



European Partnerships

#HorizonEU

Strategic coordinating process for Partnerships:
Structured consultation of Member States

Research and Innovation



Context – strategic coordinating process

1.12.2017: Council Conclusions calls on COM and MS to jointly establish a long-term strategic coordinating process

17.05.2018: ERAC recommendations on the requirements for the set-up of a strategic coordinating process, importantly:

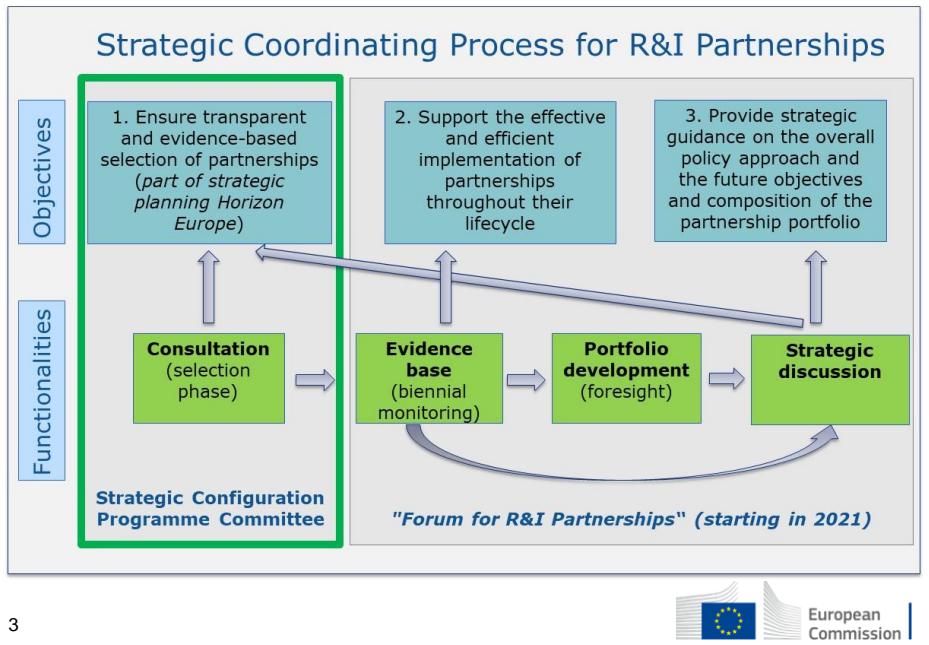
*"The strategic coordinating process should function as an **entry point** for setting up new R&I partnerships. It can only be of advisory character providing qualitative input, **without duplicating and circumventing any existing decision making processes at EU and national level, namely the Commissions' right of initiative, comitology or funding decisions at national level.**"*

Horizon Europe Regulation (common understanding): general provisions for establishing European Partnerships (recitals, Article 8) and criteria (Annex III) + areas for A187/5 Partnerships (Annex Va)

Specific Programme (PGA): Partnerships and the Strategic Plan (Article 4a):

"The strategic planning process shall be complemented by a strategic coordinating process for European Partnerships, with participation of Member States and the Commission on equal footing. It shall function as an entry point for foresight analysis, analysis and advice on the portfolio development, possible setup, implementation, monitoring and phasing out of R&I partnerships and be guided by a comprehensive criteria framework, based on Annex III of the Horizon Europe Regulation."

Context



Structured MS consultation - process and timeline

3 May 2019: Roadshow in the shadow Strategic Configuration PC, with an overview on all candidates for European Partnerships identified so far, and short presentations/discussion on those potentially based on Article 185/187;

→ **Overview table and slides have been submitted in advance**

→ **Feedback from MS on 3 May will inform the draft Inception Impact Assessments**

May 2019:

- Submission of detailed fiches for candidates of European Partnerships to the shadow SPC (week of 6 May);
- Launch of the MS written consultation via shadow SPC;
→ **deadline for submission 28 May;**
- Publication of Inception Impact Assessments.

June 2019:

- Analysis of feedback by RTD.A and supported by services in charge of the respective candidates, critical points for discussion with Shadow SPC identified;
- Submission of summary report to shadow SPC prior to meeting;
- 27 June: meeting in the shadow SPC with a dedicated point on European Partnerships to **discuss key issues identified**.

Rationalisation and reform

ERAC recommendations 6 December 2018: "ERAC calls on the Commission and Member States / Associated Countries to jointly apply the identified rationalisation strategies, so that from the beginning of the next Framework Programme onwards, fewer, more coherent and strategic R&I partnerships with significant impacts will be achieved."

Horizon Europe Regulation (common understanding): "European Partnerships shall be established for addressing European or global challenges only in cases where they will more effectively achieve objectives of Horizon Europe than the Union alone and when compared to other forms of support of the Framework programme. Those parts shall have an appropriate share of the budget of Horizon Europe. The majority of the budget in pillar II shall be allocated to actions outside of European partnerships."

- ➔ **Strategic Planning is based on identifying agreed Union priorities, and expected impacts (not activities) that can be translated into priorities for the Strategic R&I plan, including those that are green addressed by a Partnership approach**
- ➔ **COM services started with a much higher number of ideas, condensed as the result of intensive work between DGs**
- ➔ **Continuation of existing partnerships is not an objective per-se**

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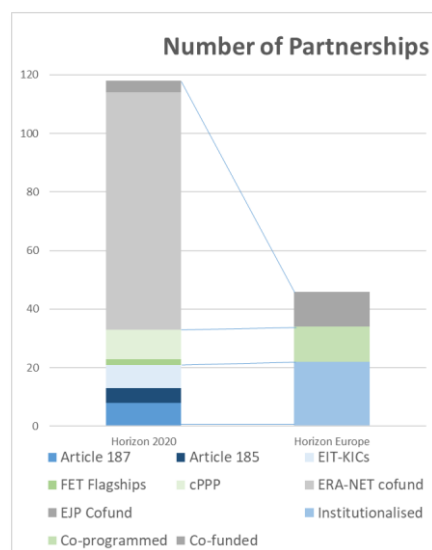
Emerging Partnership portfolio Horizon Europe

Rationalisation and reform achieved so far:

- Reduction from >120 (of all types) to currently 45;
- 6 new topics;
- 28 reformed continuations;
- 11 mergers and reforms;
- 35 partnerships candidates in Pillar II;
- 11 partnership candidates outside pillar II (9 EIT-KICs, SMEs, Open Science Cloud).

EU contributions/budgets:

- To be decided at a later stage following the overall MFF and Horizon Europe budgetary envelopes;
- To be determined once there are agreed objectives, and clear commitments from partners.



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Health

Rationalisation and reform:

Overall number reduced from 13 to 7, of which

- 4 are reformed continuations of current partnership topics;
- 3 partnerships that would build on existing actions or merge existing partnerships;
- No discontinuation, but merging.

