. The potential of commercialising innovative solutions from SMEs is however hindered by several barriers including the absence of the proof of concept, the difficulty to access risk finance, the lack of prototyping, insufficient scale-up studies, etc. Growth therefore needs to be stimulated by increasing the levels of innovation in SMEs, covering their different innovation needs over the whole innovation cycle.

Innovative SMEs should be supported and guided to reach and accelerate their full green growth potential. This topic is targeted at all types of eco-innovative[1] SMEs in all areas addressing the climate action, environment, resource efficiency and raw materials challenge – including but not restricted to the 2016-2017 strategic priorities of systemic eco-innovation and circular economy, nature-based solutions, climate services, sustainable supply of raw materials, harnessing GEOSS Earth observation data, cultural heritage for sustainable growth, and water – focusing on SMEs showing a strong ambition to develop, grow and internationalise. All kinds of promising ideas, products, processes, services and business models, notably across sectors and disciplines, for commercialisation both in a business-to-business (B2B) and a business-to-customer (B2C) context, are welcome.

Forest-based Sector
Technology Platform

H2020 Pillar: Societal Challenge

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

Call name

Bio-based innovation for sustainable goods and services: supporting the development of a European bioeconomy

Topic ID and Title	BB-02-2017 – Towards a method for the collection of statistical data on bio-based industries and bio-based products					
Status	Open	**Opening date**	4/10/2016	**Deadline 1** **Deadline 2**	14/02/2017 13/09/2017	
Type of action	RIA Research and Innovation action					
FBS subsector	Whole value-chain					
FTP SRA	1.1 The performance of the sector in a perspective of global change			**FTP relevance**	high	
					medium	
					low	

Specific Challenge:

As compared to bioeconomy sectors such as food-chain or bioenergy which keep hold of consolidated official statistics, there is a current lack of reliable and uniform ones on bio-based industries and bio-based products. In spite of progress made by the European Bioeconomy Observatory and other initiatives to gather data on the use of biomass for bio-based products, the following hurdles are still laying ahead to reach a widespread data availability: (i) There is lack of a comprehensive database with statistics for industrial uses of biomass from primary and secondary sources, (ii) The flow from raw materials to end products cannot be inferred from existing databases, (iii) There is insufficient comparability between different databases, (iv) Methodologies for data collection are not always transparent and existing data rely to a large extent on industry surveys and estimations of experts. This data gap hinders the development of economic models enabling the quantification of the bioeconomy and its economic, environmental and social effects. In turn, it has a negative effect on the ability of policy-makers to set the most appropriate policies to encourage investment in the bioeconomy in view of factors such as competition/synergies and possible trade-offs between various biomass uses.

Scope:

Proposals shall develop and implement a method for the collection of data on bio-based products, taking into consideration the incorporation of the data in the European statistical infrastructure (Eurostat), building on and contributing to on-going activities on exemplary bio-based products (Bio-based Succinic Acid & 1,4-Butandiol, lubricants). The following aspects will represent the framework for developing the proposals: (1) links with current CEN standardisation work on bio-based products; (2) training support or technical inputs to official customs and competent laboratory staff in Member

States and to relevant activities within the existing programmes such as Customs 2020 and European Union Customs Competency Framework (EU Customs CFW); (3) definition of the minimum bio-based carbon and/or bio-based content for some bio-based product groups (except bio-based lubricants); (4) data compatibility with European and international databases (e.g. FAOSTAT, PSD, etc.). Data generated should be fed into economic models, existing or newly developed, enabling the description of the development of the bioeconomy, its interaction with the rest of the economy, and its economic, environmental and social impact. Consortia should include a balanced combination of expertise on bio-based products, statistical reporting from Member States and modelling. Proposals should build upon the existing work of completed and on-going projects, including the current activities of the Bioeconomy Observatory, RRM-Group as well as the Commission study on Biomass Supply and Demand.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:
As a step forward in setting the most appropriate policies to encourage investment in the bioeconomy and defining possible trade-offs between various biomass uses, proposals will have to achieve:

- An implementation of an EU framework for the collection of data pertinent to bio-based products including disaggregated product-level statistics enabling the systematic monitoring of the evolution of bio-based product markets.
- The development of statistics and modelling tools providing decision-makers with the capacity to monitor bioeconomy developments and formulate clear targets and consider future impacts of present-day decisions, in particular in relation to establishing an efficient strategy for biomass use in the EU. Contribution to interoperability activities (e.g. bioeconomy related models, database interface specifications).

Demonstrate direct benefits to the bio-based industries in the form of an enhanced capacity to provide evidence of these industries' economic, environmental and social impact in quantitative terms.

Forest-based Sector
Technology Platform

Topic ID and title	BB-03-2017 – Adaptive tree breeding strategies and tools for forest production systems resilient to climate change and natural disturbances					
Status	Open	Opening date	4/10/2016	Deadline 1 Deadline 2	14/02/2017 13/09/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Forestry					
FTP SRA	2.3 Enhanced biomass production			FTP relevance	high	
	1.1 The performance of the sector in a perspective of global change				medium	
					low	

Specific Challenge:
Climate change and associated natural disturbances will increasingly influence the current distribution and productivity of tree species, within the constraints of physical barriers, long production cycles and regulations on forest reproductive materials. They will also affect the areas in which trees of different species and provenance could grow, or grow better, in the future. Assisted migration of tree species from one region (or continent) to another has contributed to increased wood production in Europe in recent centuries. Though there are examples of good practice and benefits of genetic variation, there is still limited evidence of the inherent genotypic/phenotypic plasticity of tree species and provenances, and their symbionts, to adapt rapidly enough and survive the current pace of environmental change. To counteract climate-induced decline and maintain/enhance forest productivity and meet the growing needs of society and the bioeconomy, we may enhance the resilience of forests through the selection/development of new genotypes, through traditional methods of genome sequencing and selection of desired traits and/or novel methods of genome improvement.

Scope:
Proposals should aim to develop novel tree breeding strategies and tools aimed at sustained yields (wood and non-wood products), while addressing resilience to climate change and natural disturbances (including pests and disease outbreaks), and considering biodiversity-related aspects. Proposals will aim to identify/develop genotypes with appropriate adaptation profiles for possible extension/change of tree species range, both vertically and horizontally, including those genotypes with potential for use on marginal land. Coniferous and broadleaved species that are of specific importance for forestry and ecosystem services EU-wide should be targeted. Compliance with biosafety and other relevant legislation (e.g. biodiversity and invasive alien species) should be taken into account. Complementarity with previous (FP7/LIFE) projects and COST actions should also be considered.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:
To counteract climate change, maintain and enhance forest productivity and the sustainability of forestry systems, proposals should show how some, or all, of the following impacts will be achieved:

- direct technical support for forest managers on the choice of tree species and provenances to increase stress tolerance to underlying environmental change and meet increasing societal demands on forest goods and services;
- better understanding of benefits and risks related to the economic performance of wood-value chains and the environmental effects of the enhanced use of novel biotechnologies.

Forest-based Sector
Technology Platform

Topic ID and title	BB-05-2017 – Bio-based products: Mobilisation and mutual learning action plan					
Status	Open	Opening date	4/10/2016	Deadline 1 Deadline 2	14/02/2017	
Type of action	CSA Coordination and support action					
FTP subsector	Whole value-chain					
FTP SRA	1.2 Citizens perception of the sector and its products			FTP relevance	high	
	1.3 Policies and good governance				medium	
					low	

Specific Challenge:

Ensuring that research and innovation in bio-based products and processes is not only excellent, but also relevant and responsive to the needs of all actors is important, not least in ensuring the uptake of results. Surveys show that consumers and citizens in general have little awareness and knowledge of bio-based products (BBP). To improve market uptake of bio-based products, shape future research in BBP science, technology and innovation and meet the views and expectations of society, there is a need for a broad, inclusive assessment of the challenges and opportunities at hand.

Multi-actor approaches are needed to identify and address both the risks and different stakeholders' interests and aspirations, in order to maximise the benefits of new bio-based business models within society. Mobilisation of all actors along the value chain is crucial to mitigate the probability of "technology mismatches" (i.e. development of technologies without a corresponding reliable and cost-efficient feedstock supply, or which face insufficient market demand).

Scope:

The Mobilisation and Mutual Learning Action Plan (MML) should ensure the engagement of all relevant groups and tackle innovation related challenges by establishing a multi-stakeholder platform, gathering a plurality of actors with different perspectives, knowledge and experiences[1], and maintaining open dialogue between the different stakeholders.

The objective of the platform should be the development and implementation of an Action Plan that would address the challenges of raising awareness of and engaging with the citizens on the bio-based products. Proposals have to be based on and develop the concept of Mobilisation & Mutual Learning Platforms (MML). The design of this platform and its activities should take into account and build on methods developed previously in European projects and initiatives (including consultation processes in the field of bio-based products).

The Commission considers that proposals requesting a contribution from the EU of up to EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

The direct and sustainable impact of proposals will be:

- to create networks of specific target groups in order to raise citizens' awareness and understanding of bio-based products;
- to create a better framework for new bio-based market opportunities, through broad stakeholder engagement leading to responsible, reliable, and societally acceptable solutions;

- to contribute to responsible policy-making, helping to shape further research on bio-based products and improving acceptability of existing bio-based products.

Cross-cutting Priorities:

Socio-economic science and humanities

[1]Involving a balanced representation of experts and professionals in the fields of public engagement and bio-based products in general, and more specifically researchers, civil society (CSOs) and non-governmental organisations (NGOs), scientists in the field of social sciences and humanities, industry and policy-makers.

Forest-based Sector
Technology Platform

Topic ID and title	BB-08-2017 Strategies for improving the bioeconomy knowledge of the general public					
Status	Open	Opening date	4/10/2016	Deadline 1 Deadline 2	14/02/2017 NO	
Type of action	CSA Coordination and support action					
FTP subsector	Whole value-chain					
FTP SRA	1.2 Citizens perception of the sector and its products			FTP relevance	high	
	1.3 Policies and good governance				medium	
					low	

Specific Challenge:
The bioeconomy is not a well-known concept among European citizens due to lack of information or information that cannot be understood by the general public. This means that there is little awareness of the importance of the bioeconomy in times of climate change, food insecurity and the tangible benefits the use of biological resources can bring to our everyday life. There is a strong need identified to engage in structured and coherent communication activities on the bioeconomy research and innovation results. The main tasks of this project are therefore to better understand existing barriers, raise awareness by informing citizens and establish an interactive, two-way dialogue between local research centres, the European Commission and European citizens.

Scope:
Proposals under this action should bring bioeconomy research and innovation closer to the EU citizens to show the potential economic, environmental and social impact of the bioeconomy. A series of communication activities around Europe at local level (for example in the form of bioeconomy roadshows and online campaigns) would contribute to address this challenge. Showcasing examples of bioeconomy products, demonstrating the relevance and possibilities of bioeconomy in everyday life and spread targeted information in local languages in big cities around Europe can be considered as means to bring the bioeconomy closer to a wider audience (for example to the younger generation).

The proposals may consider the involvement of local and regional authorities, and reaching out through opinion leaders as bioeconomy ambassadors could multiply these messages and be perceived by the public as source of local, credible and accessible information.

The Commission considers that proposals requesting a contribution from the EU of an indicative amount of EUR 2 million 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 the EU Bioeconomy Strategy, this action should initiate structured and consistent communication on the bioeconomy across a range of on- and offline platforms with a view to boosting knowledge of the general European public. The following impacts can be expected:

- Citizens will become aware of the importance and possibilities/impact that research and innovation in the bioeconomy can offer for them
- Bioeconomy will be put more prominent on the agenda at national, local and regional levels

Cross-cutting Priorities:
Socio-economic science and humanities

Forest-based Sector
Technology Platform

Call name

Rural Renaissance: Fostering innovation and business opportunities

Topic ID and title	RUR-03-2017 – Towards 2030: policies and decision support for an integrated approach to the management of lands as a resource					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017 13/09/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Forestry					
FTP SRA	1.3 Policies and good governance			FTP relevance	high	
	2.2 Forest ecology and ecosystem services				medium	
	2.3 Enhanced biomass production				low	

Specific Challenge:

The land used by agriculture and forestry is subject to an increasing range of potential uses from food or biomass production, to recreation including soil sealing. Policies influencing the management and use of land resources at regional, national and EU levels have evolved considerably in the past decades as underpinning objectives have widened to meet societal needs (food security, environment, energy, climate change, etc.). However, this process has been fragmented and incomplete. In addition, the technology and information available to decision-makers have advanced significantly in this time. To ensure sustainable management of land resources in the long term there is a need for an integrated framework that addresses all society's objectives appropriately by understanding trade-offs between uses and by incentivising actions / behaviours / investments contributing to desirable targets. Appropriate decision-support tools are needed to help implement such an integrated and systemic approach.

Scope:

Activities will take place on various geographic scales reflecting levels of policy / use relevance, from regional to EU levels. Investigations relating to both policy and decision tools will be fully participatory so as to ensure the involvement of the society at large. Investigations in policies will take account of all current and expected major societal needs as regards land resources and their use in terms of products, ecosystem services and other types of goods, services and functions. Decision-support tools and models will help prioritise multiple land uses at various geographic scales (meso level and related regional strategies + policies at regional/national/EU level), taking advantage of existing databases and tools and what is possible on the basis of modern capabilities. Activities will mainly include agriculture and forest land use/cover and will extend to interactions of the former with other main land uses/covers. This should ensure usability of the results in larger contexts. While focusing on Europe, proposals are encouraged to draw on good examples from elsewhere.

Proposals should ensure that the integrated framework and systemic approach proposed will be compatible with and/or improve existing databases and tools used at the European Commission, with the aim to ensure synergies and targeted contributions to the complex policy analysis.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

The project results are expected to:

- improve knowledge of land resource availability and use at various geographic scales;
- improve decision support tools for the management of land as a resource;
- improve climate resilience of agriculture and forestry, and
- provide the basis for a coherent and integrated policy framework for the management of land resources at regional / national / EU levels.

Cross-cutting Priorities:

International cooperation

Socio-economic science and humanities

Forest-based Sector
Technology Platform

Topic ID and title	RUR-05-2017 – Novel public policies, business models and mechanisms for the sustainable supply of and payment for forest ecosystem services					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017	
Type of action	IA Innovation 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:

Regional differences with respect to the forest management systems implemented and long production cycles characterise the forestry sector in the EU. Forests generally provide for a range of goods and services, some valued by existing markets (i.e. wood and non-wood products), others not. Of the latter, some are "public goods" (i.e. they are non-excludable (everyone benefits from them) and are not subject to consumption rivalry), such as carbon sequestration and landscape, while others are "common-pool resources" (i.e. they are non-excludable goods but subject to competition in use), such as recreation or water supply. The regulatory framework is divided into forest polices and forest-related policies (e.g. rural development, climate, biodiversity, and energy) which are not necessarily mutually reinforcing. The responsibility for forest policies ranges from EU level (monitoring, protection, land use, land use change and forestry (LULUCF) reporting, etc.) to Member State or federal state level (inventory, planning, management, etc.). If the policy or market fails – a recognised threat – the undesired outcome is suboptimal provision of ecosystem services. The sustainable provision of ecosystem services therefore requires policy coordination, and the use of novel policies, business models and mechanisms, while taking into account the production of wood and non-wood forest products. Several EU Member States, with the help of the European Commission, are currently mapping and assessing the state of forest (and other) ecosystems and their services in their respective national territories as part of the 'Mapping and Assessment of Ecosystems and their Services (MAES) exercise. There is now significant scope to capitalise on these efforts and for greater implementation of the knowledge they have generated in practice.

