#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

Infoday on 2020 Partnership Calls

Porto – 25 November 2019

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Research and Innovation

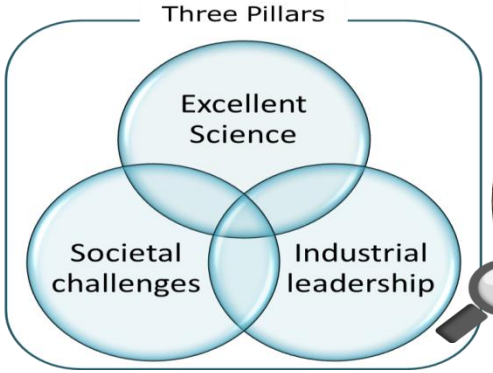
Strategic Context: Importance of EU Manufacturing

- **64% of private R&D investment**
- **2.1 million enterprises (9% of total)**
- **36** million jobs + many indirect jobs via related services
- **Biggest purchaser & user of KETs**: huge potential for innovation

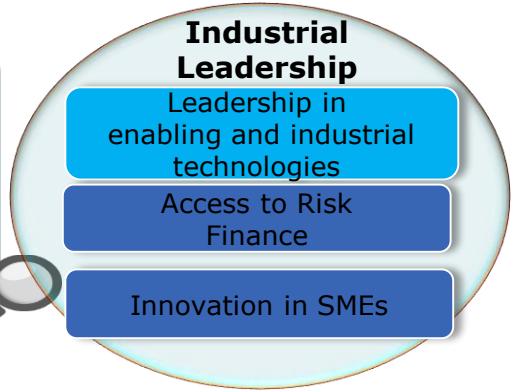
But

- **Low private R&D investment** compared to international partners – 1.4%
- Third largest contributor of **GHG emissions**
- Dependence on imported raw materials and technologies

NMBP in Horizon 2020

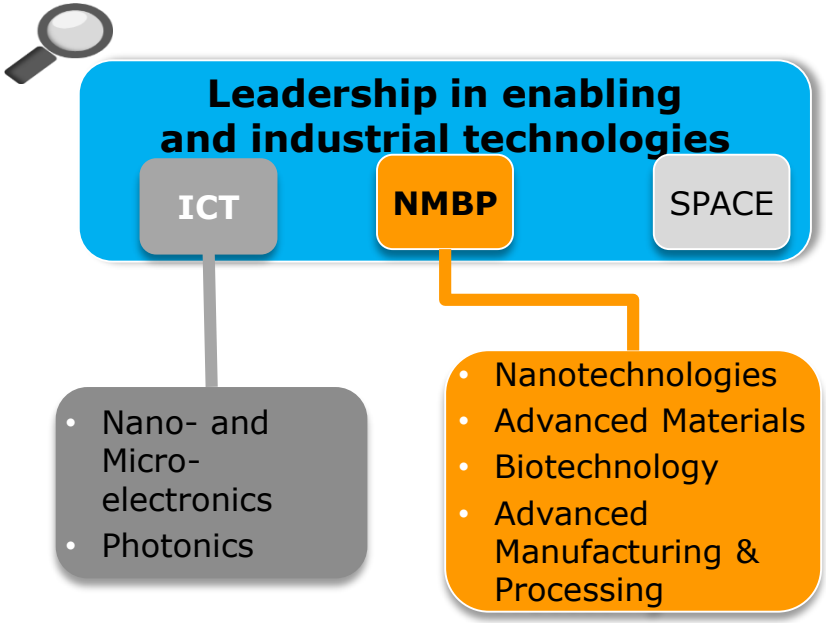


Indicative budget:
75 billion € *



Indicative Budget:
16.5 billion € *

Out of it for NMBP:
3.8 billion € *



* July 2015 – includes EIT, JRC, "Science with and for Society", "Spreading Excellence / Widening Participation", in addition to three priorities above

European Commission

Expected Impact

- **Technological ambitions**, including goals for environmental sustainability, cost reduction, human aspects etc. (see topic descriptions)
- **Take-up of results for industrialisation/commercialisation, including upscaling, investments, addressing different markets**

=> *business cases and exploitation strategies for industrialisation*

- Building **new test/experimentation/validation infrastructure and services** (for SMEs)
- Reach out to **newcomers** (e.g. SMEs) and **civil society**; dissemination goals

Proposal evaluation

Excellence & Impact criteria equally important

Higher weighting for impact for Innovation Actions!

