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Inhalte

1. /HORIZON EUROPE*/ Mid to long term and systems integrated energy storage, deadline: 19. October 2022 17:00 Brussels time

Energy storage is required to increase energy systems flexibility, sectors coupling, demand response and smart interoperability solutions. Storage technologies facilitate high penetration of intermittent renewable energy, enable energy efficiency technologies such as waste heat recovery, increase the efficiency of cold supply chains and in turn contribute to the ecologic transition.

Non critical raw materials (CRM)-based systems and processes integrated, life cycle driven technologies are needed, in order to develop low cost and competitive solutions. Particular attention will be paid to high round-trip efficiency, high energy density, stable and reliable solutions for mid to long term energy storage (from days to months), which represent the most needed services for flexible, sustainable and fully integrated energy systems.

This Challenge will support proposals from the following technologies and systems for stationary applications:

- o mid/long term energy storage for power systems, with technologies such as metal air or redox flow batteries, power to heat to power, chemical bonds, electrochemical/chemical/thermal hybrid solutions, integration of energy carriers and 'storage to X' strategies; concepts for centralised or decentralised applications at grid, industrial or district scale level are included, excluding micro and small scale or single building solutions;

- o mid/long term thermal energy storage (heating or cooling) at different temperature, such as building integrated and process systems integrated solutions, chemical looping or thermochemical storage, solar thermal energy harvesting and storage, combined storage of thermal and electrical energy as well as other energy vectors, storage systems integrated in cold chains and in industrial processes.

Specific objectives

The proposals, through non CRM-based systems integrated, life-cycle and circular thinking driven approaches, should develop a proof of concept (PoC) or lab-scale validated innovative mid to long term storage for centralised or decentralised applications ranging from large to mid scale and excluding small micro scale such as single building solutions. The proposed technologies include, but are not limited to, the following:

- o computational modelling and optimisation applied to materials, components and control (i.e. charging/discharging) for storage;

- o heating/cooling storage through chemical and thermochemical technologies (adsorption, absorption, etc.) included their integration in buildings or industrial processes and for different temperature;

- o integration of energy storage systems into multi-vector energy grids and existing infrastructures, or into industrial processes for waste energy recovery and industrial symbiosis including concepts to enable smart control;

- o systems-integrated thermal energy storage technologies for industrial and building applications (i.e. energy storage combined to solar and geothermal energy conversion, to pumped heat technologies, or to combined cooling, heat and power generation);

- o innovative concepts for hydrogen (H₂) storage/compression combined with thermal energy management and storage.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-02;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

2. /HORIZON EUROPE*/ DNA-based digital data storage, deadline: 19. October 2022 17:00 Brussels time

Current technologies for digital data storage are hitting sustainability limits in terms of energy consumption and their use of rare and toxic materials. Moreover, data integrity when using those technologies is limited in time, which complicates archival data-storage. DNA or certain classes of synthetic DNA alternatives provide an alternative that promises information densities that are several orders of magnitude higher than classical memories, and stability for millennia rather than years. Moreover, DNA-based data storage can profit from the growing range of DNA research, tools and techniques from the life sciences, while potentially also adding to it (e.g., for in-vivo data collection). Proof of concept for DNA data archiving in vitro (i.e. not in living cells) is now well established. Several studies have shown that such archiving can support selective and scalable access to data, as well as error-free storage and retrieval of information. However, technical challenges remain to make this process economically viable for a broad spectrum of uses (beyond so-called 'cold data') and data types. These relate to improving the cost, speed and efficiency of technologies for reading, and especially writing and editing, DNA or other information-storing bio-polymers.

Large corporates and governments are starting to show an interest and some smaller companies offer solutions for specific archival applications. Europe has academic and commercial potential in this area. The time is right to pull together a European R&I ecosystem on DNA-based digital data storage. This EIC Pathfinder Challenge is to explore scalable and reliable high-throughput approaches for using DNA as a general data-storage medium. Solutions would thus need to address the read/write/edit operations of digital data in synthetic DNA, capturing the expected advantages of high density and stability/longevity of this form of data storage. The use of DNA sequences as chassis for non-standard forms of information coding, or of other polymeric substrates and related coding/decoding techniques are also in scope, provided they entail at least similar benefits than state-of-the-art DNA approaches. Proposed techniques should deliver qualitative advances in key parameters such as throughput, DNA-length (well above a few hundred mers), reliability (coupling efficiency), speed and cost. Beyond the usual storage applications, there is also scope for radically different scenarios for such a technology, for instance for data-processing, in-vivo sensing or fingerprinting.

Applications submitted to this Challenge, must pay particular attention to the relevant bio-safety and ethical issues.