CF: Co-funded

CP: Co-programmed

Current candidates	Type
▪ EU-Africa Global Health Partnership	A185/7, CP, CF
▪ Innovative Health Initiative	A187, CP
▪ European partnership for chemicals risk assessment	CF
▪ Pre-clinical / clinical health research	CF
▪ Large-scale innovation and transformation of health systems in a digital and ageing society	CF
▪ Personalised Medicine	CF
▪ Rare Diseases	CF
In addition: EIT Health	KIC

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Digital, Industry and Space

Rationalisation and reform:

- 7 reformed continuations of current partnership topics;
- 2 completely new partnership topics;
- 1 merger,
- Discontinued: 9 ERA-NETs, Partnerships with research funders (Member States).

CF: Co-funded

CP: Co-programmed

Current candidates	Type
▪ High Performance Computing	A187, CP
▪ Key Digital Technologies	A187, CP
▪ Smart Networks and Services	A187, CP
▪ AI, data and robotics	CP
▪ Photonics Europe	CP
▪ Clean Steel - Low Carbon Steelmaking	CP
▪ European Metrology	A185, CF
▪ Made in Europe	CP
▪ Carbon Neutral and Circular Industry	CP
▪ Global competitive space systems	CP
In addition: EIT Digital EIT Manufacturing EIT Raw Materials	KIC

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Climate, energy and mobility

Rationalisation and reform:

- Overall 6 reformed continuations of current partnership topics;
- 2 completely new partnership topics;
- Partnerships with Member States could be merged into 1 (national funding agencies);
- Discontinued: support to small number of JPIs / ERA-NETs.

CF: Co-funded

CP: Co-programmed

Current candidates	Type
Transforming Europe's rail system	A187, CP
Integrated Air Traffic Management	A187, CP
Clean Aviation	A187, CP
Clean Hydrogen	A187, CP
Built environment and construction	CP
Towards zero-emission road transport	CP
Mobility and Safety for Automated Road Transport	A187, CP
Batteries: Towards a competitive European industrial battery value chain	CP
Clean Energy Transition	CF
In addition: EIT InnoEnergy EIT Climate EIT Urban Mobility	KIC

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Food, Bioeconomy, Natural Resources, Agriculture and Environment

Rationalisation and reform:

Overall number reduced from 24 to 8, of which

- 2 are reformed continuations;
- 5 build on existing actions or merge existing partnerships;
- 1 completely new partnership topics;
- Discontinuation: possibly some partnerships with Member States.

CF: Co-funded

CP: Co-programmed

Current candidates	Type
Accelerating farming systems transition: agro-ecology living labs and research infrastructures	CF
Animal health: Fighting infectious diseases	CP, CF
Environmental Observations for a sustainable EU agriculture	CF
Rescuing biodiversity to safeguard life on Earth	CF
A climate neutral, sustainable and productive Blue Economy	CP, CF
Safe and Sustainable Food System for People, Planet & Climate	CP, CF
Circular bio-based Europe: sustainable innovation for new local value from waste and biomass	A187, CP
Water4All: Water security for the planet	CP, CF
In addition: EIT Food	KIC

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European Partnerships

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Candidates for institutionalised Partnerships



Timeline and process for the preparation of Article 185/187 initiatives

3 May – 27 June:	Structured consultation of Member States (as part of strategic coordinating process)
May:	Publication of draft Inception Impact Assessments and start of the Impact Assessment work
Mid-June until mid-September:	Open Public Consultation on future European Partnerships based on Article 185/187
24-26 September:	European R&I Days (policy discussion and validation with stakeholders, covers all European Partnerships)
End of 2019:	Submission of Impact Assessment drafts to Regulatory Scrutiny Board
Early 2020:	Adoption of Commission proposals for Article 185/187 initiatives
Early 2021:	Launch of first European Partnerships under Horizon Europe

Proposals for institutionalised Partnerships based on Article 185 / 187

Partnership area (Annex Va of the Regulation)	Proposal
Partnership Area 1: Faster development and safer use of health innovations for European patients, and global health	<ul style="list-style-type: none"> ▪ EU-Africa research partnership on health security to tackle infectious diseases ▪ Innovative Health Initiative
Partnership Area 2: Advancing key digital and enabling technologies and their use, including but not limited to novel technologies such as Artificial Intelligence, photonics and quantum technologies	<ul style="list-style-type: none"> ▪ Key Digital Technologies ▪ Smart Networks and Services ▪ EuroHPC (no Impact Assessment)
Partnership Area 3: European leadership in Metrology including an integrated Metrology system	<ul style="list-style-type: none"> ▪ European Metrology
Partnership Area 4: Accelerate competitiveness, safety and environmental performance of EU air traffic, aviation, transport and rail	<ul style="list-style-type: none"> ▪ Transforming Europe's rail system ▪ Integrated Air Traffic Management ▪ Clean Aviation
Partnership Area 5: Sustainable, inclusive and circular bio-based solutions	<ul style="list-style-type: none"> ▪ Circular bio-based Europe: sustainable innovation for new local value from waste and biomass
Partnership Area 6: Hydrogen and sustainable energy storage technologies with lower environmental footprint and less energy-intensive production	<ul style="list-style-type: none"> ▪ Clean Hydrogen
Partnership Area 7: Clean, connected, cooperative, autonomous and automated solutions for future mobility demands of people and goods	<ul style="list-style-type: none"> ▪ Safe and Automated Road Transport
Partnership Area 8: Innovative and R&D intensive small and medium-sized enterprises	<ul style="list-style-type: none"> ▪ Innovative SMEs

Discussion in the meeting of the Shadow Strategic Configuration of the Programme Committee

No discussion on the overall portfolio or candidates for co-programmed or co-funded partnership candidates, which will be done at the meeting of 27 June!

Feedback from delegations on each candidate should **focus on key issues** and address the following points:

1. Comments on the proposed objectives, expected impacts and related expected duration of the partnership;
2. For successors of existing partnerships: are the key changes proposed in line with the expectations towards reform and higher ambition of the partnership?
3. Feedback on the rationale to consider an institutionalised Partnership based on Article 185/187 (see *related provisions in the Regulation and the Criteria Framework!*).

Written feedback on the 3 key issues per Article 185/7 candidate possible until 10 May

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European Partnerships

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Cluster Health



Research and Innovation

**EU-AFRICA GLOBAL HEALTH PARTNERSHIP
ON HEALTH SECURITY
TO TACKLE INFECTIOUS DISEASES**

Partnership Area 1: Faster development and safer use of health innovations for European patients, and global health



What is the context and problem definition?

- Infectious diseases affect 1 billion people worldwide with 3 million deaths every year;
- Particularly sub-Saharan Africa suffers a huge health and economic burden.

Lack of effective interventions caused by key problem drivers:

- (i) Insufficient purchasing power of most affected patients (market failure);
- (ii) Insufficient capacities for clinical research in developing countries;
- (iii) Fragmentation of public funding (EU and beyond) impedes funding of costly large late-stage clinical trials.