Scope:

Proposals should aim to develop novel public policies, business models and mechanisms to "internalise" the proven socio-economic value of forest ecosystem services ("externalities") and contribute to their sustainable supply, with proper consideration given to the multifunctional role of EU forests. Proposals should consider the holistic basket of economic, socio-cultural, recreational and environmental services, from both the supply and demand side, and the trade-offs between them. They should aim to close the gap between academic work, associated policy recommendations, and practice on the ground, and help achieve public acceptability. The role of active forest management, which incurs reduced income and/or higher investment, needs to be emphasised. Specifically, there is a need to develop mechanisms for the payment of ecosystem services at the appropriate level of forest management and administration. The pilot testing of the proposed mechanisms, which may combine public policy tools with business models, is encouraged. Proposals should include contributions from the social sciences and humanities, fall under the concept of the "multi-actor approach"[1] and seek public engagement with regard to the groups of stakeholders included in the consortia and the proposed business models/mechanisms.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission or selection of proposals requesting other amounts.

Expected Impact:

Proposals should show how some, or all, of the following impacts will be achieved:

- Enhanced coordination in policy making together with the development of novel policies and business processes, translated into increased incentives for forest owners/administrators to sustainably supply essential ecosystem services, such as carbon sequestration, biodiversity conservation, water regulation, soil and nutrient regulation, landscape and recreation, while maintaining production of wood and non-wood forest products.

Cross-cutting Priorities:

Socio-economic science and humanities

[1]See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

Forest-based Sector
Technology Platform

Topic ID and title	RUR-09-2017 – Business models for modern rural economies					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017 13/09/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Forestry; whole value-chain					
FTP SRA	2.2 Forest ecology and ecosystem services			FTP relevance	high	
	3.5 New business models and service concepts				medium	
					low	

Specific Challenge:

The modernisation of rural economies depends on the capacity of rural businesses to cooperate successfully to form efficient value chains which will deliver competitive products and services, high-quality and diverse jobs, and resilience to global economic and climate changes. The greater interest being shown in regional and local economies, resource-efficient and low carbon value chains or short supply chains provides opportunities to rethink and improve value chain organisation so as to turn specific assets into economic, environmental and social benefits, including through enhanced valorisation and optimisation of ecosystem services. There is a need to identify business models that have the most potential to empower rural communities to take advantage of these opportunities.

Scope:

Building on the outcomes of past European projects on rural economic development and rural jobs, proposals will identify innovative business models that are developing in rural areas, have significant potential to create added value, social cohesion and jobs, and are likely to be upscaled to or replicated in other areas, taking into account the diversity of conditions in different areas. Proposals should undertake socio-economic analyses to identify, describe and benchmark different business models in terms of starting conditions, obstacles faced, enabling factors, financing mechanisms, generation of added value, jobs and other potential environmental and social benefits, gender issues, attractiveness to young workers, and the distribution of the value generated, exploring the concept of shared value.

Particular attention should be paid to models that foster a more sustainable mobilisation of resources, improved cooperation between operators along the value chain and/or across traditional and developing sectors (e.g. via clusters/platforms), and lead to new products or services, and the recycling or up-cycling of materials. Proposals should consider food, bio-based value chains and other forms of rural business or service, in particular those based on digital technologies or valorisation and optimisation of ecosystem services. Proposals should produce practical and business-oriented tools, e.g. a collection of business cases, targeting new entrepreneurs who would like to set up businesses in rural areas and seek guidance and benchmarks on similar businesses to draw up their business plans.

Proposals should fall under the concept of' the multi-actor approach'[1], engaging relevant actors such as businesses/entrepreneurs, business or economic development organisations and innovation support services, involved in development of these new business models. Communication and dissemination activities should be carefully planned and targeted to reach audiences likely to take up, replicate and adapt the business models identified.

Selected projects should cooperate closely to maximise impact across Europe (e.g. production of common tools for entrepreneurs and stakeholders, joint analysis and recommendations, joint dissemination plans).

The Commission considers that proposals requesting a contribution from the EU of up to EUR 4.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

This action contributes to the modernisation and sustainable growth of rural economies. Applicants will measure the expected short-term impact of the project on the basis of:

- improved tools for entrepreneurship in rural areas, in particular with a database of business cases and supportive environment (e.g. clusters/platforms, technical/scientific services and infrastructure, advisory services, funding opportunities); and
- improved knowledge of business models emerging in rural areas, including a thorough understanding of their potential for development, performance and interest in economic, environmental and social terms and success factors or reasons for failures.

In the longer term, the results will:

- increase the potential for rural economic diversification, added value and job creation in a variety of rural areas thanks to the dissemination of promising business cases;
- make rural economies and societies more resilient to global changes; and
- improve the delivery of ecosystem services resulting from innovative forms of valorisation.

Cross-cutting Priorities:

Gender

Socio-economic science and humanities

[1]See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

Forest-based Sector
Technology Platform

Topic ID and title	RUR-10-2016-2017 – Thematic Networks compiling knowledge ready for practice					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017	
Type of action	CSA Coordination and support action					
FTP subsector	Forestry					
FTP SRA	1.2 Citiizens' perception of the sector and its products			FTP relevance	high	
	2.1 Multi-purpose management of forests				medium	
	2.2 Forest ecology and ecosystem services				low	

Specific Challenge:

Despite the continued generation of knowledge through scientific projects, research results are often insufficiently exploited and taken up in agricultural practice, and innovative ideas and methods from practice are not captured and spread. National and sectoral agricultural knowledge and innovation systems (AKISs) are insufficiently connected to fully meet this challenge. In view of fostering economically viable and sustainable agriculture and forestry, it is essential to close the research and innovation divide and to act at EU level. More cooperation is needed between researchers, advisors, farmers/foresters and other actors in the supply chain to stimulate knowledge exchange so as to optimise resource use and smooth the transition to a knowledge-driven agriculture. Thematic networks are a key element in the implementation of the EIP Agricultural Productivity and Sustainability (EIP-AGRI) with a view to fostering cross-border knowledge exchange and they may enable links being established with and between the EIP-AGRI Operational Groups supported under rural development programmes.

Scope:

The activities of thematic networks include summarising, sharing and presenting, in a language easily understandable for agricultural/forestry practitioners, existing best practices and research results that are near to be put into practice, but not sufficiently known by practitioners. To this end, the networks shall involve a wide range of actors covering both science and agricultural/forestry practice on the specific themes, e.g. scientists, farmers/farmers' groups, advisory services. Also EIP Operational Groups and interactive innovation groups operating in the context of the EIP-AGRI, enterprises or supply chain actors should be involved if relevant for the chosen theme. The specific themes of the networks, which may be chosen 'bottom-up', should contribute to a more competitive and sustainable agriculture and forestry. They must focus on the most urgent needs of specific agricultural or forestry production sectors, or on important or promising cross-sectoral issues, including where primary production needs to improve its linkages to the supply chain. 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 existing or completed projects and networks. The resulting easily accessible end-user material should be substantial in number and feed into the European Innovation Partnership (EIP) 'Agricultural Productivity and Sustainability' for broad dissemination to agricultural/forestry practitioners. 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. Proposals should fall under the concept of the 'multi-actor approach'[1].

The Commission considers that proposals requesting a contribution from the EU of up to EUR 2 million per network would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

This action should contribute to the successful deployment of the vast reservoir of existing scientific and practical knowledge on the chosen theme, and improve knowledge exchange between scientists and practitioners on agricultural and forestry practices. Impact should be measured on the basis of:

- the collection and provision, through the main existing dissemination channels most used by practitioners, of easily accessible practice-oriented knowledge on the thematic areas, so that the material (including material for training and educational purposes) remains available in the long term, beyond the project period;
- greater user acceptance of collected solutions and more intensive dissemination to end-users;
- increased flow of practical information between geographical areas in Europe concerned by the themes(also taking account of the differences between the territories); and
- support for the implementation of the European Innovation Partnership (EIP) 'Agricultural Productivity and Sustainability', through interaction with Operational Groups, and in particular through the delivery of a substantial number of “practice abstracts” in the common EIP-AGRI format[2], including audio-visual material wherever possible.

Cross-cutting Priorities:

Socio-economic science and humanities
Open Innovation

[1]See definition of the 'multi-actor approach' in the introduction to this Work Programme part.
[2]The common format for practitioners is available at:https://ec.europa.eu/eip/agriculture/en/content/eip-agri-common-format

Forest-based Sector
Technology Platform

Topic ID and title	RUR-12-2017 – Networking European farms to boost thematic knowledge exchanges and close the innovation gap				
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017
Type of action	CSA Coordination and support action				
FTP subsector	Forestry				
FTP SRA	1.2 Citizens' perception of the sector and its products			FTP relevance	high
	2.1 Multi-purpose management of forests				medium
	2.2 Forest ecology and ecosystem services				low

Specific Challenge:

Demonstration and pilot farms have a major role to play in peer-to-peer learning in the broader farming community and for the effective transfer of knowledge on practical farming approaches. They are also a perfect instrument for disseminating possible innovative approaches resulting from scientific work. In addition, demonstration on “real” farms allow actors to meet, network and exchange knowledge beyond the classical knowledge transfer activities. Existing demonstration farms or experimental farms in specific thematic areas need to be connected and networked within Europe so that they can do more with less. The financial crisis and the launch of the EIP "Agricultural Productivity and Sustainability"(EIP-AGRI)[1]raised awareness of the fact that farming infrastructure for demonstration purposes is costly and that thematic expertise should be shared within Europe. Beyond demonstration, thematic farm networks could develop increased interaction between science and practice, e.g. by for discussing research outputs, capturing research needs from practice, and providing a base to develop interactive innovation projects[2]responding to the needs or opportunities of the farming community. Connecting existing open-farm initiatives at local level with a view to better coordination is expected to generate 'EU added value'.

Scope:

Projects should set up network activities between geo-referenced demonstration farms dealing with specific themes across Europe with a view to exploiting their potential to improve delivery of practice-oriented knowledge and enhance interactive activities. Projects should cover a wide range of themes to be chosen according to where most added value for the EU is to be expected, and should contribute to a more sustainable and resilient agriculture and forestry. The themes would cover both sectoral approaches (e.g. specific crops or livestock) and cross-sectoral themes, for instance specific farming systems, management of soils / nutrients / water / biodiversity / landscape / supply chains, resource efficiency, agro-ecology, precision farming, environmental/climate farming challenges, integrated pest management, animal welfare, effective, resilient and biosecure livestock systems, resilient cropping, energy production and management, speciality crops, biomass applications etc. As a minimum, 10 themes should be covered. Projects should organise knowledge exchange activities and provide for connection with, and structured output from, exemplary demonstration farms that appeals to the average farmer and can be shared across Europe, e.g. farm visits, visual material (photos, video etc), easy-to-read texts, etc. The project activities should ensure synergy and complementarity with the EIP-AGRI, by thematically showcasing and cross-fertilising innovative practices/methods, and by delivering related audio-visual material and practice abstracts in the common EIP-AGRI format for practitioners[3]. They should also seek to use and complement outputs from relevant European, national and regional projects or clusters around the chosen themes, e.g. Focus Groups[4], Operational Groups[5] and Thematic networks[6].

The demonstration networks should develop linkages with advisors and their activities. Proposals should fall under the concept of the 'multi-actor approach'[7], involving a wide range of actors with

practical experience, such as farmers/farmers' groups, advisors, innovation support services, researchers, Operational groups, EIP national/regional networks and enterprises, or other supply-chain actors where relevant. They should look for synergies with the inventory of demonstration farms and best demonstration approaches delivered under topic RUR-11-2016 and coordinate their strategy with the SCAR- AKIS Strategic Working Group. Activities and networks would extend for periods longer than four years where appropriately substantiated and organise synergies with activities and groups within the EIP-AGRI.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

This action should initiate structured networking activities between demonstration farms in a broad range of specific themes with a view to boosting innovation across Europe. The following impacts can be expected:

- increased flow of practical information on specific themes between relevant geographical areas in Europe, exploiting possible complementarities with existing projects and networks;
- a series of activities spreading thematic innovative knowledge, on which Operational Groups under rural development and the EU wide EIP-AGRI network can build;
- support for the implementation of the EIP-AGRI, through a structured organisation of the flow of information on the specific themes between the relevant geographical areas, resulting in an increased networking and learning among open farms and farmers in Europe;
- increased farmer-to-farmer learning and visibility of on-farm demonstrations on specific themes, helping to spread promising best practices and ensuring a timely uptake of research results by the farming community, and fuelling interactive innovation projects and approaches; and
- a greater user acceptance of the shared information contributing to a more competitive, sustainable and climate-smart agriculture and forestry.

Cross-cutting Priorities:

Socio-economic science and humanities

[1]http://ec.europa.eu/eip/agriculture/
[2]For the interactive innovation model, see the introduction to this Work Programme.
[3]The common format for practitioners is available onhttps://ec.europa.eu/eip/agriculture/en/content/eip-agri-common-format
[4]See https://ec.europa.eu/eip/agriculture/en/content/focus-groups for the list of EIP Focus Groups
[5]See EIP website http://ec.europa.eu/eip/agriculture for the list of Operational groups
[6]See EIP website http://ec.europa.eu/eip/agriculture for the list of Horizon 2020 Thematic Networks
[7]See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

Topic ID and title	RUR-13-2017 – Building a future science and education system fit to deliver to practice					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017 13/09/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Whole value-chain					
FTP SRA	1.3 Policies and good governance			FTP relevance	high	
	2.1 Multi-purpose management of forests				medium	
					low	

Specific Challenge:

Transition towards more sustainable agriculture, forestry, food and bio-based value chains, equipped to face the challenges ahead, requires a renewal and strengthening of the technical and soft skills of all concerned. Along with ensuring delivery of peer-reviewed output from practice-oriented research, this will contribute to an efficient and interactive agricultural knowledge and innovation system (AKIS).
In 2010, 71% of European farm managers were operating on the basis of practical experience only. Education levels vary greatly depending on country, farm manager's age and gender, or farm structures, and this can hamper innovation. As the proportion of farmers with secondary and tertiary education rises, education will play an increasing role in farmers' capacity to co-create and implement new techniques and practices, anticipate and adapt to legislative, policy, market and environmental changes, design innovative ways of marketing their products and take part in interactive innovation systems and networks. New production processes and new types of supply chain in the wood, food and bio-based industry sectors also create a business demand for new skills. On the science side, there may be a shortage of researchers and capacities in fields of science of crucial importance for sustainable agriculture which are under-developed or unattractive in Europe.

While basic research remains necessary, a crucial challenge is also to remove bottlenecks to the delivery of practice-oriented research to end-users. Current research evaluation systems are based mainly on scientific publications and give little incentive, appreciation or reward to scientists willing to invest in practice-oriented research. Some front-runners are engaging in new ways of rating such research activities that deserve to be assessed, applied to agriculture and may be upscaled to a wider range of research providers and funding bodies.