Specific objectives

The following specific objectives for this Challenge have been defined:

- o new approaches for coding, decoding, modification or computational use of digital data in synthetic DNA or other sequence-controllable polymers with quantitative targets (theoretical and technological);
 - o Proof-of-Concept of technical feasibility with indications of at least state of the art benefits and major operational characteristics (e.g., extreme densities, longevity, stability) and going well beyond for some of them (e.g., speed, cost, accuracy);
 - o end-to-end scenarios of use, be it for data storage (archival, but also shorter term storage) or other purposes (like sensing, cryptography or computation) that exploit the benefits of the technology.
- Expected outcomes and impacts

Proposals should contribute to achieving one or several of the following:

- o a range of new techniques with clear benefits and steps towards widening scope of applicability of DNA-based data storage;
- o broader range of scenarios and uses for DNA-based data technologies;
- o emergence and anchoring of a European innovation eco-system on DNA-based data technologies and applications, including through involvement of relevant partners and end-users;
- o contribution to standardisation in the field and benchmarks to gauge progress.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-05;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

3. /HORIZON EUROPE/ Cardiogenomics, deadline: 19. October 2022 17:00 Brussels time

Cardiogenomics holds the potential to address existing gaps in the diagnosis and treatment of cardiovascular diseases (CVD), which would enable better outcome for the patient. Advanced genetic testing taking into account complex inheritance, or combining genetic testing, transcriptomics, proteomics and metabolomics analysis with clinical phenotype can improve clinical management of the CVD and identify more accurately, who is likely to be at risk for major cardiovascular events such as heart failure or sudden death. Many gene variants associated with CVD are of unknown significance and thus of limited clinical utility. Our ability to sub-classify CVD diseases according to their underlying molecular mechanism has been enhanced due to technological approaches such as, spatial or single-cell transcriptomics, and others.

There has been considerable funding in the past directed to support and improve the quality of life of patients with severe heart and other CVD conditions (e.g. development of bio-electronic implants/devices). On the other hand, there has been considerably less public funding allocated to demanding research targeted to the actual cause of major CVDs and their complex genetic basis and as a result, limited progress has been made in this front. Although, the complex genetic basis of some of the inherited cardiovascular conditions, such as, the cardiomyopathies is widely accepted, it remains far from being elucidated. In addition, already identified gene variants can demonstrate variable expressivity (clinical phenotype severity), challenging the clinical interpretation of the variants identified in a patient and the selection of the therapeutic tool. As per the major common diseases such as heart attack and atrial fibrillation, the genetic basis is incompletely understood.

Companies are therefore increasingly raising funding to support their preclinical CVD programs aimed to develop key molecules that can disrupt signalling pathways that regulate key cardiovascular processes including rhythm, hypertrophy, contractility, and autophagy and others, potentially leading to new therapies for heart failure or other CVD conditions. The overall aim of this Challenge is to pave the way for novel therapies for major CVD conditions including hemorrhagic and ischemic stroke, aneurysm, cardiomyopathy and certain types of arrhythmias and other conditions, for which no effective treatments are currently available.

The gender dimension in research content should be considered, where relevant.

Specific objectives

The following specific objectives have been identified for this Challenge:

- o to identify single or multiple gene variants of high biological significance or other key molecules associated with the CVDs that would allow for accurate stratification of patients and guide the physician in their clinical management and monitoring of these CVDs;

- o to identify novel targets based on these variants for specific CVD indication(s) that would allow for the development of first in class therapies for the same indication;
 - o to seek for novel technological solutions that could contribute to the development and acceleration of first in class therapies for major CVD conditions for which no effective treatments are currently available.
- Expected outcomes and impacts

The following major impacts can be foreseen for this Challenge:

- o impact on the practice of cardiology: identification of pathogenic mutations or multiple variants that have actionable effects (by disrupting normal biochemical pathways associated with the cause and/or progression of the disease), will have a substantive impact on the practice of cardiology;
- o accelerating the implementation of personalised care in CVD: deciphering the molecular pathogenesis underlying the clinical pathology of a CVD disease, is key for implementing personalised care. Performing targeted DNA sequencing on CVD patient(s) to identify previously characterised pathogenic mutations, is expected to become part of the daily clinical routine in the CVD clinics. Targeted genetic testing is envisaged to serve a triple purpose:
 - o to achieve an early and more accurate diagnosis;
 - o to guide the physician to administer the right treatment for the right patient (personalised treatment);
- and
- o to predict more accurately post treatment clinical course (favorable or non- clinical prognosis).
- o gathering the necessary knowledge and data that would enable to apply disease modelling for CVD, including through 3D in-vitro models, to be used for screening drugs/therapies for CVDs.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-03;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

4. /HORIZON EUROPE*/ Towards the Healthcare Continuum: technologies to support a radical shift from episodic to continuous healthcare, deadline: 19. October 2022 17:00 Brussels time

Today, episodic (symptom-triggered) healthcare remains the norm. To a large extent, individuals are entrusted with the responsibility to self-monitor and trigger requests to the health system upon identification of relevant symptoms. In spite of the growing number of screening programmes, the diagnosis of a vast majority of disorders, including those in which early action has a direct impact on morbidity or survival, still relies heavily on the individual to initiate the process. Further, a substantial fraction of outpatients manage the post-treatment phase, particularly of non-life threatening conditions, with qualitative self-monitoring, seeking help only upon perceived evidence of disease recurrence. In essence the current approach to healthcare is mostly reactive.