The European and Developing Countries Clinical Trials Partnership (EDCTP), launched in 2003 and renewed in 2014 (Article 185), addresses these problems.

This new partnership supports;

- [Towards a Sustainable Europe by 2030](#);
- [2030 Agenda for Sustainable Development](#); SDG 3 and 17;
- [Africa-Europe Alliance for Sustainable Investment and Jobs](#);
- President Juncker's [2018 State of the Union Address](#); for an EU-Africa partnership of equals.

Map:
Country involvement in EDCTP activities:
Collaborative clinical trials and clinical studies
Capacity development (excluding fellowships)
Fellowship programme

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What are the objectives, expected impacts and scope?

Objectives: To increase health security in sub-Saharan Africa and Europe by:

- accelerating clinical development of effective, safe, accessible, suitable and affordable health technologies and health systems interventions for infectious diseases;
- in partnership with Africa and international funders.

Timeframe: Duration of Horizon Europe and beyond.

Expected impacts:

- Increased health security: decrease the threat of spread of outbreaks/pandemics and the growing threat of antimicrobial resistance (AMR);
- Reduced economic and social burden of infectious diseases;
- Strengthened European and African scientific capacity;
- Better and more integrated health research & health services in Africa;
- Retaining a new generation of African scientists & addressing the chronic shortage of health workers in developing countries.

Scope:

- Clinical development of new health technologies for detection, prevention and treatment of infectious diseases.

Key changes: Inclusion of health security and antimicrobial resistance in the scope, and additional partners (international funders) to increase impact.

Links with other partnership candidates: Innovative Health Initiative; Pre-clinical/Clinical Health Research Partnership; Animal Health Partnership; Neighborhood, Development and International Cooperation Instrument and External Investment Plan

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Why do we need an institutionalised European Partnership?

1. Public intervention: to tackle low investment due to market failure and the insufficient clinical research capacity in developing countries
2. EU level intervention: join up national research programmes & other funders
3. Create scale by common research and funding strategies and achieve the objectives required to tackle these important global health challenges.

Traditional calls, co-funded or co-programmed partnership are not an option:

1. Governance:
 - institutionalized partnership represents strong political commitment, joint action and full ownership by EU, Member States and African States – a precondition for sustainable development.
2. Delivery:
 - combating infectious diseases needs long-term commitment, a joint research agenda and synergies with partner countries and additional funders to achieve ambitious objectives (very costly late-stage clinical trials) and impact.

Preference for Art. 187 (vs. Art. 185) to match with EU funding, contributions of African participating states, industry and foundations (the latter two on an ad-hoc, call-by-call basis)– all key partners in leveraging funds for costly late-stage clinical trials, and to have a strong role of the EU in the governance .

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European
Commission

INNOVATIVE HEALTH INITIATIVE

Partnership Area 1: Faster development and safer use of health innovations for European patients, and global health

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What is the context and problem definition?

Context:

Europe has an **ageing population** and a **rising burden of diseases**. • Developing innovations is **often long, costly and risky**, while healthcare systems are under budgetary **pressure**. • Opportunity of **convergence of industry sectors** (pharma, med. tech., digital).

Problem:

Innovations are slow to reach the patients and users, or do not reach them at all if companies are unable to prove their safety and efficacy or if payers of the healthcare systems cannot afford them.

Causes:

• **Lack of complete understanding** of diseases • **Weak translation** of research into actual products and services • **Insufficient integration** of technologies and health interventions • **Barriers to digitalisation** • **Market failures** • Lack of adequate **business models**.

Earlier interventions:

IMI and IMI2 partnerships • Excellent in **promoting public-private cooperation** • Fostered **knowledge sharing** between pharmaceutical companies • Established **critical mass** for drug development • Initiated collaborations with non-pharmaceutical companies • **Opportunity** now for broader **cross-sectoral collaboration**

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What are the objectives, expected impacts and scope?

Partnership:

EU and health related industries (such as pharmaceuticals, diagnostics, medical devices, imaging, biotech and digital industries) • European **collaborative platform** for **precompetitive and integrative R&I**.

Overall objective:

Accelerate the development of **safer** and **more effective innovative healthcare interventions** that respond to **unmet public health needs**, and that can be taken up by healthcare systems.

Specific objectives:

• Facilitate **technology integration** to: progress disease understanding; enable the delivery of innovative health products and services; enable the combination of innovations along the healthcare pathway; overcome barriers to digitalisation, via standards, interoperability, etc. • Contribute to methodologies for **better assessing the value** of innovative interventions.

Expected impacts:

• Contribute to the **sustainability of the healthcare systems** • **Faster time-to-market** for innovative products • **New business** models • Incentive for industry to invest in **unmet public health needs** • Facilitate the delivery of **cost-effective** interventions • Improved **health outcomes** • Cross-sectoral industry **collaborations**.

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Why do we need an institutionalised European Partnership?

Requirements?

The magnitude and systemic nature of the problem addressed requires mass knowledge and resources sharing, and long-term, concerted actions from a broad range of stakeholders: academia, industry, SMEs, patients, regulators, healthcare providers, professionals, payers.

An institutionalised Partnership?

Can bring together the **broad spectrum** of stakeholders required with strong governance • **Deepest integration** of partners and activities • Creates a **long-term** dedicated implementing structure • **Strong engagement** and **up-front commitment** from partners • Leverages **contributions from industry** • Strong positioning of the EU in the **governance** • Exploits the well-known **IMI brand**.

Regular HE calls for proposals?

Could **not attract as many industry participants**, in a **cross-sectoral** manner, if industry is not involved in setting long-term research agendas • Do not offer the **scale** to maximise impacts • No **long-term** commitment from industry to anchor investments in Europe.

European Partnerships

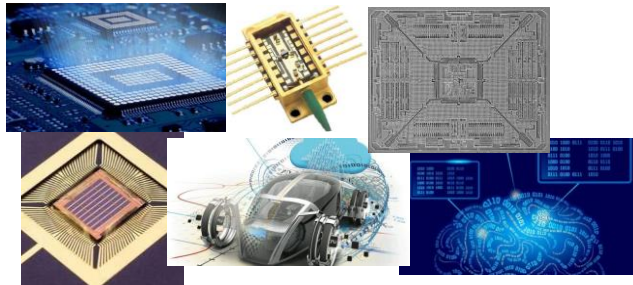
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Cluster Digital,
Industry and Space



KEY DIGITAL TECHNOLOGIES

underpin data capture, computing, communications, control and (artificial) cognition



Partnership Area 2: Advancing key digital and enabling technologies and their use, including but not limited to novel technologies such as Artificial Intelligence, photonics and quantum technologies

Key Digital Technologies (KDTs) context and problem definition

KDTs underpin the digital transformation of industry and society, and EU policies

- *KDTs of the future include advanced electronic components, quantum-chips, software and systems integration with links to advanced computing & communications, artificial intelligence & cybersecurity*