Scope:

Proposals will involve the production of a challenge- and foresight-based inventory of skills that will be needed in agriculture, forestry and related value chains, covering primary producers, advisors, industry, businesses and scientists. Proposals will review how current science, education and training systems in a wide and varied range of EU Member States (and possibly third countries) cater for these needs, seeking to draft roadmaps for the improvement of curricula, learning methods and long-term interaction between education, science and economic players. Particular attention should be paid to soft (e.g. entrepreneurial, intermediation and communication) skills in particular for farmers, advisors and researchers, and technical skills related to new practices or processes and sustainability requirements in scientific fields of importance for the future. Needs should be differentiated in the light of the variety of farming systems, current trends in structural change, emerging business models in farming and subsequent value chains and geographical conditions. Proposals should analyse how education and training systems could improve, in particular by attracting more farmers and other players to engage in sufficient education and lifelong learning and by ensuring that these systems are fit for purpose and permanently updated. Piloting of new curricula and training methods in some of the participating institutions could be considered. The effectiveness of existing EU policy instruments on education and training in this area should also be assessed and improvements proposed. Proposals will

take into account relevant EU initiatives to ensure potential synergies (e.g. Erasmus+, Marie Skłodowska-Curie actions, Knowledge and Innovation Community Food for Future, etc.).

Furthermore, proposals should develop an operational system for encouraging and measuring performance and reviewing outputs of interactive innovation and practice-oriented research, with a view to improving their effective delivery and the uptake of best practices from the field. They should build on front-running initiatives and assess different options currently being tested in the EU or elsewhere (e.g. the EIP-AGRI common format). Activities should deliver practical methodologies and criteria for i) measuring performance of research providers and projects with regard to their outputs for practice; and ii) translating academic knowledge into practical knowledge easily understandable by end-users. To this end, proposals should develop a peer-review system for research outputs ready-made for delivery to farmers and foresters, exploring all components required to operate such a system.

Proposals should build on the analysis to make further policy recommendations on how to develop education, training and science in the future. Proposals should fall under the concept of the 'multi-actor approach'[1] and be highly participatory, involving specialised education bodies, farming/forestry sector representatives and advisors from the outset of project development to maximise bottom-up elaboration and final uptake of project results. It may be useful to involve authorities in charge of curriculum development and measuring research impact. Communication and dissemination activities should reach out far beyond the consortium to improve the uptake of research results.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 7 million allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

This action should improve the performance of science and education systems and their benefits for agricultural and forestry sectors and related industries. The following impacts are expected:

- a shared inventory of the skills needed for a transition to more competitive and sustainable agriculture and related value chains, serving as a basis for continuous and longer-term cooperation between education bodies across Europe, leading to intensified exchanges and regular updates of the inventory;
- improved technical and soft skills for farmers, foresters, advisors, industry employees and scientists, translating into better farm management, increased competitiveness, sustainability and resilience to environmental, climate and market changes;
- greater awareness of gaps in research capacities and specific fields of science of crucial importance for sustainable agriculture;
- increased efficiency of agricultural knowledge and innovation systems in the EU thanks to i) improved linkages between education, science and economic players, ii) enhanced capacity of players to interact with one another, and iii) contribution to an institutional shift towards better recognition and rewarding of practice-oriented research;
- improved quality and usefulness of research outputs for the immediate use by farmers, foresters or value-chain businesses, thanks to a peer-review system leading to an improved implementation of research results by end-users and an innovative agricultural sector; and
- recommendations for improved policies for education, agriculture, research and innovation at European, national and regional levels.

Cross-cutting Priorities:

International cooperation
Socio-economic science and humanities

[1]See definition of 'multi-actor approach' in the introduction to this Work Programme part.

Topic ID and title	RUR-16-2017 – Optimising interactive innovation project approaches and the delivery of EU policies to speed up innovation in rural areas					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017 13/09/2017	
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:

A number of recent initiatives and instruments for speeding up innovation deserve in-depth exploration. Horizon 2020 and the European Commission's Communication on the CAP towards 2020 have focused attention on innovation in agriculture and related sectors. The European Innovation Partnership (EIP) "Agricultural Productivity and Sustainability", a new approach under the Europe 2020 strategy, aims to speed up EU research and innovation by linking existing policies, instruments and actors. The agricultural EIP in particular implements the interactive innovation approach which relies on knowledge exchange and the empowerment of all actors concerned, and focuses on getting results implemented in practice. An EU wide EIP network is connecting the EIP Operational Groups funded under rural development programmes and provides interaction with Horizon 2020 projects. Apart from Horizon 2020 multi-actor research projects and thematic networks compiling practice-ready knowledge, other EU and national policies may also contribute to innovation, e.g. the Farm Advisory System, Rural Development funding supporting farm advisory services, knowledge and information actions, LEADER, specific national/regional or particular H2020 instruments etc. All of these contribute to innovation in agriculture and forestry. The challenge is to improve their targeting and interlinking - if and where needed -, and possibly learn from relevant insights from outside Europe.

Scope:

Proposals should explore how instruments and approaches under the various policies could be further adjusted and how they contribute to innovation in the agricultural and forestry sector. Learning also from experience at international level, proposals should investigate the design and implementation of interactive innovation projects[1], on the basis of a substantial number of case studies of interactive projects in a broad range of agriculture and forestry sectors.

An essential part of this topic would develop detailed best practices/approaches for H2020 multi-actor projects and thematic networks at project level. On the basis of a series of cases of existing multi-actor projects and thematic networks, proposals should develop best practices for consortia to combine as much as possible both scientific and practical knowledge in their projects and exploit them to the full. Special attention needs to be given to the role of facilitators that mediate between different types of actor and to the particular management/coordination needs of this type of project, with a view to intensifying knowledge exchange between actors. Examples of unsuccessful approaches where project implementation is not delivering as expected are also relevant: 'facts', 'feelings' and group dynamics should be taken into account. Activities should investigate how co-creation and co-ownership of project results can be improved and quantified/qualified in order to speed up the use of project results in practice. Activities will examine how practically/legally to construct consortia with different types of actor, taking into account the different status of the various types of organisations involved (partner, subcontractor, etc). Projects should also explore pathways for involvement of secondary and higher education as actors in interactive innovation projects, including H2020 multi-actor projects, thematic networks and EIP Operational Groups. Furthermore, activities should examine how multi-actor projects

and thematic networks can seek synergies and intensify effective linkages with Operational Groups and other interactive innovation projects under national/regional/European policies.

Proposals should fall under the concept of the 'multi-actor approach'[2] involving key actors in the AKIS (farmers, advisors, researchers, research bodies, social scientists, managing authorities, network agents, enterprises, etc.) and using the work of the SCAR-AKIS Strategic Working Group, as appropriate. They may include insights from outside Europe.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

- a description of supporting mechanisms and governance for a more efficient management of interactive innovation projects, including pathways for improved interaction with existing sectoral, rural and innovation actors and networks at local, regional, national and EU level and to the Farm Advisory System under the Common Agricultural Policy;
- development of best practices for building and implementing multi-actor project proposals and consortia under H2020, including thematic networks compiling knowledge for practice;
- delivery of a set of good examples of various types of multi-actor research projects and thematic networks which compile practice-ready knowledge and connect successfully with Operational Groups;
- better quantitative and qualitative measurement of scientific efforts impacting agricultural practices and systems, including the impact of the facilitating actors and the involvement of education; and
- suggestions for public policy governance mechanisms, contractual arrangements and appropriate funding instruments providing for effective interactive projects, enhancing innovation-driven research and advisory services leading to more competitive, sustainable and climate-smart agriculture.

Cross-cutting Priorities:

Socio-economic science and humanities

[1]For the interactive innovation model, see the introduction to the Work Programme.
[2]See definition of the 'multi-actor approach' in the introduction to this Work Programme part.

Forest-based Sector
Technology Platform

Call name

Sustainable Food Security: resilient and resource-efficient value chains

Topic ID and title	SFS-19-2016-2017 – ERA-NET Cofund: Public-Public Partnerships in the bioeconomy				
Status	Forthcoming	**Opening date**	04/10/2016	**Deadline 1** **Deadline 2**	14/02/2017
Type of action	ERA-NET-Cofund				
FTP subsector	Whole value-chain				
FTP SRA				**FTP relevance**	high
					medium
					low

Specific Challenge:

Agriculture and the agri-food sector are integral parts of the economy and society in Europe. They are subject to multiple external pressures, such as rising demand for food, feed, fuel and fibres, globalisation, environmental changes and public health considerations. They are also constrained by physical limits such as the availability of land and water. Demand for animal food products and competition for natural resources are expected to increase. This implies that agriculture and agri-food sector will need to become more efficient and sustainable.

Scope:

Proposals should address one or more of the following issues (A) to (C) for 2016 and (D) to (E) for 2017 and should clearly indicate to which one they refer.

A. [2016] Organic farming and food production
B. [2016] Sustainable food production and consumption
C. [2016] A knowledge platform for the intestinal microbiome
D. [2017] Sustainable crop production
E. [2017] Innovative forest-based bioeconomy

Scope:

Forests cover more than 40 % of the EU's landmass and are instrumental in a number of key policy areas. The forest-based sector provides income for 16 million owners, supports 3-4 million jobs in rural areas, represents some 8% of the EU's total manufacturing value; removes the equivalent of approximately 9 % of greenhouse gases emitted by other parts of the economy; and provides for a wide range of other social, economic and ecological services. The proposed Cofund action will promote increased innovation and competitiveness of the forest-based sector in Europe and support its transformation from a resource-intensive to a knowledge-intensive, productive, resource-efficient and resilient sector. Sustainability and modernisation of forestry systems and downstream value chains including innovative business concepts and production technologies will be needed to develop the forestry sector and the European bioeconomy, of which forestry accounts for a large share. Basic and applied research, close-to-market research and innovation actions are all envisaged. The scope spans all forest-based value chains, from forest vitality and sustainability of forestry production systems to efficiency in supplying forest-based goods (wood and non-wood) and services.

Expected Impact:

Enhanced resilience of forest ecosystems and forestry production systems to natural disturbances (including pests and diseases), connected to watershed and landscape management; sustainable

provision of forest biomass for the European bioeconomy, ecosystem services and non-wood forest products; development of new sustainable and resource-efficient value chains and consolidation of the existing ones; development of new knowledge and processes to support major transitions and innovations in the forest-based sector, supporting business development in rural areas and industrial development, in crucial sectors such as forest-based industries (traditional and emerging branches), construction, transport and energy; increased resource efficiency (e.g. water, energy) and climate change mitigation (carbon sequestration in forest and wood-based products); and contribution to the implementation of key EU policy areas such as rural development, biodiversity, climate change, industrial policy, circular economy and bioeconomy.

Expected Impact:

- Improve coordination and reduce the overlap between national and EU funding in relevant fields of research;
- achieve a critical mass and ensure better use of limited resources in fields of mutual interest;
- share good practice on implementing research programmes;
- promote transnational collaboration and new knowledge generation and innovation;
- involve small and medium-sized business in transnational projects, if appropriate, to enhance innovation.
- map on-going research activities (where appropriate);
- establish a network of research activities carried out at national and regional level, including a mutual opening of national and regional research programmes (where appropriate).

Cross-cutting Priorities:

ERA-NET

Forest-based Sector
Technology Platform

Topic ID and title	SFS-35-2017 – Innovative solutions for sustainable food packaging					
Status	Forthcoming	Opening date	04/10/2016	Deadline 1 Deadline 2	14/02/2017	
Type of action	IA Innovation action					
FTP subsector	Process industries					
FTP SRA	4.4 Intelligent packaging solutions			FTP relevance	high	
					medium	
					low	

Specific Challenge:

In recent decades, there has been much research into innovative food packaging technologies and solutions (e.g. active, intelligent, recyclable, easy-to-use, organic, antibacterial). This includes research aimed at reducing the environmental footprint of packaging material, increasing the shelf-life of food and developing food spoilage indicators, improving product design, optimising process efficiency, and reducing the need for chemical preservatives while maintaining the nutritional and sensorial properties of food. In spite of the progress made, much remains to be done to overcome the barriers to market uptake of many promising technologies.

Scope:

Proposals should clearly address the problems associated with the scaling-up and commercialisation of eco-innovative solutions to packaging in a developing framework of social, economic and environmental conditions. Activities should aim to produce plans and arrangements or designs for new, modified or improved products, processes or services. For this purpose, they may include prototyping, testing, demonstrating, pilot projects, large-scale product validation and market replication. Proposals may, if necessary, include limited research and development activities. If there are clear market failures or cultural or behavioural barriers to overcome, proposals may comprise activities such as validating the benefits for users/buyers, validating technical and economic performance at system level, validating standards, and activities to prepare market uptake, ensure consumer acceptance and optimise access to and the dissemination of results. Work is expected to benefit from contribution of social sciences and a gender approach. Participation of all relevant stakeholders in the food production and supply chains is encouraged. Demonstration activities will require the involvement of packaging and food processing companies, retailers and civil society organisations to bridge the gap between ideas that have been developed and their practical implementation.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude the submission and selection of proposals requesting other amounts.

Expected Impact:

With a view to supporting the transition from a linear to a circular economy, proposals should show how some, or all, of the following impacts will be achieved:

- wider and faster deployment of innovative, user-driven, packaging solutions resulting from greater industry and consumer acceptance, and higher visibility of innovative solutions, overcoming the barriers to market uptake.
- reduced waste in both food and packaging materials, and its negative impacts on the environment (e.g. resource utilisation, greenhouse gas emissions, pollution).
- strengthening of the EU's position in manufacturing, improving competitiveness as well as opportunities for growth, diversification and job creation for the EU food and packaging sector in general, and SMEs in particular.

- strengthening the European food value chain through continued support to product quality, contributing to consumer trust and increased consumption.
- support for the transition from a linear to a circular economy.

Cross-cutting Priorities:
Gender
Socio-economic science and humanities
Open Innovation

SOCIETAL CHALLENGE 3: Secure, Clean and Efficient Energy

Call name

Energy Efficient Call 2016-2017

Topic ID and title	EE-04-2016-2017 – New heating and cooling solutions using low grade sources of thermal energy					
Status	Open	**Opening date**	26/07/2016	**Deadline 1** **Deadline 2**	19/01/2017	
Type of action	RIA Research and Innovation Action					
FTP subsector	Processing industries + woodworking industries					
FTP SRA	3.2 Renewable energy solutions			**FTP relevance**	high	
					medium	
					low	

7 July 2016 10:21 Work Programme 2016-17 Revision (European Commission Decision C(2016)4614 of 25 July 2016)

Call 2017: The specific challenge, scope and impact of topic EE-04-2017: New heating and cooling solutions using low grade sources of thermal energy has been updated. The Type of Action has been changed to Innovation Action (IA).

Call 2017: The single budget line for topics EE-01-2017: Waste heat recovery from urban facilities and re-use to increase energy efficiency of district or individual heating and cooling systems, EE-04-2017: New heating and cooling solutions using low grade sources of thermal energy; and EE-20-2017 Bringing to market more energy efficient and integrated data centres has been divided in 2 separate budget lines. Topics EE-01-2017 and EE-04-2017 have a single budget line of 16.0 EUR million and topic EE-20-2017 has a single budget line of 6.0 EUR million.