While the episodic (reactive) model could be perceived as economically advantageous, drawing on healthcare resources only intermittently, it is clearly not optimal. In self-assessing their health status independently, individuals miss early signs of disease, sometimes with devastating results. The large spectrum of possible conditions and associated symptoms, particularly as age progresses, and the high behavioural resistance to seek medical assistance without clear symptomatic evidence, compounds the problem. Often the prodromal phase advances to full blown symptomatic phase before the diagnosis is triggered by the patient. Further, the emotional burden under the episodic healthcare model in which individuals are responsible to gauge severity and make decisions on when and how to seek help, should

not be underestimated. Periods of raised health awareness, chronic conditions, slow convalescent recoveries, etc. in adult and pediatric populations can be particularly emotionally draining for patients and families under the episodic care model.

Technology can support much needed progress towards continuous and preventive healthcare, in which individuals are accompanied continuously and unobtrusively by health monitoring technology and practitioners, proactively offering diagnosis, treatment or follow up at the optimal pace and with the optimal protocol as dictated by clinical evidence. Under this model, human beings will heavily rely on technology seamlessly integrated in their lives, becoming recipients of proactive healthcare with minimal disruption and cognitive load. The burden of early spotting of disease will be shifted to unobtrusive technology. This requires careful consideration of all potential ethical issues that may arise, particularly related to data processing, data ownership and trustworthy artificial intelligence. Successful examples of such technologies already exist. Continuous Glucose Monitoring (CGMs) devices in skin-patch formats, for instance, offer diabetics relative unobtrusive and uninterrupted detection of inadequate glucose levels, with the possibility for remote diabetes care. Furthermore, body motion sensors (e.g., accelerometer-based), respiration monitors and oxygen saturation (SpO₂) sensors, cell phone-enabled behavioural analysis, fitness devices and many others are also available.

However, the full potential of the continuous healthcare model has not been fully realised as, for most conditions, diagnostic technologies do not exist with the required attributes: unobtrusiveness (environment-embedded, body-embedded, object-embedded, home-integrated, etc.), clinical grade reliability, affordability, etc. For example, faulting-free on-skin, under-skin or implantable bio-sensors for long-term use, new modalities for Volatile Organic Compound (VOC) sensing (breathomics), new personal imaging systems e.g. THz-based or optoacoustic, unobtrusive continuous gut microbiome monitoring, etc. still require substantial groundwork.

The objective of this EIC Pathfinder Challenge is to develop systems and technologies starting at very low TRL for unobtrusive monitoring of human health with new continuous and personal imaging and sensing modalities, implementing continuous assessment, processing and analysis of the data to identify early signs of disease

This call can support innovative technologies ranging from the sensor level up to the system level for effective integration of multimodal data.

Proposals can aim at monitoring a family of conditions or a wider mix of health factors, using the optimal combination of single-point or historic multi-point sensor data and, if appropriate, clinical records, genomic data, etc. to realise maximal performance.

Involvement of relevant stakeholders (e.g., clinical experts and patient organizations) from an early stage is recommended.

The gender dimension in research content should be considered, where relevant as well as the involvement of relevant stakeholders (e.g. clinical practitioners, patient organisations, etc.) from an early stage.

Specific objectives

Proposals submitted to this EIC Pathfinder Challenge should tackle the following specific objectives:

- o develop a novel technology (device, instrument or full system) for unobtrusive proactive healthcare. The targeted technology should offer life-long health status monitoring and elements of predictive medicine with methodologies grounded in existing scientific evidence;
- o the end objective must be a Proof-of-Concept and preliminary data suggestive of adequate safety and performance, while paying attention to minimising false positives that could hamper its real-world use;
- o the targeted technology should make the case for a clinically acceptable solution amenable to successful evaluation under common Health Technology Assessment (HTA) methodologies;
- o the path to future integration in the European healthcare workflow, specifically in relation to the inter-operability with existing infrastructures, as well as take up and compliance by appropriate patient populations, should be plausible.

Expected outcomes and impacts

The expected impact should be the establishment of the basis for the transformation of the prevailing episodic, symptom-triggered, healthcare system into continuous healthcare, in which individuals are accompanied continuously and unobtrusively by health monitoring technology and practitioners,

proactively offering diagnosis and treatment.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-04;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCode=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

5. /HORIZON EUROPE*/ Carbon dioxide and Nitrogen management and valorisation, deadline: 19. October 2022 17:00 Brussels time

Climate change, global warming and water/soil pollution are unprecedented challenges for the planet. To overcome them, it is necessary to develop breakthrough and integrated solutions to disrupt the current production processes and introduce more sustainable consumption habits.

Carbon dioxide (CO₂) and nitrogen (N) flows strongly affect climate change and belong to the cycle of make, use and dispose. To implement CO₂/N sustainable cycles there is the need to develop technologies, sustained by renewable energy, able to increase their cycle efficiency introducing novel management and valorisation practices and approaches.

This EIC Pathfinder Challenge aims at developing novel processes and technologies to enable CO₂ and N management/valorisation and in turn to reduce:

- o greenhouse gas (GHG) emissions,
- o nitrogen losses (mainly due to agricultural practices), so minimizing impact on soil and water,
- o carbon losses from the energy, industrial, agricultural, and livestock sectors.