KDTs are essential for the competitiveness and sovereignty of European industries, incl. automotive & aeronautics, manufacturing & energy, defense & security, and subject to intense global competition

- *Europe needs to master the essential hardware, software technologies and systems integration to guarantee privacy, security, integrity of data and energy efficiency, and drive innovation in existing and future market segments*

Problems/Issues:

- *Rapid change for the electronics industry including big data which in turn requires: analytics, reduced computing time and energy-efficiency;*
- *End of Moore's Law: future "logic" devices, Fabless-Foundry vs Integrated Device Manufacturer;*
- *Linking physical and digital worlds to improve: supply and management of energy, intelligence and automation in production, personalised healthcare;*
- *Automation and cybersecurity: physical cognitive "devices" need to be resilient to hacks, cyber attacks;*
- *International developments: China/Asia/US increasing investments (and monopolies);*
- *Skyrocketing costs, very strong (shrink of) players, more vertical industries, new computing paradigms;*

Key Digital Technologies objectives and scope

Builds on ECSEL JU, accommodating today's technological, industrial and geopolitical reality. From primarily a focus on supply industry to:

- reinforce Europe's potential to innovate through robust digital value chains providing secure and trusted technologies tailored to the needs of "user industries"
- foster leadership in supply and demand-side industries in electronics value chains
 - *targeting suppliers of integrated components, equipment manufacturers, suppliers of materials and software, integrators of components & systems into final products & services*
- maintain R&I over time, retain key skills and maintain adequate means of production

Why an institutionalized partnership?

- coordination and synergies with EU, Member States and private representatives (industry & academia)
- aligning R&I efforts towards a single European strategy and combining EU, national and private funding optimises both the impact and the leverage for R&I investments
- central management of financial contributions towards simplification for beneficiaries
- further alignment with joint initiatives on HPC, AI and Cybersecurity as secure, low-power, high-performance components for data-processing becomes a real need and a competitive advantage
- use test-beds developed within other partnership areas such as Smart Networks and Services, EuroHPC, Made in Europe, Smart Mobility and others



Key Digital Technologies impact on societal challenges and industrial competitiveness

Breakthrough digital-based innovations for 2030+

- Foster world leadership in supply and demand-side industries in digital value chains
- Sharing R&I risks to address long term opportunities

EU support R&I in effective partnership with industry

- Increase competitiveness and sovereignty of European industries incl. automotive & aeronautics, manufacturing & energy, defense & security, ...

EU support R&I in effective partnership with Member States

- Step-up investment and scale through collaboration along value chains and across industry
- Expand markets, increasing SME participation as developers/users of advanced technology

Europe's contribution to global challenges through digital transformation

- Integration of intelligent components in systems and infrastructures for low-power "green-industry", personalized health, environmental monitoring, climate change,...

Fostering high-quality digital competences

- Supporting European sustainability in terms of knowledge and know-how for 2030+ technologies
- Fostering new, qualified jobs across Europe



SMART NETWORKS AND SERVICES



Partnership Area 2: Advancing key digital and enabling technologies and their use, including but not limited to novel technologies such as Artificial Intelligence, photonics and quantum technologies

Smart Networks and Services context and problem definition

- Connectivity and services critical infrastructure backbone for digital economy
- Human-centric Internet supporting values such as privacy, democracy and diversity
- Increasing strategic importance for European competitiveness and strategic autonomy in the context of fierce global competition (e.g. US, Asia)

Problems/Issues

- Next generation radio technology and signal processing enabling Terabit capacities and versatile spectrum use
- New technologies enabling smart connected devices in zero-latency systems and infrastructures
- Artificial Intelligence and Data Centric networks for self-healing systems and infrastructures
- Energy efficient optical/electronic integration from device to large-network levels
- Novel concepts and architectures for AI-enabled and secure software management tools and protocols
- Integrating next-generation highly dependable satellite communication systems
- Lack of large-scale experimentation and deployment (5G enabled corridors from automated driving/Smart Cities), with critical mass for a strategic approach for leadership and commitment of key European players

Smart Networks and Services objectives and scope

- Enable European R&I and industry to develop and deploy technology beyond 5G networks and services for new range of consumer applications and industrial use
- Deployment activities of 5G-based solutions in areas of public interest such as 5G Corridors for Connected and Automated Mobility or Smart Cities
- Synergies with programmes and facilities for large-scale experimentation and infrastructure deployment at EU and Member State levels
- Value-chain approach extending the scope towards next-generation cloud and IoT technologies and creating opportunities for the next wave of components and devices

Why an institutionalized partnership?

- Ensure a EU strategic approach towards programme definition and implementation with strong ownership of industry and Member States in view of Europe's strategic autonomy in this key technology area
- Combination of EU, national and private funding from industry, in particular as regards large-scale experimentation and deployment
- Synergies with programmes and facilities for large-scale experimentation and infrastructure deployment at EU and MS-level
- Support European consensus among stakeholders and Member States towards global standards, spectrum allocation and other regulatory issues



Smart Networks and Services impact on societal challenges and industrial competitiveness



EURO HPC



Partnership Area 2: Advancing key digital and enabling technologies and their use, including but not limited to novel technologies such as Artificial Intelligence, photonics and quantum technologies

EuroHPC context and problem definition

HPC essential for EU Digital Strategy supporting societal and economic challenges:

- early detection and treatment of diseases, new therapies
- understanding the human brain; designing new materials or drugs
- understanding and acting on climate change
- engineering/design – new production paradigms (airplanes or cars, etc.)
- critical asset for deployment of digital technologies: AI, cybersecurity or blockchain

No Member State has the means to develop the necessary full world-class HPC ecosystem on its own in competitive timeframes

Problems/Issues:

- EU has no top ranked supercomputers and depends on non-EU technology
- HPC strategies and investment plans with fragmentation of programmes and efforts in Europe
- Lack of a common procurement framework
- Insufficient coordination of national investments, most Member States have isolated approaches
- Substantial funding gap vis a vis USA, JP, CN
- Demand is not met (demand is at least 7-8 times bigger than the supply)
- Weak EU supply chain: Europe has 1/3 of the application markets but the EU suppliers' market share is less than 5% + weak integration of EU technology in HPC machines