European Commission

Public-Private Partnerships in Horizon 2020

Institutionalised PPPs	Contractual PPPs
• Innovative Medicines (IMI) • Clean Sky • Single European Sky ATM Research (SESAR) • Fuel Cells and Hydrogen (FCH) • Electronic Components and Systems (ECSEL - old ARTEMIS + ENIAC) • Bio-based Industries (BBI) • Shift2Rail	• **Factories of the Future (FoF)** • **Energy-efficient Buildings (EeB)** • **Sustainable Process Industry (SPIRE)** • **Green Vehicles (EGVI)** • **Future internet (5G)** • **Robotics** • **Photonics** • **High Performance Computing** • **Big Data** • **Cyber-Security**

European Commission

What is the FoF Contractual Public-Private Partnership?

- **Industry** plays **leading role** in defining research priorities
- **Pre-defined budget** ensures continuity and commitment
- Focus is on **enabling industrial technologies**
- **SME-friendly**
- Concrete objectives
- Using fully open H2020 calls
- Industry **commitment** for leverage and further investments

European Commission

FOF-07-2020 – Assembly of micro parts

Specific challenge

- Investments in R&D of **new micro-manufacturing techniques** are necessary to maintain European manufacturing advantage
- Manufacturing technologies used for larger parts cannot be directly applied to micro part assembly because of physical phenomena.
- European industry has technology to produce & assemble micro-scale objects (total volume < 1 mm3 & dimensions between 10µm and 300µm)
- Further efforts needed to **combine accuracy, speed, productivity, efficiency and reliability**
- New **production lines** must be able to detect & adapt with minimum human involvement to variations in the environment or the components
- **Models of micro systems assembly processes** are needed that take these effects into account

European Commission

FOF-07-2020 – Assembly of micro parts

RIA 100%

TRL 4-6

Scope

Focus: **new assembly technologies** (e.g. additive manufacturing) especially for products that contain micro-parts and which are assembled manually because of technical limitations

Proposals to cover **min. 3 of the following areas**:

- **Design for micro-assembly & micro-disassembly** including procedures, standardisation & performance
- **High throughput systems for micro-handling & assembly** (including robust strategies to grasp & release parts)
- **In-line monitoring & quality assessment** for parts & assembly
- **Closed-loop error** compensation & optimisation models & algorithms adaptable to specific working conditions
- **Advanced control methods** and/or human-in-the-loop strategies

Proposals to include pilots where industrial end-users will validate demonstrated processes. Proposed solutions to respect environment & workers, economically viable & easily transferable to other sectors or product types.

European Commission

EUR 8-10 million

***Open**: 27 June 2019*
***Close**: 5 Feb 2020*

FOF-07-2020 – Assembly of micro parts

Expected impact

The developed manufacturing process should deliver all of the following:

- A **decrease of production time** by at least 15%
- A measurable increase of automation levels, especially the self-adaptation to changes, e.g. machine learning
- A **higher or similar precision** level
- A **reduction of at least 20% in rejection rates** during the production process

Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

FOF-09-2020 – Energy-efficient manufacturing system management

Specific challenge

- Improving **industrial energy efficiency** requires **the integration of energy data** (historical data, real-time data and real-time predicted energy cost) into **complex production management systems**.

- The challenge is **to combine energy efficiency technologies** into a holistic, intelligent and interoperable approach to **ensure comprehensive implementation** that provides significant energy savings.

European Commission

FOF-09-2020 – Energy-efficient manufacturing system management

IA 70%

TRL 5-7

Scope

Near real-time intelligent, transparent management of production systems can improve traditional LCA/LCCA approaches towards more ambitious energy saving.