These technologies could also increase cross sector coupling of energy systems, when renewable energy is required to capture, convert and use carbon and nitrogen streams into added value products.

This Challenge focuses on new biological, chemical, physical routes that integrate the capture and/or recovery of CO₂ and N species, storage and their conversion into value-added products, and/or net zero commodities, chemicals, fuels and energy vectors. The processes should focus on the use of renewable energy as input to develop carbon negative or net zero systems. Reaching these objectives requires multidisciplinary competencies and cross-sectorial approaches, with a strong focus on circularity and whole life analysis. The research could address in an integrated manner environmental, industrial, agricultural, socio-economic and logistic issues.

Specific objectives

The proposals, through non-critical raw materials (CRM)-based, systems integrated, life cycle and circular thinking driven approaches, should develop a proof of concept (PoC) or lab-scale validated innovative technology that, will manage and valorise CO₂, N, or both at the same time into value-added net zero commodities, chemicals, fuels, or energy vectors. Such technology should produce added-value products optimising input/output energy balances and achieving a carbon negative or net zero process promoting sustainable business models. Besides, the different steps of the CO₂/N management and valorisation process could be designed to achieve integration at system or process level, to maximize sector coupling of energy systems such as converting renewable electricity into e-fuels and materials (e.g. power to X).

Expected outcomes and impacts

This Challenge aims at developing:

- o a net zero carbon process involving conversion of CO₂ from various sources and streams into renewable fuels or net zero materials, using renewable energy as input. Such technology should involve CO₂ capture/conversion (directly from air or from flue gases streams, and through photosynthetic, biological, biophysical, or chemical processes), storage (e.g. through chemical, electrochemical, biogenic processes), and further valorisation (e.g. feedstock for chemical industry, high energy density fuels, energy carriers or

other carbon neutral compounds for industrial or agricultural applications). The CO₂ valorisation processes should be based on renewable energy and adopt technologies such as co-electrolysis of CO₂ and water, catalytic reduction of CO₂, or photoelectrochemical CO₂ conversion etc.;

o N integrated management cycle (nitrogen circular economy) to avoid or significantly reduce N release (e.g. from combustion, fertilizer, livestock, and wastewater) in conjunction with the conversion of N-compounds to inert N₂, or N-compounds recovery (e.g. using chemical, electrochemical, physical or biological systems), recycle and reuse as feedstock for added-value products or for biological fixation (e.g. into agriculture, as ammonia, as renewable fuels and energy vectors, as liquid hydrogen carriers).

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-01;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCode=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

6. /HORIZON EUROPE*/ Alternative approaches to Quantum Information Processing, Communication, and Sensing, deadline: 19. October 2022 17:00 Brussels time

The Quantum Flagship is currently focused on mainstream quantum technologies, in qubit implementation, sensors and other areas. Nevertheless, alternative implementations/platforms and so far, unexploited (controllable) quantum principles exist and could become key elements in future quantum systems. Such new implementations and principles could lead to breakthrough innovations and enable new players to offer unique solutions for the architecture and critical building blocks of new quantum systems. This could represent a significant opportunity for European researchers and companies in this competitive field.

The scope of this call is to develop innovative approaches to encoding, manipulating, or storing information in quantum objects, or to exploiting quantum phenomena for information processing, communication, and sensing in a way that differs from the mainstream approaches currently being pursued in quantum research. Proposals should clearly identify the limits of the current quantum information processing paradigms they are trying to improve upon and propose relevant metrics to track progress and demonstrate success or a superior paradigm compared with conventional quantum information processing approaches.

Specific objectives

The proposals under this EIC Pathfinder Challenge:

o are expected to contribute to the development of information processing, communication or sensing components, for terrestrial or space applications, exhibiting similar advantages to the mainstream quantum technology approaches, in terms of sensitivity, accuracy, energy efficiency, etc;

o should describe how their proposed information processing or communication system would be controlled and could lead to the development of an information processing or communication device using a non-classical information theory approach;

o should aim to show how information processing or communications principles and architectures would be developed that demonstrate a clear and quantifiable advantage with respect to classical approaches and mainstream quantum technology alternatives. This should be applicable to a class of relevant problems or applications;

o should show how the foundations for novel approaches to encoding, manipulating, and storing information that could lead to practical applications would be established. Such novel approaches could find their roots in, for example, new phases of matter, exotic physical systems, biological systems, or other approaches;

o should describe how the proposed information processing or communication system would be controlled, programmed, and measured and should address relevant interfacing aspects.

Expected outcomes and impacts

This EIC Pathfinder Challenge aims at the following:

- o technology breakthroughs that form the basis for future information processing, communication, and sensing technologies on ground and in space;
- o synergetic collaboration with existing European platforms, infrastructures, and innovation eco-systems in quantum technology;
- o increased diversity of information processing technologies platforms exploiting non-classical information theory approaches.