EuroHPC objectives and scope

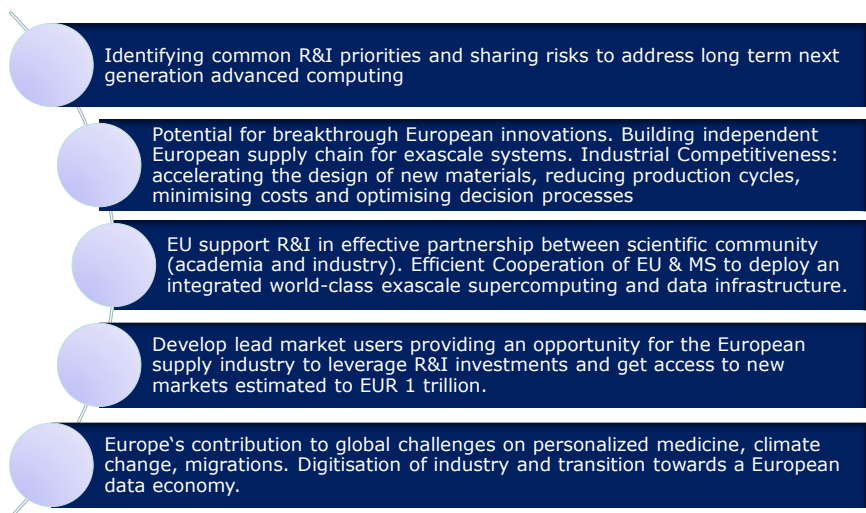
- Develop, deploy and maintain in the EU an integrated world-class exascale supercomputing and data infrastructure, supporting a highly competitive and innovative HPC ecosystem
 - Place Europe in the first three supercomputing powers of the world; Ensure European Researchers (academia, industry) reap the benefits of data-driven science
- Secure an independent and competitive HPC technology supply for the EU, including future computing technologies and quantum computing
 - Next generation low-power microprocessor, devices and logic sub-systems
 - Novel computing architectures and technologies for exascale/post-exa (including first hybrid HPC/Quantum)
 - Co-design software, algorithms, programming models, operating systems, leading to integration in novel architectures and prototypes/pilots; HPC and big data test-beds and application pilots
 - HPC Terabit connectivity between supercomputing centres

Why an institutionalized partnership?

- Ensure a EU strategic approach to combine public and private funds for R&I investment and effectively use joint procurements under EU-law
- Sharing resources and produce economies of scale to compete at global level
- Synergies with programmes for an ambitious research agenda, large-scale experimentation and infrastructure deployment at EU and MS-level



EuroHPC impact on societal challenges and industrial competitiveness





EUROPEAN METROLOGY

Partnership Area 3: European leadership in Metrology including an integrated Metrology system

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What is the context and problem definition?

- Scientific or technological advancement not possible without a supporting and functioning metrology system, in which the crucial measurements performed are **precise, accurate and traceable** back to reference standards;
- The current momentum of European leadership in metrology is a good opportunity. But there is still a gap in achieving a sustainable **European-wide system of fit-for-purpose area-specific metrology solutions that can act independently** of any dedicated metrology initiative;
- The metrology field provides an essential part of the Single Market, and enables unified understanding of measurements and trust in services and products across Europe. The proactive approach ensures a competitive edge in Europe, and **creates jobs** and ensures the implementation of the **Digital Single Market** and the achievement of the **Energy Union priorities**;
- Previous FPs have successfully demonstrated the potential of cross-border collaboration and joining of national mandates for metrology. A Horizon Europe intervention would make the collaborations **sustainable and independent through a European-wide strategy**.

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What are the objectives, expected impacts and scope?

Objectives:

- To create **European-wide metrology networks for strategic applications** that are self-sufficient and independent of any dedicated partnership support;
- To accelerate and increase the European lead in high-end metrology **capacity for emerging technologies** and to increase strategic cohesion in metrology across Europe;
- To enhance specific links to **standardisation, regulatory support, and regional capacity building**.

Timeframe: Duration of Horizon Europe



340M€ leveraged investment by October 2018

Expected impacts:

- Both trade and investment opportunities will be more focussed and coherent;
- Industries can become **more competitive** by taking advantage of harmonised infrastructures across borders;
- A transparent calibration system throughout any supply or value chain will enable **increased quality assurance** and a higher added value for any commercialised product;
- Any scientific discipline will benefit from **rapid, accurate and precise metrology/calibration services**, in particular in emerging fields.

Scope: To integrate and harmonise metrology research and to pool national and European resources for strategic priorities common to all Participating States.

Key changes: Creation of European Metrology Networks, with the inclusion of a **wider stakeholder base** such as an increased participation of academia and industry, as well as linked activities such as calibration services and quality infrastructure.

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Why do we need an institutionalised European Partnership?

- Public intervention: to provide the required metrology and quality infrastructure for emerging technologies and applications to maintain competitiveness;
- EU level intervention: Harmonise and pool efforts across Europe to tackle complex and European-wide challenges (> 50% integration);
- Create scale to maintain and extend the European lead in metrology;

Traditional calls are not an option for two reasons:

1. Governance:

- The institutionalised partnership allows for a good framework upon which national mandates and funding from Governmental programmes can be **committed for the full duration** of the partnership;
- The current implementation mode through an Art. 185 is the most efficient to **engage with the national institutes and gauge strategic priorities**.

2. Delivery:

- The long-term commitment encourages **forward-looking priority setting for complex and common challenges**, and enables additional value such as the creation of the European Metrology Networks;
- Traditional calls through the framework programme **will not enable the spin-off effects and widen the stakeholder base to also include the full European quality infrastructure**, including services such as calibration. Pro-active standardisation and regulatory support efforts will also be lost.



Europe, in previous partnerships, has been leading the recent redefinition of the SI units

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European Partnerships

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Cluster Climate Energy and Mobility

Research and Innovation



TRANSFORMING EUROPE'S RAIL SYSTEM

Partnership Area 4: Accelerate competitiveness, safety and environmental performance of EU air traffic, aviation, transport and rail

What is the context and problem definition?

Context

- Numerous advantages of rail in terms of environmental performance, land use, energy consumption and safety.
- Rail could play a significant role in accelerating the reduction in transport emissions.
However, in the recent years:
 - the share of passenger rail increased only marginally,
 - the share of rail freight decreased.
- Completion of the Single European Railway Area: on track but more needs to be done to remove remaining administrative, technical and regulatory obstacles in terms of market opening and interoperability.
- S2R JU under H2020 has demonstrated its clear added value.
- Opportunity to use automation and digitalization to transform performance of rail.



Problem definition

- Lack of competitiveness (cost efficiency) and attractiveness (reliability) of rail services, and lack of appropriate integration of freight;
- Need for deep coordination and alignment of public and private funding, given the complexity of rail.



What are the objectives, expected impacts and scope?

Specific objectives

- Strengthening the role of rail in the transport system by increasing the cost-efficiency and reliability of EU rail services
- Reinforcing the global technological leadership of the European rail industry

Expected impacts

- Increased rail performance and traffic
- Higher modal share of rail passenger and freight transport
- Reduced transport emissions



Scope

- System-integrated approach with decarbonisation, automation and digitalisation at the core
- Stronger focus on freight, integrating rail into digital multimodal mobility and logistics chains
- Introduce ad-hoc mechanisms to accelerate deployment and market uptake of innovations

Partners

- Comprehensive and better balanced representation of the sector across the EU
- Increase participation of SMEs and start-ups
- Transparent and simplified governance structure



Why do we need an institutionalised European Partnership?