Specific Challenge:

For 2017 only (Innovation Action on applicability of low temperature district heating to the buildings with high energy performance):

District energy systems can use low grade sources, such as residual heat (e.g. waste heat from industry processes, low-grade heat from waste water) and renewable energy available mainly at low temperatures only to supply heating to buildings with high thermal performance and equipped with low-temperature heating systems. The applicability of these highly efficient low temperature district heating systems however faces a number of challenges, such as the transition to technology maturity, the need to use newly dedicated or transform existing district heating distribution networks and building heating systems and the need to change the perception of what district heating can deliver to consumers. The transition to a highly efficient building stock can undermine the technical and economic viability of conventional district heating systems, because it reduces thermal demand while keeps the costs of supply and the network infrastructure the same. This results in higher cost of the heat delivered. The transition to highly efficient low-temperature district heating systems can address these

challenges and enlarge the range of modern efficient heating supply options for consumers with low-cost, highly efficient and high-comfort district heating for efficient buildings.

Scope:

For 2017 only (Innovation Action):

Actions are needed to demonstrate the applicability of low temperature district networks using large shares of residual and renewable energy sources of low-grade heat to supply space heating and hot water to areas of buildings with high thermal performance standards., which could also include applications in areas with lower building density areas than those typically considered for district heating. Actions could include applications in newly developed district heating networks or could show means through which existing networks could respond to the expected decrease in thermal demand and supply temperatures due to better building performance through conversion to low temperature district heating networks.

As necessary and relevant (e.g. due to climatic conditions) proposals could also integrate the provision of space cooling as part of the overall solution although the focus of this topic should remain in the provision of space heating and hot water. Concerning the provision of hot water projects should give consideration to providing solutions to eliminate the risk of legionella. Proposals may also consider the combination of district heating solutions with solutions at the individual building level as long as the concrete solution respond to the challenges of this topic.

Proposals should pay attention to presenting solutions that are able to offer competitive cost of heat in areas of buildings with high thermal performance which could also include applications in areas with lower building density areas than those typically considered for district heating. Proposals should pay attention to means of reducing heat distribution losses and to achieving reduction in the installation costs of networks whilst retaining reliability and durability of the distribution network. Modern district heating systems also need to meet the challenge of effectively and efficiently addressing large daily and seasonal variations of heat loads for space heating, while ensuring the meeting of the largely constant demand for domestic hot water, though advance control mechanisms, energy storage and the connection of multiple generation sources. Consideration should be therefore given to the optimisation of the system operation via advanced controls and storage, and the use of metering and interfaces that allow the end user to play an active role in the system both as and end user and a supplier.

Proposals should propose technical solutions and business models for successful commercial operation of the district heating applications described in this topic. Therefore, the projects should engage and involve as necessary district heating companies and technology providers.

Proposals should aim at moving technologies from TRL 5-6 to TRL 7-8. In all cases TRL-7 or TRL-8 should be achieved at the end of project activities (please see part G of the General Annexes).

The Commission considers that proposals requesting a contribution from the EU of between EUR 3 and 4 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

For 2017 only (Innovation Action):

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

- Primary energy savings and GHG emission savings triggered by the proposed solutions (compared to best available solution existing today);
- Competitiveness of the heat delivered by the proposed solutions (compared to best available solution existing today);
- Increased share of residual and renewable sources of thermal energy in the supply of heating demand;
- Reduction of heat distribution losses of the proposed solutions (compared to best available heat distribution network solutions existing today);
- Viable business model showing the economic and commercial viability of operating the proposed solutions
- Scale of the replicability potential of the proposed solutions

[1]Sources of residual and renewable energy e.g. sewage water, underground resources, solar heat, low grade waste heat, etc.
[2]In the context of this topic this refers to systems able to deliver useful heating and cooling using low grade energy sources, e.g. sources of heating or cooling at temperature levels close to room temperature for space heating and cooling applications
[3]The levels of temperature referred to as low/moderate will depend on the concrete application

Topic ID and title	EE-11-2016-2017 – Overcoming market barriers and promoting deep renovation of buildings					
Status	Forthcoming	Opening date	19/01/2017	Deadline 1 Deadline 2	07/06/2017	
Type of action	CSA Coordination and Support Action					
FTP subsector						
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high	
	4.1 Building with wood				medium	
					low	

27 July 2016 10:54: Work Programme 2016-17 Revision (European Commission Decision C(2016)4614 of 25 July 2016)

Call 2017: The single budget line for topics EE-02-2017: Improving the performance of inefficient district heating networks, EE-11-2017 Overcoming market barriers and promoting deep renovation of buildings, and EE-14-2017: Construction skills, has been divided in 2 separate budget lines. A single budget line of 8.0 EUR million has been created for topics EE-11-2017 and EE-14-2017.

Specific Challenge:

In order to achieve the EU 2020 energy efficiency objectives, the renovation rate needs to increase from the present level of 1.2% per annum to at least 2-3% (with a specific target for the public sector of 3%) and the energy performance of renovations needs to improve. Both the Energy Performance in Buildings Directive (EPBD) and the Energy Efficiency Directive (EED) contain several provisions in this respect. The environmental sustainability of renovation process but more importantly, the health and wellbeing of the occupants are also relevant. This might lead to consideration of aspects partially covered by different pieces of EU legislation such as REACH, the Water Framework Directive[1], the Construction Products Regulation[2], etc.

Many barriers, which are not necessarily technological, hamper the implementation of these provisions. For example: diversity and fragmentation within the building value chain; inefficient and complex renovation processes; a lack of deep renovation packages; low development and uptake of financial packages or incentives (e.g. grants, credits); unclear energy or environmental requirements in renovation grants or procurement processes; low progress in performance guarantees. There is therefore, a need to overcome these regulatory and non-regulatory barriers to facilitate the renovation of existing building stocks.

Scope:

The focus of submitted proposals should be aiming at overcoming market barriers to deep renovation within the value chain. Any building type may be included (public or private, residential or non-residential).

Renovations can take place at one point in time or be staged in a step-by-step approach, but in any case, they should strive to achieve "deep renovation" (at least 60% energy savings compared to pre-renovation levels) or aim towards Nearly Zero Energy Buildings (NZEB) performance. Proposals might consider integration of voluntary certification schemes along with energy performance certificate, including elements of indoor quality classification for buildings.

Proposals should address at least two of the following options (list not exhaustive):

- Support to consumers or end-users

- Support the implementation of renovation road maps resulting from the EED/EPBD
- Address the gap between designed and actual energy performance; support reliable energy performance standards, quality of certification and labelling schemes, etc.
- Increase the number of deep renovations by means of :
    - Solutions that offer affordable deep renovation to a large number of individual consumers (e.g. owners or end-users) and/or
    - Targeting large groups of building units in order to take advantage of opportunities for simplification and cost reduction and the potential for further replication.
- Support the use of existing financial mechanisms, instruments and innovative business models to address market failures, in particular split incentives.

The proposals should build on previous experience, including the outcome of Intelligent Energy Europe projects.

Synergies may be considered with activities initiated under the topic LCE-17-2017.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 and 2 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

Depending on the options chosen to address in the Scope, proposals are expected to demonstrate the impacts listed below in the participant countries (wherever possible, using quantified indicators and targets):

- Increased rate of renovation in the targeted area or sector (local, regional or national; public or private; residential; non-residential);
- Increased number of individual deep renovations (exceeding 60% energy savings compared to pre-renovation levels);
- Energy savings and renewable energy triggered through deep renovations;
- Increased compliance rate in deep renovations;
- Improved environmental sustainability of deep renovation solutions.

[1]2000/60/EC (EU Water Framework Directive) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060
[2]Construction Products Regulation (EU 305/2011) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:088:0005:0043:EN:PDF

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Topic ID and title	EE-14-2016-2017 – Construction skills					
Status	Open	Opening date	19/01/2017	Deadline 1 Deadline 2	07/06/2017	
Type of action	CSA Coordination and support action					
FTP subsector	Woodworking					
FTP SRA	3.5 New business models and service concepts			FTP relevance	high	
	1.3 Policies and good governance				medium	
					low	

27 July 2016 11:03 Work Programme 2016-17 Revision (European Commission Decision C(2016)4614 of 25 July 2016)

Call 2017: The single budget line for topics EE-02-2017: Improving the performance of inefficient district heating networks, EE-11-2017 Overcoming market barriers and promoting deep renovation of buildings, and EE-14-2017: Construction skills, has been divided in 2 separate budget lines. A single budget line of 8.0 EUR million has been created for topics EE-11-2017 and EE-14-2017.

Specific Challenge:

In order to reach the EU's energy and climate targets, a qualified building workforce is needed. Improving the skills of middle and senior level professionals and blue collar workers in the area of sustainable energy efficient construction is therefore of key importance. This should be done throughout the entire value chain of the buildings sector. Professionals and blue collar workers also need to be aware of new upcoming challenges relating to nearly-zero energy buildings (for example new materials and, products; the integration of renewable energy sources; new systems or processes such as standardisation and common voluntary certification of buildings and use of Building Information Modelling (BIM) tools, etc.).

Scope:

The focus of submitted proposals shall be on upgrading or setting up large-scale qualification and training schemes. Proposals are to address coordination and accompanying measures (e.g. voluntary certification schemes, accreditation, mutual recognition, incentives to encourage the participation of craftsmen, sustainability of the schemes, etc.). Running training actions will not be in the scope of the proposal. Proposals may also focus on setting up a mutual recognition scheme of qualifications and certifications among different Member States. Proposals should include a strategy to ensure that qualification and training schemes are sustained after the end of the project. For financial support to trainees, proposals should link to other sources of funding available at national level such as the European Social Fund, including the Youth Guarantee Scheme.

The objective is to increase the number of skilled building professionals and/or blue collar workers across the building value chain (designers, architects, engineers, building managers, technicians, installers[1], blue collar workers including apprentices, and other building professionals) with a specific focus on the engagement of SMEs. Training schemes can also consider operation and maintenance activities. Ultimately, the aim is to improve the overall quality of renovations and new constructions, to accelerate the renovation rate and to ensure proper interactions between different trades and professions. The submitted proposals need to be focused and are not necessarily required to address the whole range of professions and crafts involved in the building sector.

Proposals should take note of the BUILD UP Skills initiative, in particular the strong links with National Qualification Platforms and the implementation of the recommendations of the national qualification

Roadmaps, and taking into account the European Qualifications Framework (EQF). They could also be developed with consideration to Erasmus+ actions and in particular the Sector Skills Alliances, which are focused on vocational training. Proposals should develop and roll-out appropriate certification and accreditation schemes to continuously improve knowledge and skills of the building workforce and to increase the quality of construction.

Proposals should focus on improved multidisciplinary approaches and understanding across different trades, for example using BIM, and involving Open BIM initiatives at the national level. They should also focus on improved appreciation of the end user's needs including the quality of indoor environment (thermal and visual comfort, acoustics, air quality, etc.) and improved operation and maintenance. Proposals may include the entire design chain (e.g. manufacturers) and material life cycles and embodied energy in the required skills.

The Commission considers that proposals requesting a contribution from the EU of between EUR 0.5 and 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

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

- Creation and implementation of sustainable qualification and training schemes for building professionals and/or blue collar workers;
- Plans for sustainability after the project's life and replication across the EU,
- Increase in the number of skilled workers (building professionals and/or blue collar workers);
- Improved collaboration and understanding across different trades and professional groups;
- Demonstrated reduction in the gap between designed and actual energy performance through improved quality of construction in specific projects;
- Measurable energy savings and/or renewable energy production resulting from improved skills;
- Improved market recognition of skills in the building sector (industry standards).

[1]The scope of this topic was modified, the change applies only to the action in 2017 call.

Forest-based Sector
Technology Platform

Topic ID and title	EE-17-2016-2017 – Valorisation of waste heat in industrial systems (SPIRE PPP)					
Status	Open	Opening date	26/07/2016	Deadline 1 Deadline 2	19/01/2017	
Type of action	IA Innovation action					
FTP subsector	Process industries					
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high	
	3.4 Biorefinery concepts				medium	
					low	

27 July 2016 12:07 - H2020 2016-17 Work Programme update (European Commission Decision C(2016)4614 of 25 July 2016)

Call 2017: The single budget line for topic EE-17-2017: Valorisation of waste heat in industrial systems (SPIRE PPP) has been increased to 11.0 EUR million.

Call 2017: For the topic EE-17-2017: Valorisation of waste heat in industrial systems (SPIRE PPP), the EU contribution considered by the Commission as allowing the specific challenge to be addressed appropriately has been updated according to which part of the topic scope a proposal addresses.

Call 2017: For the topic EE-17-2017: Valorisation of waste heat in industrial systems (SPIRE PPP), the topic conditions specify exceptions to the standard evaluation thresholds.

Specific Challenge:

Energy and fuels represent between 20% and 40% of the production costs in several Resource and Energy Intensive Industries (REII). A lot of technical progresses were already done in REII to reduce the energy consumption of the main industrial products. Nevertheless, significant parts of the input-energy are still lost in the form of waste heat by gas, liquid or solid streams.

Those losses occur because either the corresponding heat losses are difficult to recover and re-use in the process itself or in another part of the production process or the required equipment are too costly (low ROI).

The challenge is to design, build, test & demonstrate new processes/components or innovative adaptation of existing solutions for waste heat recovery in large industrial systems.

Furthermore, sources of heat losses for a given industry could be a valuable resource for another one, directly or after an intermediate transformation step. By reusing waste and residual heat in a more efficient way primary energy can be saved. This topic responds to the needs of the process industry identified in the roadmap of the SPIRE cPPP (Sustainable Process Industry through Resource and Energy Efficiency contractual Public-Private Partnership).

Scope:

Actions should improve the energy efficiency of large industrial systems by designing economically viable industrial solutions based on innovative technologies for recovery of waste heat or the innovative adaptation of already existing solutions for waste heat recovery. Actions should address the recovery of waste heat from streams from industrial processes (e.g. waste streams, by-products, intermediates) or from surplus heat in plant parameters to transform it in useful energy forms, including the

production of technical gases (e.g. oxygen, hydrogen) to be used in the industrial process itself or exported as by-products. Solutions should be adaptable to various types of industrial processes and should be validated by full scale demonstration in real production conditions in industrial facilities.

Actions could either propose innovative technologies for the efficient recovery of waste heat in large industrial systems or innovative solutions of energy symbiosis between industries or plants inside industrial parks for the valorisation of waste and residual heat. Only one or the other should be addressed by the proposed actions.