The activity must clearly achieve the proof of principle and validate the scientific basis of the breakthrough technology (TRL starting at 2 and reaching 3-4). Proposals are expected to demonstrate collaboration in order to create a critical mass of cooperation between EU research, industry and other relevant actors in the emerging area of quantum information processing. The overall goals are to enable new players to offer unique solutions as building blocks for new information processing or communication systems, and to foster the interdisciplinary communities and innovation eco-systems that are driving this forward.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-eic-2022-pathfinderchallenges-01-06;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCode=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;program=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicListKey=topicSearchTablePageState>

7. /HORIZON EUROPE*/ Expanding the European AI lighthouse (RIA), deadline: 16. November 2022 17:00 Brussels time

To ensure European open strategic autonomy in critical technology such as AI, with huge potential socio-economic impact, it is essential to reinforce and build on Europe's assets in such technologies, including its world-class researcher community, in order to stay at the forefront of technological developments.

As stated in the communication from the European Commission on Artificial Intelligence for Europe and the coordinated action plan between the European Commission and the Member States, while Europe has undeniable strengths with its many leading research centres, efforts are scattered. Therefore joining forces will be crucial to be competitive at international level. Europe has to scale up existing research capacities and reach a critical mass through cross-community networks of European excellence centres in AI. Proposals should develop mechanisms to reinforce and strengthen the networks of excellence centres in AI. They are expected to bring the best scientists from academia and industry together to join forces in addressing the major AI challenges hampering its deployment, and to reinforce excellence in AI throughout Europe via a tightly-coupled network of collaboration.

Such networks are expected to mobilise select groups of key researchers from both industry and academia to collaborate on solving significant AI problems in which Europe has exceptional expertise. The networks are expected to increase the impact of the funding by making faster and greater progress through the joint efforts by recognised leaders working together, drawing on both shared and complementary perspectives, such as reasoning and learning, on the chosen problems. Such networks, together with other mechanisms, will play an important role in achieving a critical mass of talent and in overcoming the present fragmentation of AI research in Europe.

Proposals will mobilise the best European teams in AI community to join forces to address major technical as well as sector- or societal-driven challenges: strengthening excellence, networking, multidisciplinary,

academia-industry synergies.

This initiative contributes to the initiative started in H2020 to develop a vibrant European network of excellence centres in AI, and a vibrant AI scientific community, and continued in the first call of Horizon Europe. To complement and extend this initiative the proposals should create a network of excellence for the following topics:

1. Next Generation AI - covering foundational research and emerging and novel approaches, with a view of improving the technical performances of AI-based systems, such as increased accuracy, robustness, verifiability, dependability, adaptability, versatility, graceful degradation, etc. Research is also expected to address functional and performance guarantees. Aspects to be covered include, but are not limited to: foundational research in artificial intelligence and machine learning including new paradigms, algorithms, architectures and novel optimization and regularization methods, hybrid AI, hybrid machine learning, data/sample -efficiency.
2. Scientific research and technologies prioritised in the latest SRIDA (Strategic Research, Innovation and Deployment Agenda of the AI, Data and Robotics PPP) , and complementing the previously selected Networks of Excellence centres (either in H2020-ICT48, or the first calls for Networks of Excellence Centres in Horizon Europe).

Proposals will need to demonstrate how they complement, intend to expand and maximise the coverage of the previously selected[2] networks of excellence centres in AI.

To develop the lighthouse the selected networks should identify the major strength Europe has on a number of specific AI topics, and gather the best teams working on them in Europe in a strongly connected virtual institute, collaborating and competing to progress on these topics. They might also identify topics where Europe needs support to become competitive at international level, if strategically important.

Each network should set ambitious challenges, with the overarching aim of becoming a world reference of excellence in AI on the strategic topics prioritised by the Network. As a result, Europe's diversity will stimulate healthy competition, rather than the fragmentation of the AI community.

The scientific progress should be driven by major societal challenges, which will serve as a source of research questions. This should also make it attractive for industries to join the efforts, in bringing their top research teams in the network, and also provide data/challenges that can become reference to drive scientific progress.

Composition of the Networks:

o Proposals should be driven by leading researchers in AI and AI relevant technologies from major excellent AI research centres, and bringing the best scientists across Europe, including also from promising research labs. They will bring on board the necessary level of expertise and variety of disciplines and profiles to achieve their objectives, ensuring a multidisciplinary and multi-sectorial research approach, while respecting equality and diversity among the attracted talents.

Activities of the Networks:

o In order to structure the activities, the proposals will focus on important scientific or technological challenges with industrial and societal relevance where Europe will make a difference, by building on existing strengths, or increasing strength in areas that are critical for Europe.

o Based on the identified challenges, the networks should develop and implement common research agendas. The main vision and roadmap with clear targets, as well as methodology to implement and monitor progress will have to be specified in the proposal and can be further developed during the project.

o Scientific progress will have to be demonstrated through testing on application specific datasets or use-cases that characterise a demonstrated need of individuals or society as a whole. By extending the benchmarking of foundational research to application specific areas, the research community will simultaneously address advancements in AI and grand societal and technological challenges.

o The networks should define mechanisms to foster excellence throughout Europe, to increase efficiency of collaboration, including through networking and exchange programmes, and to develop a vibrant AI network in Europe.

o The networks are expected to disseminate the latest and most advanced knowledge to all the academic and industrial AI laboratories in Europe and involving them in collaborative projects/exchange

programmes. (This could involve projects defined initially or via financial support to third parties, for maximum 20% of the requested EU contribution, with a maximum of 60k€ per third party[3]).