- A common forward-looking vision for the Single European Railway Area embraced by all stakeholders
- Build critical mass to ensure the scale and scope required
- Ensure a systemic (not fragmented) approach to innovation, addressing all rail segments and subsystems in a coordinated manner, accelerating deployment and ensuring interoperability
- Legally binding commitments of the industry and a high level of engagement of all stakeholders
- Align standards and regulatory framework to agreed research outputs



INTEGRATED AIR TRAFFIC MANAGEMENT

Partnership Area 4: Accelerate competitiveness, safety and environmental performance of EU air traffic, aviation, transport and rail

What is the context and problem definition?

Context

- Annual air traffic is forecasted to grow steadily and will have to integrate new types of complex and highly automated operations (drones, urban air mobility, sub-orbital flight) challenging the limits of ATM systems in terms of capacity, environmental performance, safety and security.
- The Union needs a new and future-proof air traffic management system to efficiently address future challenges of all air operations.

Challenges

- Support the Union's aviation policy, and in particular the Single European Sky as well as the European certification and standardisation activities
- Develop, validate and deploy, in a timely manner, interoperable global ATM solutions, that allow systems to efficiently and safely accommodate capacity needs by:
 - Enabling environmentally efficient air operations through a total system approach targeting "zero energy waste" and including airports and airlines
 - Achieving greater levels of automation and secure data sharing while mitigating risks related to digitalisation (security, cyber threats, data protection and the role of humans)
 - Shortening of innovation cycles while taking into account safety critical and global nature of aviation infrastructure modernisation
 - Offering a better travel experience for citizens and more efficient services for businesses
 - Promoting multi-modality and urban air mobility integration



What are the objectives, expected impacts and scope?

Objective

- Modernise air traffic management services in Europe by delivering technical and operational interoperable and standardised solutions to address the future challenges of a more digitalised and sustainable aviation characterised by higher levels of autonomy.

Expected impacts

- Enable a fully energy efficient and environmentally responsible aviation infrastructure
- Increase ATM capacity to cope with growth in demand for airspace and on airports
- Shift the ATM system from physical infrastructure to digital services
- Increase aviation safety levels
- Safe integration of all flying vehicles into the EU ATM systems
- Boost European industry globally
- Improve customer experience and business opportunities

Scope:

- Involve a wide range of civil and military stakeholders (manufacturing industry, service providers, airports, airspace users, academia & staff, SMEs/start-ups, national aviation authorities) including non traditional aviation actors as well as EASA and intergovernmental organisations such as Eurocontrol
- Achieve the digital transformation of the European airspace: "digital European sky"
- Coordinate all ATM definition, research, development and demonstration activities in the EU all the way to setting the next generation standards and de-risking market uptake within a comprehensive and EU policy driven innovation cycle
- Execute the European ATM Master Plan endorsed by the Council and regularly maintained

Links to candidate partnerships

- Clean Aviation, other transport modes partnerships and smart cities initiatives



Why do we need an institutionalised European Partnership?

- To provide a long-term, stable strategic framework for innovation under a EU oversight and policy to achieve the interoperable and synchronized modernization of the common European airspace and network
- To have a stable governance ensuring the long-term commitment of all stakeholders involved considering the longer innovation life-cycles related to the complexity of infrastructure and services modernisation
- To ensure that the activities of the industry and all aviation stakeholders are aligned with Union's policy priorities
- To optimise allocation of Union funds and effectively handle conflicts of interests linked to the execution of the European ATM Master Plan endorsed by the Council of the European Union
- To support the EC in setting future policies, evolving the regulatory framework in view of encouraging innovations (e.g. impact assessments) and monitoring deployment of innovation
- To secure the proper involvement of regulatory authorities in assessing the safety of innovative solutions
- To create economies of scale by pooling dispersed resources and aligning efforts including EASA agency, National Aviation Authorities and from intergovernmental organisations such as Eurocontrol that play a significant role in air traffic management and executes EU mandated functions
- To have a strong voice at global level and promote European standards towards ICAO



SAFE AND AUTOMATED ROAD TRANSPORT

Partnership Area 7: Clean, connected, cooperative, autonomous and automated solutions for future mobility demands of people and goods

*Proposed acronym: MOSART (**MO**bility and **Sa**fety through **A**utomated **R**oad **T**ransport)*

What is the context and problem definition?

Context

- Mobility is crossing a new – digital – frontier with increasing automation and connectivity
- The evolving and complex ecosystem of automated road transport involves interactions between physical and digital infrastructure, vehicles, technologies and people, posing numerous challenges: human, technical, societal, economic, regulatory
- At the same time it gives the prospect of helping EU fulfill its ambitious goals of road safety, traffic efficiency, air quality, reduction of energy consumption and fight against climate change

Problem

- Fragmented approach and lack of a long-term strategic vision how CCAM research, innovation and development activities could help respond to these challenges (annual calls for proposals, national rules for testing, gap between research and deployment, etc.)
- No mechanism to pool investments at local, regional and national level, both of public and private nature;
- Dispersed efforts → a missed opportunity to ensure EU's R&I in this domain sufficiently supports achieving the policy goals and industry competitiveness at the global level



Hence the proposal to set up a Partnership announced in Commission's Communication "*On the road to automated mobility: an EU strategy for mobility of the future*" of 17 May 2018



What are the objectives, expected impacts and scope?

Objective

Create a clear framework for pooling resources, strategic planning and streamlining all relevant CCAM research, innovation and development activities and linking them with large-scale validation and pre-deployment.

Timeframe: Duration of Horizon Europe and beyond.

Expected impacts:

Better coordinated and scaled up CCAM research, leading to:

- Improved mobility thanks to coherent approach across the EU towards an integrated European cooperative, connected, automated and autonomous road mobility system
- Improved road safety
- Improved traffic efficiency
- Reduced impact on the environment
- Accelerated R&D and faster time-to market to maintain EU industry leadership in the field

Scope:

- Support use cases (passenger cars, freight, urban mobility)
- Help tackle challenges related to security, privacy, liability, ethics, interoperability, transition, governance
- Help manage interfaces with other transport modes (drones, light rail, ...),
- Help measure impacts (safety, efficiency, acceptance, ...)

Links: S2R, SESAR, ECSEL, 5G, AI, 2ZERO, ...



Why do we need an institutionalised European partnership?

Why a Partnership?

- Respond to stakeholders' demands for a **coordinated approach on R&I** at EU level to facilitate their decisions on **long-term investments**, deployment of digital infrastructure, adaptation of roads and development of new vehicle types
- **Coordinate testing efforts** to avoid a patchwork of different technical / legal solutions across EU, hampering interoperability and continuity of services

Why Institutionalised?