Proposals are expected to address **all of the following**:

- Application of ICT (e.g. **digital twins, big data, IoT, cloud technologies & AI**) allowing a shift **from diagnosis to prognosis** of energy consumption & cost in manufacturing
- Info collection & compilation linking the **environmental footprint** of each equipment/component to the complete factory/plant & entire value chains
- Demonstration of design approaches & technologies, through min. 2 complex **industrial case studies**, with application focus across manufacturing sectors
- **Certification/standardisation** of proposed solutions with focus on compatibility of energy/environmental data across manufacturing sectors

European Commission

EUR 8-10 million

***Open**: 27 June 2019*
***Close**: 5 Feb 2020*

FOF-09-2020 – Energy-efficient manufacturing system management

Expected impact

- **Energy consumption reduction** for improved production processes at least 25%
- **Life Cycle Cost reduction** of at least 15%
- **Improved environmental performance** of the involved products
- Development of **standardised European energy-efficient best practices** to overcome the barriers limiting their application in the manufacturing sectors

Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal

European Commission

FOF-10-2020 – Pilot lines for large-part high-precision manufacturing

Specific challenge

- Production of **large-scale parts** displays **low level of mechanisation & automation** due to need for non-standard machines & design procedures
- **Repair of large parts** is difficult, causing problems in quality & repeatability
- A more **automated production & in-situ repair** is needed for large innovative & multi-functional products
- Recent research in the large-scale parts production has delivered **high-quality demonstrators**
- Full-scale, **reconfigurable, modular and flexible pilot lines**, are needed to accommodate processing, e.g. for thermal treatment, control & characterisation

European Commission

FOF-10-2020 – Pilot lines for large-part high-precision manufacturing

IA 50%

TRL 5-7

Scope

Proposals to **cover min. 3 of the following & to demonstrate** them in relevant industrial environments:

- **Upgrading manufacturing equipment** using several innovative steps for high precision manufacturing in an integrated & modular process
- **Implement design, modelling & simulation tools** to support the selection of processing parameters
- **New methods & instruments** for process characterisation & in-line control of large-scale parts (for quality & high precision, e.g. non-destructive testing)
- **Work-holding devices** reducing repositioning of components, as well as new methods for equipment calibration & in-process fast recalibration

Provide open access to pilot lines for training purposes

European Commission

EUR 12-15 million

***Open**: 27 June 2019*
***Close**: 5 Feb 2020*

FOF-10-2020 – Pilot lines for large-part high-precision manufacturing

Expected impact

The developed manufacturing process should deliver **all** of the following:

- **Reduction of production cost** by at least 15% through process integration, flexibility of the production cells, improved quality and reduction of assembly costs
- **Reduction of production time** by at least 20% by a significant automation increase
- A **higher or similar precision level**
- **Reduction of the scrap** generated by the process by at least 20%
- **Reduction of the environmental impact and of safety hazards**

Relevant indicators & metrics, with baseline values, should be clearly stated in the proposal

European Commission

FOF-11-2020 – Quality control in smart manufacturing

Specific challenge

- Smart factories are characterised by processes involving **interlinked work pieces** & associated tools as well as **logistics** operations
- They generate **large amounts of data**, which can be used for analysis and prediction as well as to **optimise the quality** of manufacturing operations and manufactured products
- A major challenge for manufacturing is the **reliability of data**

Research and Innovation

European Commission

FOF-11-2020 – Quality control in smart manufacturing

IA 70%

TRL 5-7

Scope

Measurement traceability should ensure optimal manufacturing quality. Suitable modelling & simulation approaches & data fusion techniques are needed to interpret & use sensor/actuator data in a factory.

Proposals to **address min. 3 of the following aspects**:

- **Integrate** intelligent, cognitive, adaptive & cost-effective instruments & **systems of sensors/actuators** for process monitoring & control (e.g. virtual sensors and digital twins) **into existing production or pilot lines**
- **Showcase real-time data validation** within an actual production line & **incorporate data integrity strategies** based on, e.g., distributed ledger (blockchain) technology
- **Demonstrate** how distributed, time stamped & persistent solutions for automated collection, storage, analysis & use of production data can lead to **an integrated approach to zero-defect manufacturing**
- Develop **strategies for rapid line qualification & reconfiguration** based on large pre-existing data sets & related open protocols

Certification, regulatory & standardisation activities related to the proposed solutions should be included in the proposal.