- o Furthermore, it is key that each network provides a dissemination plan on how it intends to promote uptake by disseminating resources, e.g. datasets, software, or toolkits that are required to replicate and validate any experiments that gave rise to this knowledge.

- o The networks should develop interactions with the industry, in view of triggering new scientific questions and fostering take-up of scientific advances

- o The networks will develop collaboration with the AI-on-Demand platform, the AI, Data and Robotics Partnership and with relevant Digital innovation Hubs and AI start-up initiatives, to disseminate knowledge and tools, and understand their needs.

- o The networks should also foster innovation and include mechanisms to exploit new ideas coming out of the networks' work (for instance via incubators).

- o Overall, each network will define mechanisms to become a virtual centre of excellence, offering access to knowledge and serve as a reference in its chosen specific field, including activities to ensure visibility.

The proposals should

- o include mechanisms to spread the latest and most advanced knowledge to all the AI-labs in Europe

- o develop synergies and cross-fertilization between industry, academia and civil society.

- o become a common resource and shared facility, as a virtual laboratory offering access to knowledge and expertise and attracting talents

- o provide broad access to AI excellence in Europe and also play an important role in increasing visibility

- o provide access to the required resources and infrastructure to support the R&D activities of the action, such as cloud and computing capacity, IoT, robotics equipment, support staff and engineers, where relevant, and the capacity to develop prototypes, pilots, demonstrators, etc.

- o include a number of major scientific and application challenges which will mobilise the community to join forces in addressing them. Continuous evaluation and demonstration of scientific and technological progress (with qualitative and quantitative KPIs, benchmarking and progress monitoring processes)

towards solving the targeted challenges will motivate the entire network and support publications and scientific career developments (providing reference benchmarks to publish comparative results, using the reference data, scenarios, etc.), and also showcase the technology in application contexts, to attract more user industries and foster take up and adoption of the technology.

- o include mechanisms to share resources, knowledge, tools, modules, software, results, expertise, and make equipment/infrastructure available to scientists to optimise the scientific and technological progress.

To that end, proposals should exploit tools such as the AI-on-demand platform[4] and further develop and expand the platform, to support the network and sharing of resource, results, tools among the scientific community, maximising re-use of results, and supporting faster progress. Mechanisms to test results and continuously measure and demonstrate progress should be integrated in the platform, which is also important to support the scientific community, allowing also for comparative analysis. Openness and interoperability of components are encouraged to develop synergies and cross-fertilization between different approaches and solutions (e.g. through modularity of components or open interfaces)

- o include collaboration mechanisms among the best AI and AI-relevant research teams, but also mechanisms to bring all European AI teams to the highest level of excellence. This is also in view of supporting and encouraging the adoption of AI technologies in all Member States and Associated Countries, with particular emphasis on geographical aspect and elimination of gaps between Member States/Associated Countries, as well as addressing existing gender disparities.

- o exploit and develop technology enablers, such as methodologies, tools and systems and exploit latest hardware development and data spaces, cloud and HPC resources.

The networks will also address a number of sector- or societally-driven challenges, mobilising the community towards achieving common goals in addressing such challenges that AI can help overcome, demonstrating the positive impact on the society, economy and environment.

Activities are expected to achieve TRL 4-5 by the end of the project.

Proposals are expected to develop synergies:

- o With other Networks of excellence centres in AI funded in H2020 or Horizon Europe, with a view of, all together, create vibrant European network of AI excellence centres. To that end, the activities should

integrate with and complement the activities of the H2020-ICT-48 projects. The proposals are expected to dedicate tasks to ensure this coherence.

o With relevant activities in AI, Data and Robotics, primarily under destinations 3, 4 and 6, but also in other destinations and clusters, as well as relevant missions, and share or exploit results where appropriate. All proposals are expected to allocate tasks to cohesion activities with the PPP on AI, Data and Robotics and funded actions related to this partnership, including the CSA HORIZON-CL4-2021-HUMAN-01-02.

Background

The selected networks of excellence centres will contribute to the larger objective of the European Commission to establish the European AI lighthouse.

The AI lighthouse is expected to mobilise the AI community to collaborate on key AI research challenges and to progress faster in joined efforts rather than working in silos, leading to fragmented and duplicated efforts. This is essential to reach critical mass and overcome the present fragmentation of AI research in Europe.

The lighthouse will bring together stakeholders from research, innovation and deployment, to become a world reference in AI that can attract investments and the best talents in the field. The lighthouse will build on key pillars, each of them being a network of excellence centres specialising in a given topic where Europe has the potential to become a global champion.

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2022-human-02-02;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

8. /HORIZON EUROPE*/ AI for human empowerment (AI, Data and Robotics Partnership) (RIA), deadline: 16. November 2022 17:00 Brussels time

ExpectedOutcome:

Proposal results are expected to contribute to at least one of the following expected outcomes:

- o Truly mixed human-AI initiatives for human empowerment
- o Trustworthy hybrid decision-support systems

Scope:

Build the next level of perception, visualisation, interaction and collaboration between humans and AI systems working together as partners to achieve common goals, sharing mutual understanding and learning of each other's abilities and respective roles.