- Ensure an EU strategic approach towards programme definition and implementation with **strong ownership of industry and Member States** in view of Europe's leadership in this **complex and disruptive mobility area**
- **Combine** EU, national and private **funding**, and **establish synergies** between programmes and facilities for large-scale experimentation and deployment
- Set up a **legally binding governance structure** with **upfront commitment** to pursue common objectives and clear deliverables, creating scale and aligning efforts.
- Support **European consensus** among stakeholders and Member States towards **global standards and regulatory issues**, fostering pre-deployment activities



CLEAN AVIATION



Partnership Area 4 (legal text):

Accelerate competitiveness, safety and environmental performance of EU air traffic, aviation, transport and rail

What is the context and problem definition?

Context: Future aviation opportunities are associated with environmental challenges:

- EU aviation CO₂ emissions increased from 88 to 171 million tons (+95%) between 1990 and 2016 (European Aviation Environmental report 2019)
- European aviation represented 20% of global aviation's CO₂ emissions in 2015 (European Aviation Environmental report 2019)
- Annual traffic estimated to increase worldwide ~**4.4%** (doubles every 15 years - ICAO, Airbus GMF 2018)
- Annual worldwide fuel consumption and emissions are estimated to increase ~**3%** (due to the growth in the number of flights, aircraft size and flown distance)
- Introduction of state-of-the-art technologies is estimated to reduce fuel and CO₂ emissions only by **1-1.5%** annually

Challenges:

- Global aviation GHG (Green House Gases) emissions represent more than 2% of global GHG emissions and rising fast
- Without transformative solutions, CO₂ aviation emissions projected 80% higher in 2050 than 2020 (JRC Global Energy and Climate outlook 2018)
- Non-CO₂ emissions (e.g. NO_x, particulates and noise), will also substantially rise

Political context: A Clean Planet for all, Mobility Package and Energy Union

How has the problem been addressed in past FPs? CS1&2 created a European aviation well-structured landscape, with spread and diverse targets. Partially pre-assigned budget and big number of partners led mainly to incremental progress, but with marginal environmental impact at aircraft and fleet level

What are the objectives, expected impacts and scope?

Objectives

- To accelerate development and demonstration of integrated aircraft technologies, towards **deep decarbonisation** and significant reduction of all other emissions concurrently (e.g. NO_x, particulates and noise), while ensuring safety, security and European leadership

Expected Impacts

- Reduce CO₂, non-CO₂ and noise emissions (e.g. a 50-80 passenger hybrid-electric flying demonstrator (TRL6) aircraft nearly emission-free and silent by 2030).
- Increase aviation safety and security levels
- Boost a globally competitive sustainable European aviation industry

Scope

- Involve a wide range of aviation stakeholders (including EASA) and non-aviation leaders in innovation in areas such as alternative fuels, electrification and digitalisation
- Aim at focused, transformative and impact oriented research & demonstration activities
- Ensure the scale-up of innovative environmental solutions for fast-track insertion in current & future aircraft
- Create a multitude of spin-offs, through synergies with other ecosystems for the benefit of citizens (e.g. disaster response, space, security)

Links to candidate partnerships

Integrated Air Traffic Management

Why do we need an institutionalised European Partnership?

- To ensure that research activities of industry are aligned with Union's policy priorities (e.g. climate change)
- To reduce the industrial risk for transformative R&I
- To ensure long-term industrial commitments needed for long innovation cycles ensuring a direct leverage and a high level of engagement of all stakeholders
- To deliver capabilities and integrated technology blocks for fast-track insertion to a multitude of products (compared to pre-competitive R&I)
- To optimise allocation of Union funds
- To create economies of scale by pooling disperse resources and aligning efforts at EU, national and regional levels

CLEAN HYDROGEN

Partnership Area 6: Hydrogen and sustainable energy storage technologies with lower environmental footprint and less energy-intensive production

What is the context and problem definition?

Context – The Clean Energy transition

- Near zero-carbon Hydrogen, and its associated technologies, such as fuel cells, constitute an important decarbonisation pathway for a wide range of end-use sectors, in particular the hard-to-abate ones such as industry (steel, chemical, refining etc.), heating, or heavy-duty transport applications (trucks, ships and rail).
- Hydrogen is also an enabler of high penetration rates of renewables as it facilitates sectorial integration and offers a promising option for long-term/large-scale electricity storage.

Challenges

- Develop, validate and deploy in, a timely manner, Hydrogen and fuel cells technologies and allow production and use of Hydrogen at gigawatt-scale.

While the existing Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU) has been instrumental in developing key technology bricks and bringing the first generation of products to the market, clean/near-zero carbon hydrogen is still a nascent sector - massive cost reductions and technology improvements are still necessary for commercial deployment at a scale that would correspond to the decarbonisation needs at the energy system level.

This new partnership supports "A Clean Planet for All" Communication (COM(2018) 773 final), which concludes that "[...] the role of hydrogen is likely to become more prominent in a fully decarbonised energy system [...]".



What are the objectives, expected impacts and scope?

Objective

- Create a strong, innovative and competitive European Clean Hydrogen sector , fully capable of underpinning the European clean energy transition by enabling deep-decarbonisation across various energy-consuming sectors.

Expected impacts

- Reduce cost of hydrogen and fuel cells solutions
- Develop competitive hydrogen and fuel cells solutions for heavy duty applications
- Reduced impact on the environment
- Accelerated R&D and faster time-to market to maintain EU industry leadership in the field

Scope:

- Development of technologies and infrastructure for safe and cost-efficient, production, transport, storage and use of hydrogen.
- Address the main technological bottlenecks of hydrogen and its associated technologies such as cost reduction, efficiency and durability.
- Coordinate Clean Hydrogen and fuel cells research, development and validation activities in the EU within a comprehensive and EU energy and climate policy driven innovation cycle

Links to candidate partnerships

- 2ZERO, Batteries, Build environment, Rail



Why do we need an institutionalised European Partnership?

- Due to **hydrogen's versatility**, the structure of the hydrogen sector is still very fragmented, which requires high level of coordination, structuration and prioritisation that can only be achieved through an institutional partnership
- To have a stable governance ensuring the long-term commitment of all stakeholders involved
- To ensure that the activities of the industry are aligned with Union's policy priorities
- To safeguard long-term industry commitment and investments that are necessary to bring the hydrogen sector to the level where it can play a meaningful role in the European energy transition.



European Partnerships

#HorizonEU

Cluster Food,
Bioeconomy Natural
Resources, Agriculture
and Environment



Research and
Innovation

CIRCULAR BIO-BASED EUROPE: SUSTAINABLE INNOVATIONS FOR NEW LOCAL VALUE FROM WASTE AND BIOMASS



Partnership Area 5: Sustainable, inclusive and circular bio-based solutions

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What is the context and problem definition?