European Commission

EUR 8-10 million

***Open**: 27 June 2019*
***Close**: 5 Feb 2020*

FOF-11-2020 – Quality control in smart manufacturing

Expected impact

- **Increased equipment productivity** through rapid error localisation (10%)
- **Reduction of ramp-up time** (> 15 %) using smart sensors/actuators & existing production data sets
- AI-driven instrumentation stimulating the **transformation towards smart & fast processes** leading to decreased time-to-market (time reduction >10%)
- Significant **increase in quality** of manufactured products leading to a **reduction of scrap** of at least 50%

Relevant indicators & metrics, with baseline values, should be stated clearly in the proposal

European Commission

Sustainable Process Industry through Resource and Energy Efficiency (SPIRE)

- Partnership covers **8 EU industrial sectors**, representing around 6.8 million jobs in 450,000 enterprises.
- Main objectives:
- A **reduction in fossil energy intensity** of up to 30% by 2020
- Efficiency **improvement of CO2-equivalent footprints** of up to 40%
- Major integration of industrial processes through **Industrial Symbiosis**
- A **reduction in non-renewable, primary raw material intensity** of up to 20%
- All SPIRE funded projects: https://www.spire2030.eu/projects/our-spire-projects

European Commission

CE-SPIRE-01-2020: Tapping into the potential of Industrial Symbiosis

Specific Challenge

- Industrial Symbiosis holds significant potential to provide:
- Major improvements in resource and energy efficiency for all energy intensive industries
- Accelerate the transition to a circular economy and to renewable energy systems, reduce waste heat energy and lead to significant reduction of GHG emissions
- **Challenge: Industrial Symbiosis is currently not yet widely implemented**
- **Need to tackle technological and non-technological barriers to harness its full potential**
- Energy grids and adjacent infrastructures as well as the local and regional dimension are all critical factor which must be taken into account

European Commission

CE-SPIRE-01-2020: Tapping into the potential of Industrial Symbiosis

Scope

- **Demonstrate novel symbiotic value chain involving multiple industrial sectors in real industrial settings**
- Proposals are expected to address:
- **Broader symbiosis with infrastructures communities** and energy grids, including the role that IS can play in fluctuating energy grids
- **Management of side/waste streams** specifically for the use as resource for other plants and companies across sectors and/or across value chains
- Process (re-)design and implementation to integrate and adapt existing processes to enhance industrial symbiosis
- Integration of information technology (e.g. AI) for multi-criteria decision making, the design and management of IS in a dynamic production environment. Considering data sharing and preservation of data confidentiality

European Commission

CE-SPIRE-01-2020: Tapping into the potential of Industrial Symbiosis

TRL from 6 to 7

Scope

- **Assessment methodologies and KPIs to measure the performance of symbiosis**, including environmental, economic and social impacts, LCA, LCC, LCSA taking into account existing sustainability standards (e.g. ISO 10410) and existing best practices
- Consider Non-technological aspects (e.g. regulatory issues, standards, and new business models) covering ownership, management and fair sharing of benefits
- Clustering and cooperation with other selected projects under this cross-cutting call is strongly encouraged

European Commission

CE-SPIRE-01-2020: Tapping into the potential of Industrial Symbiosis

EUR (12-20 millions)

Expected Impact:

- Step change towards closing circular loops;
- **Improvement of at least 15% in energy efficiency** of the targeted industrial processes, compared to the non-symbiotic scenario;
- **Reduction of at least 30% in total energy intensity**, on the basis of full life cycle considerations;
- **Overall reductions in CO2 emissions of 40%** compared to the non-symbiotic scenario;
- **Reduction in primary raw material intensity of up to 20%**;
- **Reduction of waste generation by at least 25%**;
- Better understanding of relevant barriers (e.g. end of waste criteria);
- The environmental gains in absolute figures, and weighted against EU and global environmental footprints, should be demonstrated;
- In addition, the replication potential should also be be assessed.