For actions proposing innovative technologies for waste heat recovery in large industrial systems one or more of the following technological issues should be addressed:

- The intermittent character of the recoverable energy flows and its variations during normal operating conditions e.g. adapted storage to smooth these variations (such as low materials cost with high thermal inertia, Phase Change Materials, commodities storage, etc.);
- Achieving safe, controlled and efficient recovery of heat from media, which are very difficult to handle and control (high temperature, high volumes, highly aggressive-fouling/deposits/corrosion);
- The transfer of energy flows from a process line to the other one, and investigating the potential use of recovered energy in other processes with various heat transfer media (water/steam, oil, salts, gases….);
- The influences of the new heat recovery process on the product quality (e.g. dry cooling instead of wet cooling);
-

Actions proposing innovative solutions of energy symbiosis between industries or plants inside large industrial parks for the valorisation of waste heat should cover, if possible, all the following points:

- To analyse, characterise and assess the sources of energy losses in the spirit of reusing them in other plants or industries (e.g. amount, composition, temperature, impurity and fluctuation have to be taken into account, improving the global environmental impact, and new measurements and models could be needed to identity them) and to identify the relevant heat and energy demands;
- To determine and demonstrate flexible solutions to coordinate the sources and demands and to optimise the energy fluxes between the different plants and industries. Interactions between the industrial site and the surroundings should be taken into account as an additional opportunity for valorisation of waste/residual heat. New management systems for the energy loss fluxes have to be developed;
- To determine and demonstrate innovative storage technologies and strategies to harmonize energy use for fluctuating inputs (e.g. wind, converter gas) and variable (batch) process demands and to exploit the variations of the hourly electricity price;
- To determine and demonstrate innovative conversion technologies and strategies to improve the accordance of demands and sources of energy;
- To define the most suitable energy carriers to be implemented at the proper scale in the environment representative of industrial application.

New management systems for the waste energy fluxes have to be developed basing on the parameters and models described above.

The activities are expected to be implemented at TRL 5-7 (please see part G of the General Annexes).

<u>For 2017 only:</u>

The Commission considers that proposals requesting a contribution from the EU of between:

- EUR 4-5 million for actions proposing innovative technologies for waste heat recovery in large industrial systems
- EUR 5-6 million for actions proposing innovative solutions for energy symbiosis between industries or plants inside large industrial parks for the valorisation of waste heat (more complex and costly actions)

would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

Proposed actions are expected to demonstrate the impacts listed below, using quantified indicators and targets, wherever possible.

For actions proposing innovative technologies for waste heat recovery in large industrial systems:

- Recovery of at least 40% of the sensible heat contained in each waste heat carrier addressed by the project.
- Measureable substantial primary energy savings clearly quantified and substantiated, and subsequent reduction of CO2 emissions
- The improvement of the energy efficiency and the reduction of energy cost will lead to a demonstrated advancement in competitiveness by the end of the project. This will expand the available portfolio of energy resources and technologies, which can be integrated within sites, across sectors and along value chains.

For actions proposing innovative solutions of energy symbiosis between industries or plants inside large industrial parks for the valorisation of waste heat:

- Recovery of at least 40% of waste heat.
- Measureable substantial primary energy savings, clearly quantified and substantiated, and subsequent reduction of CO2 emissions.
- Cost-saving optimizations of energy and resources supply and demand by taking into consideration both economical and sustainability constraints.

Cross-cutting Priorities:

Contractual public-private partnership
SPIRE

Forest-based Sector
Technology Platform

Call name

Competitive low-carbon energy

Topic ID and title	LCE-07-2016-2017 – Developing the next generation technologies of renewable electricity and heating/cooling					
Status	Open	Opening date	29/07/2016	Deadline 1 Deadline 2	29/11/2016 22/08/2017	
Type of action	RIA Research and Innovation action					
FTP subsector	Processing industries					
FTP SRA	3.1 Resource efficiency in manufacturing			FTP relevance	high	
	3.4 Biorefinery concepts				medium	
					low	

Specific Challenge:

The technologies that will form the backbone of the energy system by 2030 and 2050 are still in the research and development cycle and need to be fully developed before they could fully demonstrate their potential value in our future energy system. It is crucial that these new technologies show evidence of promising developments and do not represent a risk to society.

Scope:

At least one of the following technology-specific challenges has to be addressed in 2016:

Photovoltaics: Developing next-generation increased efficiency high-performance crystalline silicon c-Si PV cells and modules: c-Si technology holds a dominant share of the PV market and is expected to continue playing a central role for PV industry for some time in the future. The challenge is the development of advanced high-performance c-Si cells and modules based on novel architectures and/or processes which tackle efficiency limitations while improving cost-effectiveness[1]. It is necessary to demonstrate device designs and fabrication processes of technologies with efficiencies higher than 25% at cell level and above 21 % at the module level and at the same time pilot manufacturing readiness at a competitive cost.

Concentrated Solar Power (CSP): Innovative components and configurations for CSP plants: In spite of cost reductions in recent years, cost competitiveness remains a crucial barrier to the deployment of CSP plants. Several concepts with a potential for cost reduction are being explored. It is necessary to validate in relevant environment the feasibility of these concepts. Significant improvements with regard to one or more of the elements of a CSP plant (heat transfer fluids which can be used for direct thermal energy storage[2]; the solar field; high temperature receivers allowing for new cycles) are needed to reduce the cost of this technology.

Solar Heating and cooling (SHC) [3]: Innovative components for solar compact hybrid systems: It is necessary to improve the cost competitiveness, performance and acceptability of solar compact hybrid systems (heating systems combining a solar system and a backup-heater), addressing developments needed in the areas of improved components, easier installation (plug and play), improved control and operation methods, compact and simplified design. Single family homes and/or multifamily homes and/or public buildings are particularly challenging targets, requiring assessing the implications for the user in terms of operation and maintenance of the system.

Wind energy: Advanced control of large scale wind turbines and farms: The current progress in wind energy like larger wind turbines and farms, floating offshore wind, but also specific geographical challenges, require the development of advanced control strategies to improve efficiency and to further reduce the cost of wind energy as well as to increase the value of wind energy by improving the response to power system disturbances or electricity market conditions. While one of the primary challenges to be addressed is the development of new controls systems that treat the entire wind plant as a controls optimization problem it is also needed to optimize energy capture for individual assets with the wind-turbine-centric controls and to develop a better understanding of the wind resources and better wind forecasting methods. The overall challenge is to design an integrated approach to advanced operation of a wind turbine and/or farm, to improve performance for new and operating wind power plants and improve control of the wind turbine and/or farm, reducing the failure rate and therefore resulting in less operation and maintenance.

Ocean Energy: Increased performance and reliability of ocean energy subsystems: The priority for the ocean energy sector is to increase significantly the performance, reliability and survivability (15-20 years target) of ocean-energy devices developing solutions based on alternative approaches, sub-systems and materials. An integrated research and development approach is needed to reach maximum impact for the whole sector, and to make ocean energy commercially attractive for investors. The challenge resides in an improved understanding of component failure and low reliability in current ocean-energy devices, and in the development of ocean energy devices of improved performance, contributing to reduce the cost of ocean-energy. A fundamental challenge to be addressed is the development of novel and advanced reliable prime mover (e.g. system blades, pitch and hub for TECs and device structure for WECs) and the development of novel and advanced power take-off and control systems, converting mechanical energy from prime mover into grid compliant electricity.

Hydropower: Environmentally friendly hydropower solutions: There is a need to improve the understanding of river ecology and the relation to river regulation. The challenge is to provide reliable knowledge based on high quality quantified data sets and suitable methods, models and devices allowing policy makers and hydropower plant designers and operators to take decisions on the ecologic compatibility of planning and operating hydropower stations. To meet the overall objective of self-sustaining fish populations, measures such as habitat improvement, nature based environmental flows, sediment management (spawning area), and fish passage facilities or their combination may be implemented. To identify the most cost-effective measures or their-combination, it is necessary to include systematic investigations on selected power stations in various Member States of different climatic and ecologic conditions, identify fish species most at risk from hydropower projects. At the scale of the power plant the establishment of the correlations between design parameters of the plants and turbines respectively the survival rates for selected, representative species are needed to create models for fish mortality which should be verified at selected stations and assessed by testing/validating suitable prototypes/devices. Obtaining these data is fundamental to enable decision makers on all levels to plan, commission and operate hydropower plants with full respect of ecological regulations band policies and to meet the Water Framework Directive requirements.

Geothermal Energy: Shallow geothermal (low temperature) Improving borehole heat exchangers: Cost-effectiveness and efficiency of geothermal systems for heating and cooling in individual or multiple (i.e. district heating) installations can be improved introducing new and more efficient materials. Increased efficiency of heat exchangers will bring costs down and increase the attractiveness of geothermal energy for heating and cooling applications. The challenge is to develop new materials and systems to improve the efficiency of borehole heat exchangers by increasing the heat exchanged with the

surrounding ground and water to make geothermal sources for heating and cooling more economically attractive.

Combined Heat and Power: Development of highly-efficient, low-emission medium- and large-scale biomass-based CHP systems. CHP has a high potential for heat and electricity production in particular for decentralised applications. However, the challenge is to increase both technology performance and resource efficiency, while reducing environmental impacts. Cost effective, robust and low emission (both CO2 NOx and particles) medium and large-scale industrial CHP (>1MW) with high thermal and electrical efficiency and increased high-temperature heat potential up to 600°C need to be developed allowing the use of a wider base of solid, liquid or gaseous sustainable biomass and recovered feedstock. Ash use or removal, as well as ash challenges during combustion, requires particular attention. A significant step forward in the technology efficiency together with a reduction in resource consumption and reduced emissions is needed, to deliver reduced costs, both operation and maintenance, and increased attractiveness of renewable heating.

RES integration in the energy system: RES system support functions for the future energy system :In a future European energy scenario with very high shares of renewables (up to 100%) in the energy mix, system support functions that are provided today by synchronous generation will need to be provided by renewable generation or procured from third parties. RES should significantly contribute to a more stable operation of the future energy system, allowing growing percentage of renewable sources to displace traditional dispatchable generation. The challenge is to define and develop system support functions or ancillary services for the contribution of different RES technologies to stable and safe energy system operations in the best technical and economic way. Development and validation of system support functions from renewables, provided at transmission and distribution grid level, is needed; there is also a need to define the most suitable pathways to include the identified functionalities needed into the different RES development roadmaps, staggering their development in parallel to the development of the network connection codes.

For 2017, at least one of the following technology-specific challenges has to be addressed:

Photovoltaics: Developing next-generation increased-efficiency high-performance perovskite PV cells and products[4]: Recently the power conversion efficiency of lead halide perovskite–based thin film photovoltaic devices achieved exceptional progress. Improvements in solution processing and stability, combined with the earth abundance of the constituent materials, have made the lead halide perovskites among the most promising solar cell materials. The challenge is to further develop perovskite solar cells toward their theoretical power conversion efficiency and their commercially and environmentally viable fabrication. It is necessary to demonstrate device designs and price competitive fabrication processes of technologies with sufficient stability and at least 21% efficiency at cell level.

Concentrated Solar Power (CSP): New cycles and innovative power blocks for CSP plants: In spite of cost reductions in recent years, cost competitiveness remains a crucial barrier to the deployment of CSP plants. Several innovative concepts for new cycles and power blocks are being explored, which have the potential for lifecycle cost reduction thereby contributing to achieve the SET-Plan targets for CSP[5]. The challenge is to validate the feasibility of these concepts in relevant environment.

Solar Heating and cooling (SHC)[6]: Development of components for residential single-family solar-active houses: The potential of solar heating can be further exploited in residential buildings to cover a significant fraction of the heat demand. Developments are needed in the areas of improved components, innovative materials, improved control and operation methods, innovative

configurations. The challenge is for solar heating to cover at least 60% of the heat demand of a single family home, while minimizing the implications for the user in terms of operation and maintenance of the system.

Wind Energy: Reduction of environmental impact of wind energy: The challenge is to develop potential mitigating strategies or alternative solutions and to increase public acceptance of wind energy, thereby shortening consenting procedures, on the basis of an increased scientific understanding of the social and environmental impact of wind turbines and (clusters of) wind farms both on and off-shore (including floating) and to identify solutions for improved wind turbines/farms with less impact. Innovative mitigation actions could increase the deployment possibilities for wind energy, developing a better understanding of the impact of wind energy on the environment as there are still gaps in the knowledge which result in long consenting procedures and reduced deployment possibilities and secondly, developing innovative mitigation actions. Cooperation with NGOs and civil society groups is essential for further investigation of the roots of resistive behaviour as engaging and involving concerned communities can facilitate addressing this specific challenge.

Ocean Energy: Development of advanced ocean energy subsystems: innovative power take-off systems and control strategies: The challenge is to improve performance of ocean energy devices and reduce the overall cost of ocean energy by means of the demonstration of innovative power take-off systems and control strategies in order to increase power capture and power conversion efficiency, to reduce cost of components in the systems and to increase power quality. For the advanced sub-system an improved understanding of their interaction with energy resource is needed. Further, new system designs and methodologies are needed to enhance reliability and performance levels, making a step change in the sector and introduce as well a certain level of standardisation.

Hydropower: Increasing flexibility of hydropower: Hydropower is still amongst the largest sources of renewable energy. The challenge is however to make hydropower available in a time as short as possible independent of plant size. New technologies, generators and turbine designs need to be developed to increase ramping rates and to allow start-stop-cycles to reach up to 30 times per day depending on head and volume, while lifetime of components and respective life time prediction methods under heavy-duty operating conditions are considerably improved and at the same time avoiding adverse effects on downstream water courses. The refurbishment and simultaneous upgrading of hydropower stations offers a huge potential to increase renewable electricity production; the challenge is to leverage the storage potential of hydropower for grid balancing on the base of new technologies, finally allowing plant operators to operate successfully in the modern power markets and to make a significant contribution to European renewable energy objectives and policies.

Geothermal Energy: Deep Geothermal (medium-high temperature): Materials for geothermal installations: Geothermal resources at medium-high temperature can produce at competitive costs electricity, heat or a combination of both. With the increase of the temperature the geothermal fluids become more aggressive, corrosion and scaling might occur and the efficiency and longevity of the plant components are at stake. Geothermal plant reliability must be improved. The challenge is to develop new materials and systems to increase efficiency and longevity of the installations, by securing the integrity of the well and of the equipment, with particular reference to the pumps. Reduced well losses and increased efficiency and longevity of the plant components will lower the risks associated with deep geothermal installations and increase cost-competitiveness by reducing the replacement frequency of components.

Combined Heat and Power: Transforming renewable energy into intermediates: Biomass and other renewable and waste carbon sources offer a far unexplored potential as storable renewable energy source in integrated systems. Improving storage characteristics of upgraded biomass and other renewable and waste carbon sources will provide a flexible element for heat and power production and for balancing the grid stability, as well as for transport applications, therefore majorly contributing to the EU 2020 energy objectives. The challenge is to develop viable processes and deliver possible economic benefits along the value chain via power-to-gas and/or power-to-liquid concepts for RHC, transport and storage applications, using hydrogen or syngas or liquid renewable carriers produced from excess electricity from PV or wind for biomass gasification or liquefaction or in biogas plants to enhance the yields of syngas or biogas as well as for waste carbon upgrading.

RES integration in the energy system: RES system support functions for the future energy system: In a future European energy scenario with very high shares of renewables (up to 100%) in the energy mix, system support functions that are provided today by synchronous generation will need to be provided by renewable generation or procured from third parties. RES should significantly contribute to a more stable operation of the future energy system, allowing growing percentage of renewable sources to displace traditional dispatchable generation. The challenge is to define and develop system support functions or ancillary services for the contribution of different RES technologies to stable and safe energy system operations in the best technical and economic way is needed. Proposals should propose, develop and validate system support functions from renewables, provided at transmission and distribution grid level, and include the definition of the most suitable pathways to include the identified functionalities needed into the different RES development roadmaps, staggering their development in parallel to the development of the network connection codes.