- **Transition to a healthy planet:** biomass and waste for the production of renewable products and nutrients;
- **Climate mitigation:** Fossil material substitution, carbon storage in bio-based products and land-based carbon sinks;
- **Circularity:** bio-waste into valuable products, recovery of nutrients and minerals substitution;
- **Regional and rural regeneration and economic development.**

Lack of effective interventions caused by key problem drivers:

- (i) Major technological and innovation challenges;
- (ii) High risk and cost of demonstration and deployment (e.g. bio-refineries);
- (iii) Uncertainty around feedstock availability and cost;
- (iv) Fragmented policy framework across the EU;
- (v) Bio-based is multi-sectoral*, thus fragmented and complex value chains.

Building on the achievements of the BBI Article 187 Initiative (running until 2024) and SPIRE contractual PPP (running until 2020)

This new partnership would contribute to:

- Updated Bioeconomy strategy and Circular Economy package;
- Clean Planet communication ; Towards a sustainable Europe by 2030;
- CAP, Industrial policy, SDGs...

*forest-based, agro-food, marine-based, bio-waste processors, chemical, biotechnology, cosmetic, construction, textile, others

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What are the objectives, expected impacts and scope?

Objectives: Building a circular bio-based Europe via sustainable innovations for new local value from waste and biomass; unlocking investments and markets.

Timeframe: Horizon Europe and beyond

Expected impacts:

- ✓ **Scientific:**
Creating long term S&T basis in the EU; keeping innovation in the EU;
- ✓ **Environmental**
Reduction of GHG emissions; preserving and restoring ecosystem services and biodiversity; circularity: reducing waste, closed-loop production; reducing nutrient pollution;
- ✓ **Social**
Revenue generation for primary producers. Additional job opportunities in rural areas. Inclusive business models. Rural regeneration by reindustrialisation;
- ✓ **Economic**
Security of raw materials supplies by using local resources. Productivity & growth
Leverage of investments, engagement and commitment of relevant actors.



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Key changes: **Broader scope;** **strengthen synergies** with other initiatives; **enlarge range of actively involved stakeholders** beyond industry (primary producers, end users and brand owners and from regional and local authorities to civil society).

Links with other partnership candidates: Carbon neutral and circular industry; Built environment and construction; Climate neutral, sustainable and productive Blue economy.

Why do we need A European Partnership?

A European partnership in the Co-Programmed or Institutionalised form would allow to bring the different actors of this multi-sectoral segment of the bioeconomy under one pan-European roof, enabling them to collectively build on their foundations and thus to address problems and opportunities to tackle in a more systemic, efficient and impactful way.

No European partnership, but instead traditional calls under Horizon Europe

→ Risk of low leverage and less coherent alignment with national, regional and local regulatory frameworks; overcoming the fragmentation of sector would be less addressed.

Option 1: Co-programmed European Partnership:

- Favours openness towards engagement with public and private stakeholders. Allows flexibility in programming, priority setting and governance, while leveraging private and public investment

Option 2: Institutionalised European Partnership

- BBI Initiative demonstrated added value to mobilise stakeholders, private investment and structure the bio-based sector
- Vision document "The Circular bio-society in 2050" by a group of relevant stakeholders, does not however allow to answer the main aspects of the selection criteria for Institutionalised European Partnerships
- Difficulty of the current partner under the BBI Initiative to deliver on its committed financial contribution

The selection of the option will be subject to the results of the Impact Assessment and the demonstration of ex-ante commitments of the potential partners, in line with Better Regulation and an impact driven approach.



European Partnerships

#HorizonEU

Pillar III 'Innovative Europe'



Research and Innovation

INNOVATIVE SMES

Partnership Area 8: Innovative and R&D intensive small and medium-sized enterprises

What is the context and problem definition?

- Europe is good at creating start-ups, but too few go on to grow and scale-up. The 'lost decade' triggered by the economic and financial crisis left the EU with an uneven economic and productivity growth pattern across Europe, both in differences between Member States and regions but also between the fast-growing, innovative companies and the lagging companies, in particular for SMEs (see Innovation Scoreboard 2018);
- The partnership builds on the experience of the Eurostars2 Article 185 initiative. Eurostars3 with a broader set of activities and reach, long term public financial commitments and complementarity and coordination at EU and national level, will enable the growth of a new generation of innovative SMEs and deliver increased added value and impact to Europe;
- While SME support programmes have been core components of regional and national research and innovation policies for a long time, their inherent national focus limits their impact. This is increasingly the case, with SMEs directly addressing global markets instead of slowly expanding their home markets;
- There is a need for public support programmes to align with the ambitions of businesses, particularly as companies see access to national and international markets as one of the biggest barriers to being able to scale their business (Scaleup Institute Annual Scaleup Review 2018).

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What are the objectives, expected impacts and scope?

Objectives: support fast-growing and innovative SMEs to develop new products, processes and services that help to improve the daily lives of people and boost European competitiveness.

More specifically :

- Act as an growth platform and innovation multiplier at EU level by providing access to new knowledge, collaborations, value chains and market opportunities, and thereby leading to improved market share and sales for participating SMEs;
- Speed up time-to-market;
- Support business growth and scale-up globally leading to increased employment and turnover;
- Contribute to de-risking SME finance through leveraging of private investment and public funding;
- Increase European added value by fostering synchronisation and harmonisation of national supporting instruments (increasing efficiencies at national and EU level);

Expected impacts:

- Strengthening EU's technological base; Fostering the competitiveness of its industry and Strengthening the European Research Area;
- Accelerate industrial transformation; Stimulate the creation and scale-up of innovative SMEs; Improve access to risk finance and Strengthen international collaboration,
- Contribute to reduce the fragmentation of the European innovation support landscape

Timeframe: Horizon Europe and beyond

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Why do we need A European Partnership?

A European partnership in the Co-Programmed or Institutionalised form will allow joining forces between Eurostars countries, the European Commission and the EUREKA Association, offering a stability that will bring the highest added value, leverage and efficiency.

The long-term commitment of the majority (or all) the Member States will be more easily attained through continuation of the previous partnership with regard to synchronisation, harmonisation and future common objective.

A harmonised evaluation, selection and funding model will provide a high degree of integration between partners that will help achieving strong additionality and directionality to fund the best innovative SMEs.

The support of Council and Parliament will give the partnership higher political visibility, which is necessary for several countries to ensure the national support.

An institutionalised partnership best reflects EUREKA's intergovernmental nature, as Ministers are involved in the decision-making process of both EUREKA and institutionalised partnerships.

No European partnership, instead traditional calls under Horizon Europe

Co-fund option based on the Horizon Europe policy approach: 'institutionalised partnerships' only if other implementation modes would not be able **to achieve the same impacts**.

Key issues to consider :

- **Legal basis and governance:** steering power of participating states, political visibility and influence
- **Implementation:** flexibility and steering power of participating states when implementing Eurostars 3 programme
- **Administrative efficiency:** (maximised) level of administrative simplification for COM services, participating states (incl. DIS) and beneficiaries that can be obtained

Taking notably into account also the requirement of 'centralised financial management' for institutionalised partnerships