CE-SPIRE-07-2020: Preserving fresh water: recycling industrial waters industry

Specific Challenge

- Energy-intensive industries are major users of fresh water, for e.g. processing, washing, diluting, heating, cooling, and transporting products
- Since fresh water is a scare resource, **breakthrough innovations are needed in energy-intensive industries to recycle water and create closed loops in industrial processes and reduce the use of fresh water**
- Industrial symbiosis offers the potential for energy, water and other resource efficiency at a scale beyond energy intensive industries.

CE-SPIRE-07-2020: Preserving fresh water: recycling industrial waters industry

Scope

Proposals should aim at **near-zero discharge using closed-loop systems** in combination with recovery of energy and/or substances (resources) through the development of integrated water-smart strategies for industrial processes

Strategies should take into account:

- **Better characterization of water usage and production** in the industrial processes.
- **Defining recycling options with a combined water, waste and energy approach** in an integrative system design method considering investment and optimal operations.
- **Reduce water demand** through design, control options, and technologies integration that reduce water consumption, recycle water, and reduce the use of fresh water (e.g. cascading use of different kinds of water in industrial settlements or for compatible re-use in urban and rural areas).

CE-SPIRE-07-2020: Preserving fresh water: recycling industrial waters industry

TRL from 5 to 7

Scope

Proposals should develop new technologies and approaches at a large scale, considering:

- Real time smart monitoring and management systems with innovative digital solutions for sensors and actuators.
- **Recovery technologies** such as highly selective separation and extraction processes. and new solutions for water treatment to prevent fouling and corrosion.
- **Integrated Water Management** should consider different qualities and sources of water
- scale-up testing to robust industrial processes will be required.
- Clustering and cooperation with other selected projects under this cross-cutting call, and with other relevant projects, SC5-04-2019 “Building a water-smart economy and society”, is strongly encouraged.

CE-SPIRE-07-2020: Preserving fresh water: recycling industrial waters industry

EUR (8-12 millions)

Expected Impact:

- **Significant reduction of the current use of fresh water resources**
- **Significant steps towards near-zero discharge** using closed-loop systems in industrial processes
- **Significant increase of the recovery of water, energy and/or substances and materials**
- **Increase of resource and water efficiency by 30%** compared to the state-of-the-art
- The environmental gains in absolute figures, and weighted against EU and global environmental footprints, should be demonstrated
- In addition, the replication potential should also be assessed
- Relevant indicators and metrics, with baseline values, should be stated clearly in the proposal

European Commission

CE-SPIRE-09-2020: Alternative mineral resources for high volume production

Specific Challenge

- Energy intensive industries in Europe depend on the one hand on very large volumes of minerals and other raw materials (e.g. 70% of process manufacturing depends on minerals and metals). On the other hand, they heavily rely on imports from third countries (extraction in Europe covers only 29% of the demand). The environmental footprint of high-volume products is also too high.
- **Develop technologies for the uptake of secondary raw materials based on industrial symbiosis, waste collection, or water treatment systems, and leading to new value chains or even value loops** (i.e. reusing waste, by-products and recycled materials repeatedly).
- Such new technologies should enable overcoming barriers such as low costs of primary raw materials or differences in taxes across countries and regions (e.g. landfilling taxes for primary and secondary raw materials).

CE-SPIRE-09-2020: Alternative mineral resources for high volume production

Scope

- **Development of new high volume value loops and integrated supply chains through industrial processes enabling the cross-sectoral, symbiotic, use of mineral waste, by-products and end-of-life materials from other industry sectors**
- Secondary materials can be used either as raw material for the production process introduced in a subsequent process step to an intermediate product where they become a constituent of the final product.
- Composition variability of wastes or by-products can be addressed either by purification processes prior to production, or within the production process.
- The following aspects should also be considered:
- Product specifications compliance (e.g. durability, versatility, quality, traceability), clearly shown by involving relevant actors in the value chain.
- Economic viability of the proposed processes together with potential new business concepts and simplified methodologies.