Proposals should address one or more of the technology-specific challenges described above. Combining renewables areas, when new innovative ideas could bring breakthrough, is welcome, but the proposal should have a clear focus on at least one of the technology specific challenges. The proposals should bring technology solutions to TRL 4-5 (please see part G of the General Annexes) at the end of the action.

Environment, health and safety issues shall be considered in all developments and appropriately addressed.

Proposals shall explicitly address performance and cost targets together with relevant key performance indicators, expected impacts, as well as provide for development of explicit exploitation plans.

Technical issues, synergies between technologies, regional approaches, socio-economic and environmental aspects from a life-cycle perspective (including public resistance and acceptance, business cases, pre-normative and legal issues, pollution and recycling) need to be appropriately addressed wherever relevant. As in many cases, renewable energy projects are part of complex ecosystems, with links to broader environmental, socioeconomic and livelihood issues that are of particular relevance to local communities, multidisciplinary research designs that integrate contributions also from the social sciences and humanities are encouraged.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 to 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

Further to what mentioned for the specific technologies, proposals focusing on the technology specific challenges a) to h) should address all the general impacts listed below:

- Reduce the technological risks for the next development stages;
- Significantly increased technology performance;
- Reducing life-cycle environmental impact;
- Nurturing the development of the industrial capacity to produce components and systems and opening of new opportunities;
- Contributing to the strengthening the European industrial technology base, thereby creating growth and jobs in Europe;
- Reducing renewable energy technologies installation time and cost and/or operational costs, hence easing the deployment of renewable energy sources within the energy mix;
- Increasing the reliability and lifetime while decreasing operation and maintenance costs, hence creating new business opportunities;
- Contributing to solving the global climate and energy challenges.

The proposals focusing on the technology-specific challenge i) in 2016 and 2017 should address all the following impacts:

- Improving EU energy security;
- Making variable renewable electricity generation more predictable and grid friendly, thereby allowing larger amounts of variable output renewable sources in the grid;
- Bringing cohesion, coherence and strategy in the development of new renewable energy technologies;
- Contributing to solving the global climate and energy challenges.

<u>Cross-cutting Priorities:</u>

- Contractual public-private partnership
  EeB
  Socio-economic science and humanities

[1]A related activity is supported under topic NMBP 19-2016 "Advanced materials solutions and architectures for high efficiency solar energy harvesting", included in the work programme of 'Leadership in enabling and industrial technologies – Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing', in which the focus lies on the materials and materials combinations.
[2]A related activity is supported under topic NMBP 19-2016 "Advanced materials solutions and architectures for high efficiency solar energy harvesting", included in the work programme of 'Leadership in enabling and industrial technologies – Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing', in which the focus lies on materials.
[3] Activities addressing this challenge contribute to the PPP on Energy-efficient Buildings.
[4]A related activity is supported under topic NMBP 19-2016 "Advanced materials solutions and architectures for high efficiency solar energy harvesting", included in the work programme of 'Leadership in enabling and industrial technologies – Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing', in which the focus lies on the materials for a broader range of technologies.
[5]The Steering Group of the SET-Plan has agreed on the following two targets for CSP: (i) 40% cost reduction by 2020 (from 2013) translating into a supply price < 10 c€/kWh for a radiation of 2050 kWh/m2/year (average in Southern Europe); and (ii) new cycles (including supercritical ones) with a first demonstrator by 2020.
[6]Can be considered contributing to the PPP Energy-efficient Buildings

Forest-based Sector
Technology Platform

Topic ID and title	LCE-08-2016-2017 – Development of next generation biofuel technologies					
Status	Open	Opening date	20/09/2016	Deadline 1 Deadline 2	05/01/2017 No	
Type of action	RIA Research and Innovation action					
FTP subsector	Process industries					
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high	
	3.4 Biorefinery concepts				medium	
					low	

Specific Challenge:

New sustainable biofuels technologies need to be developed that improve performance, notably with regards to the following sub-challenges:

- improving the technology competitiveness by upgrading the conversion efficiency and possibly diversifying the technology;
- improving the feedstock supply by reducing the supply costs and possibly diversifying the biomass feedstock.

Scope:

Proposals should aim at developing the next wave of sustainable liquid biofuels by moving technologies from TRL 3-4 to TRL 4-5 (please see part G of the General Annexes).

Environment, economic and social issues including health and safety should be considered and appropriately addressed. A methodology that permits robust and reliable sustainability assessment of the environmental (notably in terms of GHG performance), economic and social benefits with respect to current technologies should be included.

Biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded.
Proposals should address both sub-challenges described above, while the main effort in 2016 shall be in addressing sub-challenge a) and in 2017 sub-challenge b). They should also address the particular transport sectorial needs where relevant.

In particular, proposals shall address one of the following:

In 2017:

- Biofuels from CO2 in industrial waste flue gases through biochemical conversion by autotrophic (chemo and photo –autotrophic) micro-organisms;
- Biofuels from organic fraction of municipal and industrial wastes through thermochemical, biochemical or chemical pathways with improved performance and sustainability;
- Biofuels from phototrophic algae & bacteria with improved performance and sustainability.
- An important element will be an increased understanding of risks (whether technological, in business processes, for particular business cases, or otherwise in each area), risk ownership, and possible risk mitigation. Proposals shall therefore include appropriate work packages on this matter.
- Proposals shall explicitly address performance and cost targets together with relevant key performance indicators, expected impacts, as well as provide explicit exploitation plans.
- The Commission considers that proposals requesting a contribution from the EU of between EUR 3 to 6 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

The new developed technology pathways should improve the economic, environmental and social benefits of biofuels. Favourable energy and GHG balances are expected, as well as a significant cost reduction, which would permit these fuels to compete favourably with conventional biofuels. A favourable performance on secure and affordable energy supply and diversified, cheap feedstock supply is expected. In addition, positive impacts on enhancing Europe's competitiveness should be anticipated where appropriate.

Topic ID and title	LCE-19-2016-2017 – Demonstration of the most promising advanced biofuel pathways				
Status	Open	Opening date	11/05/2017	Deadline 1 Deadline 2	07/09/2017
Type of action	IA Innovation action				
FTP subsector	Process industries				
FTP SRA	3.2 Renewable energy solutions			FTP relevance	high
	3.4 Biorefinery concepts				medium
					low

Specific Challenge:

It is essential to diversify the technology portfolio and feedstock basis to allow competitive production of advanced biofuels for use in transport.

The following sub-challenges should be addressed:

- improving the technical and economic feasibility of the production of new and advanced liquid biofuels;
- demonstrating the feasibility of using feedstock particularly suitable for transport energy purposes.

Scope:

Proposals shall aim at moving technologies that reached already TRL 5-6 to TRL 6-7 (please see part G of the General Annexes) through industrial demonstration projects in line with the Implementation Plan of the EIBI[1]. Projects should target the most promising advanced liquid biofuel production pathways incorporating new or improved biochemical/thermochemical/chemical conversion together with upgrading technologies and valorisation of co-products that improve the economic viability of the fuel production.

Environment, economic and social issues[2] including health and safety should be considered in the whole life cycle and appropriately addressed. A methodology that permits robust and reliable assessment of the environmental (notably in terms of GHG performance), economic and social benefits with respect to current technologies should be included.

The proposals should respect the principle of the minimum bioenergy content laid out in the EIBI Implementation Plan: 'At least 70% of the bioproducts produced by the plant shall be bioenergy (biofuels, heat, power) , calculated on energy basis.

Biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded.

Proposals should address both sub-challenges described above, while the main effort in 2016 shall be in addressing sub-challenge a) and in 2017 sub-challenge b). Where synthesis gas or intermediate energy carriers are produced, their final use for production of advanced biofuels for transport must be demonstrated.

In particular, proposals shall address one of the following:

In 2017:

- Biofuels from the carbon content in flue gases of industrial wastes through biochemical and/or biological conversion;

- Biofuels from aquatic biomass;
- Liquid biofuels from wastes and residues (forest, agricultural, the organic fraction of municipal and industrial wastes).
-

Proposals shall explicitly address performance and cost targets together with relevant key performance indicators and the expected impacts. Industrial involvement in the consortium and explicit exploitation plans are a prerequisite.

Proposals shall include a work package on the business case of the technology solution and which identifies potential issues of public acceptance, market and regulatory barriers, including standardisation needs. It should also address, where appropriate, synergies between new and existing technologies and other socio-economic and environmental aspects from a life-cycle perspective. Furthermore, they shall address the risks (technological, business, process) and their possible mitigation.

Opening the project's test sites, pilot and demonstration facilities, or research infrastructures for practice oriented education, training or knowledge exchange is encouraged.

The Commission considers that proposals requesting a contribution from the EU of between EUR 10 to 15 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
Demonstrating advanced biofuel technologies at large industrial scale reduces the technological risks and paves the way for subsequent first-of-a-kind industrial projects. For this purpose, the scale of the proposals should permit obtaining the data and experience required so that up-scaling to a first-of-a-kind, industrial project can be envisaged as a next step. Favourable energy and GHG balances are expected. The demonstrated industrial concepts should ensure the techno-economic feasibility of the entire value chain and have the potential for a significant social and economic impact, notably in terms of job creation, economic growth and safe and affordable energy supply.

Cross-cutting Priorities:
Socio-economic science and humanities

[1]http://setis.ec.europa.eu/set-plan-implementation/european-industrial-initiatives-eiis/eii-implementation-plans
[2]For example, will this solution bring positive changes to our lives and society? Will it support socially inclusive growth? What are the positive and negative externalities? Will it boost the creation of jobs and economic opportunities; revitalise the economy?

Forest-based Sector
Technology Platform

Topic ID and title	LCE-21-2017 – Market uptake of renewable energy technologies					
Status	Open	Opening date	20/09/2016	Deadline 1 Deadline 2	05/01/2017	
Type of action	CSA Coordination and support action					
FTP subsector						
FTP SRA	3.4 Biorefinery concepts			FTP relevance	high	
	2.4 Secured wood supply, forest operations and logistics				medium	
					low	

Specific Challenge:
Since the adoption of RES Directive in 2009[1], most Member States have experienced significant growth in renewable energy consumption and the EU and large majority of Member States are on track towards 2020 RES targets. Considering Member States' current and planned policy initiatives, their current implementation rates and the various barriers to renewable energy development, the need for improvements for some RES technologies, like offshore wind, advanced biofuels, CSP and geothermal, however, becomes apparent.

To ensure the level of growth needed to deliver the technology deployment rates at least to the level planned in the National Renewable Energy Action plans and their necessary contribution to the 2020 RES targets. EU targets for renewable energy, and to create the appropriate business environment for EU industrial leadership in low-carbon energy technologies, a number of important market-uptake challenges need to be addressed.

Scope: One of the following technology-specific challenges has to be addressed:

1. Photovoltaics: Tackling the bottlenecks of high penetration levels of PV electricity into the electric power network: PV electricity is not necessarily generated when mostly needed. Furthermore, small distributed PV systems feed into the grid possibly all at the same time challenging grid stability. To enable the effective and efficient integration of growing shares of PV power into the grid, the idea of PV producers becoming “prosumers” – both producers and consumers of energy – is gaining ground while “self-consumption” is becoming a major driver for the installation of small distributed PV systems. To facilitate this to happen, the following sub-challenges need to be addressed:

- Development of solutions for innovative system-integration and power-management for households/larger buildings (in general small distributed PV systems) including storage, particularly addressing the impact of self-consumption on the operation of the grid and the value of PV electricity when aggregated and offered to the wholesale market;
- Based on these solutions, elaboration of business and management models, including cost-benefit analysis and assessing economic feasibility for the European urban landscape.

2. Heat Pumps: Accelerate the penetration of heat pumps for heating and cooling purposes: Heating and cooling represents almost 50% of the final EU energy consumption and cooling demand is increasing. The cost associated with the purchase and installation of heat pumps remains an obstacle for a wider penetration on the market. In order to accelerate the penetration of heat pumps for heating and cooling purposes, proposals should address the following challenges:

- identification of the most promising cost reduction options for CAPEX, installation costs, and OPEX as well as development of EU wide scenarios of deployment; proposed prioritisation of R&I investments;
- development of solutions for innovative system integration and integrated power management for household/industrial buildings.

3. CSP: Facilitating the supply of electricity from CSP plants in Southern Europe to Central and Northern European countries - By means of CSP Southern European countries could supply renewable electricity on demand to the entire European energy market, including Central and Northern European countries – in particular, the Renewable Energy Directive foresees cooperation mechanisms to this end to allow Member States to meet their national targets cost-efficiently. The exploitation of this possibility would greatly facilitate the market uptake of CSP, but this has not happened so far. The challenge is to identify all issues (technological, legal, economic, political, social, financial, etc.) that may constitute an obstacle to the supply of renewable electricity on demand from CSP plants to Central and Northern European countries (other than those bottlenecks related to building new physical interconnections), and to identify possible solutions and propose options for addressing the issues in the context of a concrete project case.

4. Wind energy: Increasing the market share of wind energy systems: One of the following specific sub-challenges need to be addressed: i) Develop spatial planning methodologies and tools for new onshore wind and repowering of old wind farms taking into account environmental and social impacts but also the adoption of the latest developments in wind energy technology; ii) Identify the bottlenecks for further deployment in Europe and the regulations which limit the adoption of technological innovation and their deployment possibilities; iii) Increase the social acceptance and support for wind energy in 'wind energy scarce regions' using, with solid involvement of social sciences and humanities and local communities and civil society to understand best practices and to increase knowledge about social and environmental impact of wind energy.

5. Geothermal energy: Tackling the bottlenecks of high penetration levels for geothermal energy systems: Geothermal energy suffers from a level of penetration that is limited compared to its potential and there are growing concerns regarding the environmental and the social impact of geothermal installations. The challenge is to remove environmental and social concerns that pose barriers limiting the contribution of geothermal energy to the energy mix. The challenge is to assess the nature of public concerns and the elements that influence individual and group's perception of geothermal installations, to increase the understanding of the socio-economic dimension of geothermal energy, and to promote change in community responses to new and existing geothermal installations. Different technologies and possible technological solutions, with particular reference to reinjection of incondensable gases in deep geothermal plants, are key elements of the environmental and social impact assessment. Specific challenges related to deep and shallow geothermal energy require separate considerations. Risk management strategies and adequate technology selection, for example induced seismicity or emission reduction should be addressed, when relevant.