Innovative and promising approaches are encouraged, including human-in the loop approaches for truly mixed human-AI initiatives combining the best of human and machine knowledge and capabilities, tacit knowledge extraction (to design the next generation AI-driven co-creation and collaboration tools embodied e.g. in industrial/working spaces environments).

Each proposal will exclusively focus on one of the two following research objectives, and must clearly identify its focus in the proposal:

1. Reach truly mixed human-AI initiatives for human empowerment. The approaches should combine the best of human and machine knowledge and capabilities including shared and sliding autonomy in interaction, addressing reactivity, and fluidity of interaction and making systems transparent, fair and intuitive to use, which will play a key role in acceptance. The systems should adapt to the user rather than the opposite, based on analysis, understanding and anticipation about human behaviour and expectations.

2. Trustworthy hybrid decision-support, including approaches for mixed and sliding decision-making, for context interpretation, for dealing with uncertainty, transparent anticipation, reliability, human-centric planning and decision-making, interdependencies, and augmented decision-making. Transparency, fairness, technical accuracy and robustness will be the key, together with validation strategies assessing also the quality of the decision of the AI supported socio-technical system.

All proposals should adopt a human-centred development of trustworthy AI and investigate and optimise ways of human-AI interaction, key for acceptance and democratisation of AI, to allow any user to take full advantage of the huge benefits such technology can offer, regardless of their age, race, gender or capabilities. This includes development of methods to improve transparency, in particular for human users, in terms of explainability, expected levels of performance which are guaranteed/verifiable and corresponding confidence levels, accountability and responsibility, as well as perceived trust and fairness. AI could also be used to empower humans in supporting them to improve responsible behaviours, where appropriate, but this should be done in full respect of the requirements ensuring trustworthy AI, including human autonomy.

Innovative scientific approach towards human-centric approaches will require multidisciplinary and trans-disciplinary approaches paying particular attention to intersectional factors (gender, ethnicity, age, socioeconomic status, disability) including SSH[1] and other disciplines relevant to stimulate novel research avenues, and eventually improve user-acceptance. Collaborative design and evaluation with users involvement should also be considered

As a pilot activity, proposals in this topic will dedicate part of their activities on investigating novel ways of engagement by citizens or citizen representatives with AI development, with a view of optimising experience towards improving usability and experience for citizens (both at professional or daily life environment).

All proposals should contribute to build the next level of perception, visualisation, interaction and collaboration, and understanding between humans and AI systems working together as partners to achieve common goals, sharing mutual understanding of each other's abilities and respective roles.

All proposals are expected to embed mechanisms to assess and demonstrate progress (with qualitative and quantitative KPIs, benchmarking and progress monitoring, as well as illustrative application use-cases demonstrating concrete potential added value), and share results with the European R&D community, through the AI-on-demand platform[2], a public community resource, to maximise re-use of results, either by developers, or for uptake, and optimise efficiency of funding. Activities are expected to achieve TRL 4-5 by the end of the project.

This topic implements the co-programmed European Partnership on AI, Data and Robotics.

All proposals are expected to allocate tasks to cohesion activities with the PPP on AI, Data and Robotics and funded actions related to this partnership, including the CSA HORIZON-CL4-2021-HUMAN-01-02.

Specific Topic Conditions:

Activities are expected to start at TRL 2-3 and achieve TRL 4-5 by the end of the project - see General Annex B.

Cross-cutting Priorities:

Artificial Intelligence

Digital Agenda

Social sciences and humanities

Co-programmed European Partnerships

[1]Social Sciences and Humanities

[2]Initiated under the AI4EU project <https://cordis.europa.eu/project/id/825619> and further developed in projects resulting from H2020-ICT-49-2020 call

Further Information:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl4-2022-human-02-01;callCode=null;freeTextSearchKeyword=;matchWholeText=true;typeCodes=1,2,8;statusCodes=31094502;programmePeriod=2021%20-%202027;programCcm2Id=43108390;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=startDate;orderBy=asc;onlyTenders=false;topicListKey=topicSearchTablePageState>

9. /Sonstige*/ H2020-INNOSUP-1, deadline: 30. June 2022 17:00 Brussels Time

H2020-INNOSUP-1 project AMULET has published its first open call for cascade funding for SMEs, with a budget of 1.277 M euros.

The goal of AMULET is to create new value chains through projects that will foster the penetration of advanced lightweight materials in four sectors: automotive, aerospace & aeronautics, energy, and building.

Projects should be submitted by consortia of minimum 2 SMEs (from EU 27 and H2020 associate countries) and address one of the challenges pre-identified by AMULET.

With this 1st call, AMULET will select up to 36 projects invited to a Jury Day, from which up to 26 will pass to the AMULET programme support services, and out of them, up to 7 will complete the full programme, following a funnel approach:

- up to 26 consortia (2-3 SMEs) to submit a feasibility study: 23,000 €
- up to 7 consortia (2-3 SMEs) to demonstrate their solutions: 80,000 €
- up to 7 consortia (2-3 SMEs) to get follow-up support services: 17,000 €

Further information:

<https://amulet-h2020.fundingbox.com/>

10. /HORIZON Europe/, Cost Aufruf Deadline: 20.October 2022 12:00 Central European Time

Participants are invited to submit COST Action proposals contributing to the scientific, technological, economic, cultural or societal knowledge advancement and development of Europe. Multi- and interdisciplinary proposals are encouraged.