CE-SPIRE-09-2020: Alternative mineral resources for high volume production

TRL from 5 to 7

Scope

- Regulatory aspects such as transport and use of secondary material in new products put on the market
- Information guides should be provided before the end of the project.
- **Proof of concept should be delivered at pilot or demo scale** (excluding commercially usable prototypes) to demonstrate convincingly scalability towards industrial applications. Projects are encouraged to develop advanced modelling tools or to use them to build dedicated pilot installations.
- Clustering and cooperation with other selected projects under this cross-cutting call and other relevant projects is strongly encouraged.

CE-SPIRE-09-2020: Alternative mineral resources for high volume production

EUR (8-12 millions)

Expected Impact

- **Reduction potential of at least 30% of primary raw material use** per ton of main (high volume) final product
- **Reduction of waste generation by at least 25%**
- **Significant energy savings and reductions in CO2 emissions** (including through a higher share of renewable energy) in the overall production lines
- Secure and sustainable provision of secondary resources at total cost lower than existing solutions
- Contribution to new standards for the use of secondary materials for new products
- The environmental gains in absolute figures, and weighted against EU and global environmental footprints, should be demonstrated
- In addition, the replication potential should also be assessed

European Commission

Cross-Cutting Call: *Competitive, Low Carbon and Circular Industries (Section 20. Cross-cutting activities)*

Portfolio rationale: Design and demonstration of

- profitable and sustainable (circular) value chains of materials, products and services;
- novel sourcing and value-added destinations for non-product outputs between industrial facilities (industrial symbiosis)

Portfolio approach: clustering activities

- continuous dialogue and exchange of good practices between all actors involved
- transfer of knowledge and to identify technological and non-technological barriers.
- coordinated deliverables and joint dissemination or exploitation activities

		Budgets
NMBP		
1.	NMBP - ERA-NET on materials, supporting the circular economy and Sustainable-Development-Goals	**118.5 M€**
2.	NMBP - Materials life cycle sustainability analysis (RIA)	
3.	SPIRE - Tapping into the potential of Industrial Symbiosis (IA)	
4.	SPIRE - Preserving fresh water: recycling industrial waters industry (IA)	
5.	SPIRE - Alternative mineral resources for high volume production (IA)	
SC5		
6.	Develop, implement and assess a circular economy oriented product information management system for complex products from cradle to cradle (IA)	**58 M€**
7.	Raw materials innovation for the circular economy (IA): processing and refining of primary and/or secondary raw materials; recycling of raw materials from end-of-life products & buildings; advanced sorting systems for high-performance recycling of complex end-of-life products, sustainable metallurgical processes	
8.	Raw materials policy support actions for the circular economy: Expert network on Critical Raw Materials (CSA)	
SC3		
9.	Low carbon industrial production using CCUS (IA)	**29 M€**
10.	Industrial (Waste) Heat-to-Power conversion (IA)	

European Commission

Topics (Type of Action)	Budgets (EUR million)	Deadlines
	2020	
Opening: 02 July 2019		
CE-NMBP-41-2020 (ERA-NET-Cofund)	15.00	05 Feb 2020
CE-NMBP-42-2020 (RIA)	6.00	
CE-SC5-08-2020 (CSA)	3.00	
CE-SPIRE-01-2020 (IA) **CE-SPIRE-07-2020 (IA)** **CE-SPIRE-09-2020 (IA)**	97.50	
CE-SC5-07-2020 (IA)	40.00	05 Feb 2020 (First Stage) 03 Sep 2020 (Second Stage)
CE-SC5-31-2020 (IA)	15.00	
Opening: 05 May 2020		
LC-SC3-CC-9-2020 (IA)	14.00	01 Sep 2020
LC-SC3-NZE-5-2020 (IA)	15.00	
Overall indicative budget	205.50	

European Commission

Energy Efficient Buildings (EEB)

- **Buildings responsible for 40% of the energy use and 36% of the CO_2 emissions** in EU
- To comply with Paris Agreement obligation **vast changes required in a short time span**
- The challenge is to develop further, demonstrate and validate key breakthrough technologies for energy efficient buildings and districts
- European added value from decarbonising the EU building stock and developing affordable and integrated energy storage solutions