6. Sustainable Fuels: Facilitating the market roll-out of liquid advanced biofuels and liquid renewable alternative fuels: The challenge is to enable commercialisation of advanced biofuels to help meeting the 10% target for Renewable Energy Sources in the EU transport energy consumption by 2020 and then contribute to the EU targets of 27% share of Renewable Energy Sources in the EU energy consumption and of 40% GHG reduction by 2030. Fossil fuels and biofuels produced from starch, sugar and oil fractions of food/feed crops are excluded. Proposals shall address one or several of the following sub-challenges:

a. Development of tools for predicting the fuel cost in relation to different supply and demand scenarios taking into account technology performance, economies of scale, feedstock costs, market demand, socio-economic aspects, etc. and including sensitivity analysis through conceptual engineering and cost estimation for the most common conversion routes;
b. Development and implementation of innovative crop rotation schemes for the production of lignocellulosic biofuels with improved sustainability;
c. Development of numerical tools for prediction of fuel and fuel blend properties and model validation to facilitate the certification process in the transport sector;
d. Development of communication strategies to increase the public acceptance for advanced biofuels for the most common conversion routes;
e. Setting up sustainable and cost-effective European biomass supply chains for the industrial production of advanced biofuels;
f. Actions aiming at development and implementation of common standards and certification schemes for fuels at EU-level;
g. Actions aiming at harmonization of national standards and certification schemes for fuels at a European level;
h. Development of tools and actions for capacity building among relevant stakeholders of all steps in the advanced biofuel value chain aiming at substantially reducing biofuel costs at large scale.

Proposals should address one of the sectorial technology challenges mentioned above. The complexity of these challenges and that of the related market uptake barriers calls for multi-disciplinary research designs, which may include contributions also from the social sciences and humanities. Regional specificities, socio-economic, spatial and environmental aspects from a life-cycle perspective shall be considered. For all actions, the consortia should involve and/or engage relevant stakeholders and market actors who are committed to adopting/implementing the results. Where relevant, proposals should also critically evaluate the legal, institutional and political frameworks at local, national and European level and how, why and under what conditions these (could) act as a barrier or an enabling element.

Participation of developing 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.

The Commission considers that proposals requesting a contribution from the EU of between EUR 1 to 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
It is expected to increase the share of renewable energy in the future energy mix and to increase the share of sustainable advanced biofuels and renewable alternative fuels in the final EU transport energy consumption or facilitate those increases in the future. In addition, contribution to market understanding for possible policy and regulatory development is anticipated.

Cross-cutting Priorities:
Socio-economic science and humanities

[1]Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources

Forest-based Sector
Technology Platform

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

Call name

Greening the economy

Topic ID and title	SC5-07-2017 – Coordinating and supporting research and innovation actions on the decarbonisation of the EU economy				
Status	Forthcoming	**Opening date**	08/11/2016	**Deadline 1** **Deadline 2**	07/03/2017
Type of action	CSA Coordination and Support action				
FTP subsector					
FTP SRA	1.1 The performance of the sector in a perspective of global change			**FTP relevance**	high
	1.2 Citizens' perceptin of the sector and its products				medium
	2.4 Secured wood supply, forest operations and logistics				low

Specific Challenge:
There is a constant need for strengthening the information flow and enhancing the exchange of experience on on-going and future European and international research and innovation activities concerning low-carbon transition scenarios, as well as for maintaining continuous dialogue between the scientific community, economic and societal stakeholder groups and policy-makers in order to better support EU policy processes targeting the decarbonisation of Europe's economy between 2030 and 2050 and beyond.

Scope:
The action will support the work of a panel of personalities, expected to be established by the European Commission. The panel's role will be to provide strategic-level, trans-disciplinary advice to the European Commission in this area of research and to ensure co-design through appropriate engagement of relevant stakeholders. This action should create a network of leading scientists and relevant research projects in the field of EU decarbonisation strategies, contributing to the definition of robust scientific statements and coverage of knowledge gaps. The project should from an early stage establish links with policy-makers and stakeholder groups at EU, national and sub-national level, in order to inform policy and business processes and set up feedback loops. The project should provide foresight analysis on emerging issues, produce sectoral and macro-economic syntheses emanating from results of EU-funded projects, and elaborate recommendations on current and emerging policy-relevant issues. It should also engage in active communication and dissemination of results. This action will have to be implemented in close cooperation with the European Commission's Directorate General for Research and Innovation in order to allow for constant alignment with and support for policy initiatives.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2.5 million and EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action shall be funded.

Expected Impact:
Project results are expected to contribute to:

- enhanced coordination of European and Member State research and innovation actions on decarbonisation pathways and scenarios;
- better informed policy and business processes within a cross sectoral and integrated perspective, based on the latest scientific findings and recommendations for managing a low-carbon transition at various levels;
- the introduction and further development of the notion of cost-effectiveness, resulting from better medium-to-longer term planning and coordination.

Delegation Exception Footnote:
This activity directly aimed at supporting the development and implementation of evidence base for R&I policies and supporting various groups of stakeholders is excluded from the delegation to EASME and will be implemented by the Commission services.

Topic ID and title	SC5-15-2016-2017 – Raw materials policy support				
Status	Forthcoming	Opening date	08/11/2016	Deadline 1 Deadline 2	07/03/2017
Type of action	CSA Coordination and Support action				
FTP subsector	Woodworking; whole value-chain				
FTP SRA	2.4 Secured wood supply, forest operations and logistics			FTP relevance	high
	2.3 Enhance biomass production				medium
	1.1 The performance of the sector in a perspective of global change				low

Specific Challenge:

The EU is highly dependent on raw materials that are crucial for a strong European industrial base, an essential building block of the EU's growth and competitiveness. 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-technology challenges at local, regional, national EU and global levels, as well as gaps in the knowledge on raw materials to foster the supply from the EU sources.

While the challenge to secure the raw materials supply is of a global nature, the actions to respond to the challenge are usually implemented at regional and local levels. There is a need to identify and bring together the EU regions with raw materials production capacity and common Smart specialisation objectives to exploit synergies, gain the trust of citizens and jointly improve the framework conditions, availability and performance of the industry, social aspects, stimulate investment and exchange of knowledge, foster innovation and competitiveness of industries in the raw materials value chains etc.

Specifically, the supply of CRMs to EU is at risk as they are often mined as by-products and still have global recycling rates below 1% after decades of use. There is a need for an expert group covering all the CRMs and as much as possible of their value chains, which would be able to comprehensively map CRM sources, provide recommendations for sourcing and better use of CRMs, including improving the European standards for efficient treatment of WEEE and waste batteries and other end-of-life products, while building on the experience and knowledge of existing specific groups, such as ERECON[1] and CRM-Innonet.

One of the major challenges regarding the EU knowledge base on primary and secondary mineral raw materials is the quality, harmonisation of the collected data and information sharing at the different levels within the EU. There is a need to optimise collection of data in Member States in support of the EU Knowledge Base on Raw Materials (EC Raw Materials Information System – RMIS[2]).

A specific challenge for the primary raw materials sector is an access to land within the land-use planning in parity with other activities. Most of the EU is densely populated and there are therefore conflicts of land-use caused by the competing interests of different activities and interest with economic requirements such as urbanization, nature conservation, agriculture, infrastructure etc.

For the secondary raw materials sector a proper collection of waste is a pre-condition for optimal recovery of materials from waste, which varies across the EU, Member States and their local governments who apply many different waste collection systems from co-mingled collection systems to separate collection. Decision-makers need more information about the overall performance of

different systems, including their economic performance, and a better understanding of the conditions that are necessary for shifting to alternative, better-performing waste collection systems.

Scope:
Projects should include a work-package to cluster with other projects financed under this topic and – if possible – with other relevant projects in the field funded by Horizon 2020, in support of the EIP on Raw Materials.

Proposals shall address only one of the following issues:
a) Expert network on Critical Raw Materials (2016): The proposed action should develop primarily an EU expert network or structure of networks covering all CRMs and where possible, include the stakeholders covering as much of the value chains as possible. [3] In case the new list will not be available at the deadline of the call, proposals should demonstrate the flexibility of incorporating new CRMs in the scope of the project. Proposals should build on the experience and knowledge gained from similar initiatives such as the ERECON [4] a network on Rare Earth Elements, and CRM_InnoNet.

In order to support decision making of the producers and users of raw materials and the policy makers the projects should cover all the following points:

- map, comprehensively assess and quantify estimated amounts of existing primary and secondary sources of and alternatives to the different CRMs;
- estimate the expected EU demand of various CRMs in the future and identify major trends;
- provide policy and technology recommendations for actions improving the production of the various primary and secondary CRMs and actions for their potential substitution, in order to secure their supply and decrease the relative dependence upon their imports;
- provide a plan for transparent consultation with relevant external stakeholders and effective communication of the findings to the professional and general public across the EU;
- In the case of secondary CRMs, the mapping information on Waste Electrical and Electronic Equipment (WEEE) and waste batteries and other relevant end-of-life products within the EU is crucial, as well as the need to contribute to the further development of European standards for the treatment of WEEE in order to optimise the recovery of CRMs, identifying the most relevant WEEE categories and additional standardisation needs for the further development of CENELEC standards under the European Commission Mandate M/518 EN.

The Commission considers that for this sub-topic, proposals requesting a contribution from the EU of up to EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

b) Good practice in waste collection systems (2017): Proposals should cover all the following points:

- map and assess existing waste collection systems in a representative set of EU Member States for a wide range of waste streams, including packaging and paper waste, and end-of-life products (e.g. electrical and electronic equipment, batteries, transport vehicles, tyres, construction products, furniture);
- where feasible assess advantages and disadvantages of different approaches – including environmental and socio-economic impacts – with quantified costs and benefits;
- identify good practices and key elements for effective and efficient waste collection systems, as well as the barriers for implementation and possible solutions to overcome bottlenecks taking into consideration the adaptability of solutions to different regions of the EU;

- validate the identified key elements, good practices, and the measures to overcome obstacles by consulting stakeholders through a participatory approach involving citizens and plan targeted dissemination actions.

The Commission considers that for this sub-topic, proposals requesting a contribution from the EU of up to EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

c) Optimising collection of raw materials data in Member States (2017): Proposals should cover all the following points:

- map and analyse the current situation of collection of data and data sources in all Member States;
- provide recommendations for improvement of data sets and for EU level harmonization with justified benefits for the EU and the Member States and taking into account the INSPIRE Directive in order to enhance data availability and quality in the Raw Materials Information System (RMIS) [51];
- demonstrate the applicability of recommendations on a number of improved data sets at Member States level. Improved data sets related to primary mineral raw materials should include for example: data on mineral occurrences and deposits; economic and technical data on mineral exploration and extraction; data on the environmental and social dimensions of extraction and, minerals intelligence data. Data sets related to secondary mineral raw materials should build on raw materials flows at Member state level (Materials Systems Analysis) and be presented in a form of Sankey diagrams. Other data sets on minerals secondary raw materials could also be considered;
- involve all mandated key players for primary and secondary mineral raw materials in Member States, including in particular data providers and relevant public authorities and bodies;
- ensure access to information on how data and best practices will be shared with the wider EU raw materials community, in particular via the Raw Materials Information System (RMIS).

The Commission considers that for this sub-topic proposals requesting a contribution from the EU of up to EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

d) Linking land use planning policies to national mineral policies (2017): Proposals should cover all the following points:

- review and analyse how exploration and extraction of mineral raw materials in Member States are integrated in land use planning and practices at all levels of implementation (national, regional, local) seeking the harmonization and convergence in national approaches towards minerals policies and land-use planning policies and practices;
- consider how to best link land-use planning with the concept of safeguarding valuable mineral deposits (such as mineral deposits of public importance) in order to ensure the current and future access to the deposits and to avoid 'land sterilization';
- take into account the following relevant issues: a) the integration of land use and subsurface planning, b) the assessment of different options for land use where there is no pre-exclusion, c) the INSPIRE Directive, d) information needed in the process, e) e-procedure, f) smart regulation, g) the infrastructure planning and approaches;

- involve civil society, practitioners, land-use planners and mining public authorities at local, regional and national levels and should develop a dissemination strategy;
- provide recommendations and publish guidance documents to promote a harmonized approach and good practise sharing among Member States in order to ensure a more effective access to raw materials;
- build on the report 'Recommendations on the framework conditions for the extraction of non-energy raw materials in the European Union' (2014) of the Ad-Hoc Working Group on exchange of best practices on mineral policy and legal framework, information framework, land-use planning and permitting;
- provide methodologies, information and data that can be included in the EIP Raw Materials Scoreboard and can also contribute to the Raw Materials Information System (RMIS) [15].

The Commission considers that for this sub-topic, proposals requesting a contribution from the EU of up to EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

e) EU network of mining and metallurgy regions (2017): The purpose is to create a sustainable EU network of regions dedicated to mining (including exploration), processing and metallurgy aiming at improving related framework conditions, social aspects and industry competitiveness.

While the issues of recycling, re-use and product life cycles are covered by the topic CIRC-03-2016: 'Smart Specialisation for systemic eco-innovation/circular economy' in the call 'Industry 2020 in the Circular Economy', the focus of this topic is on mining and metallurgy.

Specifically, this network should cover all the following points:

- establish coherent co-ordination and support mechanisms among a representative number of EU regions, and identify and engage the other relevant EU regions;
- establish the right raw materials framework conditions based on good practices in the addressed regions, including administration, land use planning, investment conditions, training and attracting skilled workforce;
- define Social Licence to Operate (SLO)[17] guidelines and develop a toolbox improving communication and transparency during the permitting and licensing procedures and in the production cycle (from exploration, mine operation to rehabilitation and residues and tailings management) by mobilising all the concerned EU's stakeholders (relevant authorities municipalities, mining and other relevant companies, civil society organisations and local communities) which can be affected by a mining project;
- explore and promote in and across the regions potential synergies between raw materials, value chains, market and societal players in order to create new business opportunities and economic growth;
- plan and establish operational synergies between R&I investments (public and private) and the European Structural and Investment Funds (ESIF) to strengthen competitiveness of the industry, through different improved R&I infrastructure and capacity, and to foster market uptake and replication of innovative solutions in the relevant fields;
- perform communication activities across the EU to present, challenge and validate the outputs of the project;
- involve relevant competent authorities, private sector, research and academic organisations, civil society and experts in relevant social sciences and humanities. Participation of regional authorities from all the regions addressed in the proposal is compulsory;

- identify synergies and collaborate closely with the relevant established or new initiatives at the EU and national levels, such as EIP on Raw materials and KIC on Raw materials[8] and link to circular economy and resource efficiency policies;
- use a multidisciplinary approach, involving in particular social sciences and humanities, in order to better understand the different aspects of Social Licence to Operate (SLO) in mining in a given cultural context. Proposals should also benchmark the EU SLO guidelines and initiatives with those developed internationally (Canada, Australia, USA, etc.);
- provide methodologies, information and data that can be included in the EIP on Raw Materials Scoreboard and can also contribute to the Raw Materials Information System (RMIS)[5], with special regard to the regional dimension.