The Open Call Action proposal submission, evaluation, selection and approval (SESA) procedure is fully science and technology-driven and will ensure a simple, transparent and competitive proposal evaluation and selection process, reflecting the bottom-up, open and inclusive principles of COST.

Participants planning to submit a proposal for a COST Action will need to refer to the SESA guidelines and to the Open Call Announcement on the Documents and Guidelines page.

Further Information:

Open Call: A Simple One-Step Application Process | COST

11. /Deutsche Krebshilfe e. V./ Operative Surgical Research, deadline: 18. July 2022, 1. Phase

German Cancer Aid announces a new call for proposals to fund operative surgical projects that have the potential to further improve surgical procedures in cancer treatment, leading to more effective therapies, improved quality of life, and reduction of unwanted side effects. Applications are invited for hypothesis-driven, surgically and operationally oriented scientific projects with a duration of up to 3 years. Possible topics include navigation, robotics, new surgical techniques, functional preservation and molecular methods for surgical treatment planning. Purely observational studies of existing technological solutions are not eligible for funding.

Applications are not accepted from members of profit-oriented organizations or from persons who are not permitted allowed to publish results in a generally accessible form. The project outlines and applications submitted will be evaluated by an international committee of experts. For this reason, all project outlines and applications must be in English. Title, Summary, and Financial Plan have to be submitted also in German. Please use the section numbers as below with the corresponding titles. The requirements for Letters of Intent and project outline are described in detail in the following sections. Please do not exceed page limits.

The application and evaluation procedure takes place in three steps:

- Applicants must inform German Cancer Aid by July 18, 2022 that they plan to submit an application (Letter of Intent, LOI).
- Project outlines must be submitted no later than August 19, 2022.
- If the preliminary evaluation is favorable, full applications must be submitted by November 30, 2022.

Further Information:

<https://www.krebshilfe.de/forschen/foerderung/ausschreibungen/>

12. /European Cluster Collaboration Platform/ Call for Expression of Interest - Clusters meet Regions, deadline: 29. July 2022 18:00 Brussels time

The ECCP is launching a Call of Expression of Interest to select the national/regional authorities and clusters organisations to run each of these important events.

At our 'Clusters meet Regions' events, national and regional clusters and policymakers come together to share experiences, secure new partnerships and to learn from one another how we can all make better use of clusters to:

- strengthen our industrial ecosystems,
- address disruptions in our supply chains,
- drive the green and digital transition, and
- build resilience in our regions.

The Clusters meet Regions events also provide opportunities for our clusters community to discuss national and regional economic development and liaise with other regions facing transition challenges similar to their own.

Each workshop must be designed to be beneficial for cluster managers and policy makers, with the ultimate objective of ensuring that clusters are central to the process of putting the European Union's regional economic, business and social goals into action.

Further information:

<https://clustercollaboration.eu/content/call-expression-interest-clusters-meet-regions>

13. /Sonstige*/ GALATEA- THE BLUE GROWTH ACCELERATOR - Call for Services, deadline: 30. September 2022 17:00 Brussels time

The coaching services, operated by GALATEA partners aims to facilitate and support SMEs to carry out their innovation and scale-up activities. SMEs can apply individually to get support on:

- Service#1 Business model elaboration: Support on business model assessment to ensure proper planning set, alignment with market requirements and conditions, etc.
- Service#2 Technology expertise: Support on technology potential for given markets
- Service#3 Internationalisation: Support on international diffusion of beneficiary/ solution to develop new business, to participate in matchmaking sessions and implement actions to maximise collaborations.
- Service#4 Funding Opportunities: Support on exploring funding opportunities suitable to the SMEs' mission and needs and on developing and submitting proposals to funding schemes.

The total number of Services planned is 70 and may be provided in various forms, such as individual meetings, one or more sessions, webinars, collectives meetings, etc. at an average estimation of 4 working days/ service and no less than 1 working day/ service. The Services will be provided from June 2021 until January 2023.

Applicants must either be:

- innovative SMEs from the Maritime (port, ship, shipyard, maritime surveillance), ICT, Aeronautic, Aerospace sectors wishing to submit proposals related to Blue Growth or
- members of one of the GALATEA consortium clusters or established or with a branch office in the GALATEA territorial scope (France; Greece; Poland; Romania and Spain)

Further information:

<https://galateaproject.eu/innovation-support-call/>

14. /Sonstige/ Contact Research Funding Advice of the Otto von Guericke University Magdeburg

For questions about funding opportunities, specific calls for proposals, help with submitting applications and project support, please contact the department for Research Funding Advice/EU-University Network of Otto von Guericke University Magdeburg.

Information on current events, funding structures and contact online at:

<https://www.ovgu.de/en/ContactResearchFundingAdvice>

<https://www.euhoerschulnetz-sachsen-anhalt.de/en/>