Research and Innovation

European Commission

LC-EEB-04-2020: Industrialization of building envelope kits for the renovation market (IA)

Specific Challenge

Despite the wide range of products dedicated to insulation, energy supply and comfort available on the market, affordable, ready-to-go, all-in-one, **tailor-made reliable solutions directed to deep renovation of existing residential buildings are missing**

Research and Innovation is necessary for an all-inclusive envelope of industrialised solutions addressing deep renovation of buildings that are sufficiently flexible and customisable to address significant market segments in EU reaching Near Zero-Energy Building (NZEB) standards

European Commission

LC-EEB-04-2020: Industrialization of building envelope kits for the renovation market (IA)

Scope

Proposals should include at least the following elements:

- **Develop plug & build smart components and modules with specific connecting and controlling parts**
- **Decision support tools for the selection of the refurbishment solution** based on LCA/LCC
- **Adaptable and scalable Building Management Systems (BMS)**
- Case modelling applications, analysis prior to installations, guide for installers and support for decommissioning
- Solid plan for industrial uptake at a large scale, meeting eco-construction and eco-production standards
- Retrofit the whole envelope of two to three real scale residential buildings in different climate zones plus at least three virtual demos of the plug & play elements

European Commission

Topic LC-EEB-04-2020: Industrialization of building envelope kits for the renovation market (IA)

Expected impact

- **Demonstrate retrofitting plug & build solutions and tools** reaching NZEB standards suitable for mass production by industry for buildings under deep renovation;
- **Decrease of retrofitting time and costs by at least 50%** compared to current renovation process for the same building type;
- **Improve Life Cycle Assessment (LCA) standards**;
- **Accelerate the renovation process** by enabling access to better products.

TRL: 5-7

Type of Action: Innovation Action

Budget: 6-8M €

#H2020Energy

Research and Innovation

Topic LC-EEB-07-2020: Smart Operation of Proactive Residential Buildings (IA)

Specific Challenge

- **Building energy management** and demand for a new solution
- **Smart operation of proactive buildings** based on innovative components, accurate energy performance predictions, control technologies, predictive maintenance and data supply for the customer
- Future energy management and contracting **turning a building from reactivity into proactivity**. A building should be able to control a situation rather than just responding to it
- Buildings should act in advance and **ensure interoperability between grid components and Building Energy Management Systems**
- Customer experiences should be simple, smooth and delightful

LC-EEB-07-2020: Smart Operation of Proactive Residential Buildings (IA)

Scope

Proposals should include at least the following elements

- **Develop, test and promote the necessary technologies, devices and systems for a smart approach of energy management** in line with the latest reforms of the EPBD
- **Develop solutions for proactive buildings**, which should be safe, healthy (strengthening of the indoor environment quality requirements) and energy-efficient
- **Develop solutions to provide the pivotal parameters to be measured and controlled** for integrated and demand-based control of the building service system. Self-management, self-monitoring, self-healing and self-optimisation will be required
- Utilise **a systematic, standardised approach to process the data generated by the sensors, forecasting services and end-users**
- **Tackle utilisation of big data** by advanced data visualisation to optimise the operation of the building
- Ensure that **fully integrated systems have the capacity to be compact, easy to commission and to operate, exchangeable and easy to interact with the grid**
- **Implement and demonstrate new business models** providing services that enable buildings to be proactive

Topic LC-EEB-07-2020: Smart Operation of Proactive Residential Buildings (IA)

Expected impact

- **Maintenance cost reductions of at least 20%**
- **Significant decrease of energy use in buildings** through application of technologies such as dynamic models, big data analytics, predictive analytics and ultimately artificial intelligence
- Improved indoor environment quality and user satisfaction
- High replication potential
- Optimise the use of renewable energy resources used in buildings
- Contribution to standards, namely the establishment of a Smart Readiness Indicator.