The Commission considers that for this sub-topic, proposals requesting a contribution from the EU of up to EUR 3 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

f) EU network of regions on sustainable wood mobilisation (wood supply) (2017): The objective is to create a European network of regions for improved and sustainable supply of primary wood raw material that will contribute to improved industrial competitiveness and rural development, whilst preserving EU forest ecosystems and forests' capacity to deliver all their economic, social and ecological functions, and ensuring consistency with relevant EU policy goals (e.g. EU Bioeconomy Strategy, 7thEnvironmental Action Programme, EU Biodiversity Strategy, EU Forest Strategy, EU Nature legislation; EU climate policy). The network's activities shall cover all the following points:

- establish coherent co-ordination and support mechanisms among a geographically and socio-economically representative number of regions, and identify and engage other relevant EU regions;
- plan and establish operational synergies between R&I investments (public and private) and the European Structural and Investment Funds (ESIF), notably European Agricultural Fund for Rural Development (EAFRD), to facilitate uptake and replication of innovative solutions;
- identify, exchange and widely disseminate good practices (replicable between the regions) in the area of sustainable wood mobilisation with an aim to establish the right framework conditions. This should build on the European Commission/Forest Europe/UNECE/FAO 'Good practice guidance on sustainable mobilisation of wood in Europe' and relevant projects (such as SIMWOOD), and contribute to the strategic orientations of the EU Forest Strategy[10];
- explore and promote potential synergies between materials, value chains, markets and societal players in order to create new business opportunities and economic growth;
- identify synergies and collaborate closely with the relevant established or new initiatives at the EU and national levels, such as the EIPs on Raw Materials and for Agricultural Productivity and Sustainability.

The areas of focus for the regional network activities should at minimum cover the following aspects of framework conditions: (a) forest ownership and land tenure, sustainable forest management, administration, co-ordination and planning, including silvicultural measures; (b) infrastructure and logistics; (c) organisation and transparency of the markets; (d) financing sourcing, legal and fiscal measures; and (e) education, training and skills.

Participation of competent regional authorities relevant to sustainable wood mobilisation is required, notably in the context of establishing operational synergies in the research and innovation area. Participation of relevant competent authorities and actors for sustainable wood mobilisation, e.g.

chambers of agriculture and forestry, forest owners/managers associations, academia, research technology platforms/centres, and EU stakeholder organisations, is encouraged.

The Commission considers that for this sub-topic, proposals requesting a contribution from the EU of up to EUR 1.5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts. Up to one action for this topic part shall be funded.

Expected Impact:

The project is expected to contribute to:

a)

- achieving the objectives and the implementation of both the Raw Materials Initiative[11] and the EIP on Raw Materials, in particular in terms of the access to critical raw materials (CRMs);
- better informed decision making by the EU and Member States policy makers and the producers and users of raw materials regarding the supply of raw materials;
- development of European standards for the treatment of WEEE, waste batteries and other relevant end-of-life products that would help towards optimising the recovery of critical raw materials;
- increased recovery rates in the EU as regards CRMs from WEEE, waste batteries and other relevant end-of-life products;
- in longer term reduced EU dependency on imports of CRMs;
- improved awareness of relevant external stakeholders and general public across the EU about importance of the critical raw materials for society, challenges related to their supply and about proposed solutions;

b)

- achieving the objectives of the EIP on Raw Materials in terms of waste management framework conditions;
- better-informed decision-making at EU, national and local levels with regards to waste management framework conditions;
- better performing waste collection systems in EU Member States, including socio-economic and environmental impacts;
- in longer term, reduced EU dependency on imports of raw materials;

c)

- achieving the objectives of the EIP on Raw Materials, particularly in terms of developing the EU Raw Materials Knowledge Base (Raw Materials Information System RMIS [12]);
- improving the quality assurance and accessibility of primary and secondary mineral raw materials data in the EU;
- adding to transparency of Member state and EU mineral raw materials data and information;
- facilitating better informed decision-making for raw materials policy at EU and Member State levels, as well as for facilitating investment decisions by industry;

d)

- achieving the objectives of the EIP on Raw Materials, particularly in terms of improving conditions for sustainable access and supply of raw materials in the EU;
- more transparent and efficient exploration and mining permitting and licensing processes in the EU;
- better land-use planning based on a better knowledge of identified or potential deposits and their potential environmental impacts at EU level;
- bringing mineral resources in parity with other natural resources within land use planning whilst implementing the environmental acquis;

e)

- achieving the objectives of the EIP on Raw Materials in terms of improving conditions for sustainable access and supply of raw materials in the EU;
- creating a longer term sustainable network;
- establishing operational synergies between R&I investments and ESIF to improve R&I infrastructure and capacity and to foster market uptake and replication of innovative solutions in the relevant fields;
- improved framework conditions at regional level leading to a more transparent and secure environment for investment in new mining and metallurgy projects in the EU and economic growth in the regions;
- improving awareness of the importance of raw materials for our society and about new ways of mining taking into account environmental, health and safety considerations;
- helping stakeholders to make informed decisions about new mining and metallurgy projects in the EU through engagement of local communities, facilitating social agreements, improving the awareness, gaining citizens' acceptance and trust in a sustainable raw materials production in the EU;
- effective implementation and widespread use of the Social Licence to Operate (SLO) guidelines and toolbox in practice;

f)

- achieving the objectives on sustainable wood supply of the EIP on Raw Materials, the EIP for Agricultural Productivity and Sustainability, the new EU Forest Strategy and the EU Bioeconomy Strategy;
- improving knowledge and framework conditions for sustainable wood mobilisation that result in increased supply of primary wood raw materials to the forest-based bioeconomy, whilst preserving EU forest ecosystems and forests' capacity to deliver all its functions;
- innovation at regional and local levels leading to increased wood-based industrial competitiveness and rural development;
- creation of clusters of regions with common interests on wood mobilisation;
- establishing operational synergies between R&I investments and ESIF to improve R&I infrastructure and capacity and to foster market uptake and replication of innovative solutions in the relevant fields for sustainable wood mobilisation.

<u>Cross-cutting Priorities:</u>

Socio-economic science and humanities

[1]http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/erecon/index_en.htm
[2]https://ec.europa.eu/jrc/en/scientific-tool/raw-materials-information-system
[3]The latest public EU list of Critical Raw Materials, expected to be updated in 2016/2017 (otherwise the list of 2014 is applicable (COM(2014) 297)).
[4]http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/erecon/index_en.htm
[5]https://ec.europa.eu/jrc/en/scientific-tool/raw-materials-information-system
[6]https://ec.europa.eu/jrc/en/scientific-tool/raw-materials-information-system
[7]'Social Licence to Operate' (SLO) - the level of acceptance or approval by local communities and stakeholders of mining companies and their operations, also known as public acceptance and trust.
[8]http://eit.europa.eu/eit-community/eit-raw-materials
[9]https://ec.europa.eu/jrc/en/scientific-tool/raw-materials-information-system
[10]COM(2013)659 of 20.09.2013
[11]http://ec.europa.eu/growth/sectors/raw-materials/policy-strategy/index_en.htm
[12]https://ec.europa.eu/jrc/en/scientific-tool/raw-materials-information-system

Topic ID and title	SC5-16-2016-2017 – Raw materials international cooperation					
Status	Forthcoming	Opening date	08/11/2016	Deadline 1 Deadline 2	07/03/2017	
Type of action	CSA Coordination and Support action					
FTP subsector	Whole value-chain					
FTP SRA	1.3 Policies and good governance			FTP relevance	high	
					medium	
					low	

Specific Challenge:
Many countries are facing similar challenges in the field of mineral raw materials as the EU, including dependence on supply of raw material from international markets, shortage of knowledge on raw materials and their flows for decision making by authorities, industry, financial sector etc. Understanding of the global nature of raw materials value chains and ensuring sustainable supply of primary and secondary raw materials for the EU requires knowledge of materials flows at a global level and relevant skills. At present, there is a shortage of specialists in the EU in some areas related to primary and secondary raw materials production and raw materials markets. This is a challenge that needs to be addressed at the EU level together with the relevant countries around the world having expertise in the field. In addition, the global nature of raw materials value chains requires common approach and solutions at a global level in order to ensure fair and unrestricted access to raw materials worldwide. There is therefore a need for a more active involvement of the EU in relevant initiatives and closer collaboration with competent international organisations in the field of raw materials.

Scope:
Proposals should address **one** of the following:

a) Demand-supply forecast and raw materials flows at global level (2016): Proposals should develop a common methodology to mineral raw materials flows at global level which could be agreed and used at international level. As a pilot case, focus should be on critical raw materials and in particular the ones used in low-carbon technologies. The methodology should incorporate models on demand-supply forecast in order to allow for dynamic analysis of global materials flows. Proposals should provide recommendations and feed into future policy developments.

In line with the strategy for EU international cooperation in research and innovation (COM(2012)497), international co-operation is required with the US and Japan in the field of Materials Flow Analysis. Where appropriate, synergies with the relevant EU Member States initiatives are to be explored and fostered.

Proposals should build on the outcomes of the Study on Data Inventory for a Raw Material System Analysis and on related studies performed by the International Resource Panel.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

b) Advancing the idea of a World Forum on Raw Materials (2016): With a view to contributing to the fair and unrestricted access to raw materials worldwide, this action should cover all the following points:

- develop an EU-based platform of international key experts and stakeholders that would advance the idea of a World Forum on Raw Materials and enhance the international cooperation among G20 Member countries as well as the other third countries active in the mining and other raw materials sectors;
- foster sharing of experience with a view to increasing understanding of all aspects of trade in raw materials and strategies to leverage natural resources for wider growth and development in close co-operation with the OECD to contribute to the OECD policy dialogue;
- where appropriate explore and foster synergies with the relevant EU Member States initiatives;
- identify common needs and threats, and develop and promote on international fora recommendations on possible actions to consolidate the efforts of the countries involved towards a more joint and coherent approach towards raw materials policy and investment;
- involve relevant organisations, in particular OECD, International Study Groups, CONNEX, the Intergovernmental Forum on Mining, UNEP Resource Panel, in the planned activities.

In line with the strategy for EU international co-operation in research and innovation (COM(2012)497), international co-operation is required, in particular with G20 Member countries as well as the other third countries active in the mining and other raw materials sectors, and international organisations.
The Commission considers that proposals requesting a contribution from the EU of up to EUR 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

c) International network of raw materials training centres (2017): Proposals should create a self-sustainable long-term lasting international network of training centres for professionals. The proposals should involve educational and research institutions in the EU and the leading counterparts in third countries, based on specific country expertise in the primary and secondary raw materials sectors. The network should map skills and knowledge in the EU and the third countries, identify key knowledge gaps and emerging needs, develop roadmap for improving skills and knowledge, as well as establish common training programmes in the raw materials sectors.

In line with the EU's strategy for international co-operation in research and innovation (COM(2012)497), international collaboration is required. Where appropriate, synergies with the relevant EU Member States initiatives are to be explored and fostered.

The Commission considers that proposals requesting a contribution from the EU of up to EUR 1 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
The project is expected to contribute to:
a)

- implementation of the Raw Materials Initiative[1] and achieving the objectives of the EIP on Raw Materials, in particular in terms of establishing and maintaining strong and sustainable relationships with the countries concerned, in particular with Japan and US;
- better informed decision-making by authorities and companies at the EU and global levels;
- better understanding of global raw materials flows and market trends;

b)

- implementation of the Raw Materials Initiative and achieving the objectives of the EIP on Raw Materials, in particular in terms of establishing and maintaining strong and sustainable relationships with the relevant international organisations and countries;

- fair and unrestricted access to raw materials worldwide;
- economic stability in the raw materials supply at a global level;
- better informed decision-making at EU and global levels;

c)

- implementation of the Raw Materials Initiative and achieving the objectives of the EIP on Raw Materials, in particular in terms of establishing and maintaining strong and sustainable relationships with the leading training institutions in the relevant countries;
- increasing the EU competence and expertise in the field of the primary and secondary raw materials;
- improved availability of qualified and skilled workforce leading to higher competitiveness of the EU raw materials industry;
- enhancing the possibility for new cross-sectorial innovations.

Cross-cutting Priorities:
International cooperation

[1]http://ec.europa.eu/growth/sectors/raw-materials/policy-strategy/index_en.htm

Topic ID and title	SC5-32-2017 – Biodiversity scenarios					
Status	Forthcoming	Opening date	08/11/2016	Deadline 1 Deadline 2	07/03/2017	
Type of action	ERA-NET-Cofund					
FTP subsector	Forestry					
FTP SRA	2.2 Ecology and ecosystems services			FTP relevance	high	
					medium	
					low	

Specific Challenge:
Evaluating and improving the sustainability of the management of biodiversity and ecosystem services is a major challenge of our time all over the world. Scenarios of biodiversity and ecosystem services have been a key component of forward-looking decision making as they contribute to i) better understanding and synthesizing a broad range of observations, ii) informing decision makers about future impacts of global changes such as climate change, land use change, resource overuse, invasive alien species or pollution, iii) providing decision support by developing adaptive management strategies, and iv) evaluating the implications of alternative social-economic development pathways and policy options.

Development of scenarios for biodiversity and ecosystem services, based on the understanding and modelling of their dynamics and the evaluation and reanalysis of past changes, is beginning to receive high priority in the research policy of the majority of countries worldwide. In this context, aligning research agendas and implementing them through international calls will promote synergies and optimal use of the available expertise and resources, avoiding duplication and ensuring robust outcomes of global relevance. To attain this, BiodivERsA is opening to third country partners and the Belmont Forum provides an excellent platform for international collaboration.

Scope:
Proposals should pool the necessary financial resources from the participating national (and as needed local and regional) research programmes with a view to implementing a joint call for proposals with EU co-funding resulting in grants to third parties. The proposal should include other joint and follow-up activities, including possibly additional joint call(s) without EU co-funding. The proposal should demonstrate that these co-funded other activities exclude any overlaps with ongoing actions of this ERA-NET co-funded by the EC. Actions should build on the strategic roadmap of BiodivERsA ERA-NET Cofund and launch at least one international call on biodiversity and ecosystem services scenarios in collaboration with the Belmont Forum specifically to promote trans-continental collaboration. Cooperation and coordination with other ERA-NETs and/or JPIs to increase synergies on cross-cutting issues, where appropriate, is encouraged.

Participation of legal entities from international partner countries and/or regions, particularly from countries participating in the Belmont Forum, is encouraged in the joint call as well as in other joint activities without EU co-funding. For the co-ordination costs of additional activities only, participants from countries which are not automatically eligible for funding[1] may nonetheless request a Union contribution (on the basis of the ERA-NET unit cost).

The Commission considers that proposals requesting a contribution from the EU in the range of EUR 7 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:
Actions are expected to lead to:

- the alignment of research and innovation agendas in the area of scenario development for biodiversity and ecosystem services and co-ordinated streamlining of the implementation of at least one call;
- enhanced excellence and global relevance of research and innovation activities on biodiversity and ecosystem services, improving the relevance and value of advances made in developing socio-economic scenarios and models of global change impacts on the dynamics of biodiversity and ecosystem services for decision makers at multiple scales;
- increased visibility of European biodiversity scientific community and research outcomes at international level;
- strong and lasting alliance with the funding agencies of key international partners for research and innovation actions on biodiversity and ecosystem services (e.g Brazil, China, India, Japan, Mexico, South Africa, USA);
- link with possible assessments as those conducted, e.g., by the IPBES to induce a wider, worldwide and regional use of scenarios to better assess future, plausible trends of biodiversity and ecosystem services and explore the role that nature-based solutions may play;
- contribution to the implementation of the Sustainable Development Goals (SDGs), in particular SDG 15 'Protection, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'.

Cross-cutting Priorities:
ERA-NET
International cooperation
Socio-economic science and humanities

[1]http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/international-cooperation_en.htm