TRL: 5-7

Type of Action: Innovation Action

Budget: 6-8M €

Topic LC-EEB-08-2020: Digital Building Twins (RIA)

Specific Challenge

- **Go beyond the data provided through BIM**
- Facilitate monitoring of activities and comparison of relevant data against the initially agreed planning
- **Answer to the lack of open semantic interoperability standards between actual BIM and future BIM**

Topic LC-EEB-08-2020: Digital Building Twins (RIA)

Scope

Proposals should include at least the following elements:

- **Automated progress monitoring** allowing verification that completed work is consistent with plans and specifications
- **Tracking of daily changes in an as-build model**, allowing early detection of discrepancies
- **Avoiding over-allocation of resources by dynamic prediction of requirements**, thus reducing the need to move resources over long distances and improving time management
- **Assuring safety of workers** by a system of early detection and notification by applying artificial intelligence
- **Quality assessment by image processing technologies** should allow verification of structure conditions and detection of cracks or material displacement, triggering additional inspections
- **Optimisation of equipment usage** by advanced imaging and automatic tracking

Topic LC-EEB-08-2020: Digital Building Twins (RIA)

Expected impact

- **Better scheduling forecast by 20%**
- **Proposals for a future standardisation for Digital Twins at a European scale**
- Better allocation of resources and optimization of equipment usage
- Reduced number of accidents on construction sites
- **Reduction of costs on constructions projects by 20%**

TRL: 4-6

Type of Action: Research & Innovation Action

Budget: 5-6M €

Topic NMBP-36-2020: Monitoring and safety of transport infrastructures (CSA)

Specific Challenge

- **Too many collapses of aging road bridges in Europe** (built more than 40 to 50 years ago)
- **Need of sound procedures to ensure efficient monitoring, quality control and preventive maintenance** of construction activities (including materials)
- Bridges are in particular sensitive infrastructures subject to volumes of traffic greater than originally designed for. Including Ten-T!
- Action proposed to analyse relevant procedures and examine new technologies for optimising monitoring/ control of bridges
- Identify concrete needs for an harmonized approach, including where possible for other infrastructures (e.g. tunnels)

Topic NMBP-36-2020: Monitoring and safety of transport infrastructures (CSA)

Scope

Proposals should include at least the following elements:

- **Critical review of existing procedures across EU**
- Analysis of advanced technologies, procedures, methodologies and standards to monitor and control safety and smooth operation of aging bridges
- State of the art for damage detection technologies and methods for assessment of performances
- Barriers (technical, economic, environmental, social, administrative), which hinder the safe operation/ maintenance of bridges
- **Identify efficient ways to reflect deviations from design specs in maintenance programmes** (more frequent use, higher loads, climate change, extended life)
- **A roadmap for adoption of technologies to measure predicted durability** of materials, components and overall reliability of existing assets
- The technical input for a future EU standard and guidance material
- Develop networks with relevant stakeholders (e.g. authorities, industry, academia, etc.) to share findings

Topic NMBP-36-2020: Monitoring and safety of transport infrastructures (CSA)

Expected impact

- **Support the preparation of a mandate for a standard** (CEN TC 250) for the maintenance and control of large infrastructures.
- **Best practices for monitoring the safety of bridges** and other relevant infrastructures
- **Significant improvement of the safety of bridges** and other relevant transport infrastructure through improved maintenance and control

Type of Action: Coordination and Support Action (CSA)

Budget: 2M €

European Commission

Where to get advice and support ?

National Contact Points in your country http://europa.eu/!ub88vC (NMP)

National Contact Points Project website - webinars, presentations, guidance:
http://www.nmpteam.eu/

Research Enquiry Service: http://ec.europa.eu/research/index.cfm?pg=enquiries

Further information

Horizon 2020: http://ec.europa.eu/research/horizon2020/index_en.cfm

Key Enabling Technologies, R&I website : http://ec.europa.eu/research/industrial_technologies/index_en.cfm

Participant Portal - Funding Opportunities and support services :
http://ec.europa.eu/research/participants/portal/desktop/en/home.html

CORDIS database with EU funded research projects : http://cordis.europa.eu/projects/home_en.html

Twitter : @EU_H2020 - #H2020 - @EUScienceInnov - #EUIndustryDay - #InvestEUResearch

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Thank you!

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