HORIZONT EURÓPA – 5. KLASZTER: ENERGIA

2023 ŐSZI PÁLYÁZATI FELHÍVÁSOK

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Nemzeti Kutatási, Fejlesztési
és Innovációs Hivatal

Határidők

- Nyitva: 2023.szeptember 12. -**2024. január 16.**
- Eredmény hirdetés: hozzávetőlegesen 5 hónap
- Szerződéskötés: hozzávetőlegesen 3 hónap
- Projekt időtartam: a támogatási szerződésben rögzítve, csak kivételesen és indokolt esetben hosszabbítható meg

Támogatott területek

- Photovoltaics PV
- CO2 (CCU)
- Geothermal Technologies
- Heating and cooling in industry
- Hydro power Production
- Hydrogen
- Energy carrier technology
- Next generation energy
- System management and storage
- Software tools, AI testing, DC and AC/DC
- Africa EU Co-fund

Felhívások (17)

- HORIZON –CL5-2024-D3-01-01: Alternative equipment and processes for advanced manufacturing of PV technologies
- HORIZON –CL5-2024-03-01-02: Low –power PV
- HORIZON-CL5-2024-D3-01-03: Demonstration of improved intermediate renewable energy carrier technologies for transport fuels
- HORIZON –CL5-2024-D3-01-04: Improvement of light harvesting and carbon fixation with synthetic biology ansd or bio-inspired /biomimetic pathways for renewable direct solar fuels production
- HORIZON-CL5-2024-D3-01-05: Development of carbon fixation technologies for biogenic flue gases
- HORIZON-CL5-2024-D3-01-06: Innovative applicaqtions/integration of geothermal heating and cooling in industry
- HORIZO –CL5-2024-D3-01-07: Development of hydropower equipment for improving techno-economic efficency resilience in refurbished situations
- HORIZON –CL5-2024-D3-01-08: Demonstration of sustainable wave energy farms

Felhívások (folytatás)

HORIZON –CL5-2024-D3-01-09: Africa- EU co-fund action

HORIZON –CL5-2024-D3-01-10: Next generation of renewable energy technologies

HORIZON –CL5-2024-D3-01-11: AI Testing and experimentation Facility for the energy sector- bringing technology to the market

HORIZON –CL5-2024-D3-01-12: Energy Management System for flexibility services

HORIZON –CL5-2024-D3-01-13: DC and AC/DC hybird transmission and distribution systems

HORIZON –CL5-2024-D3-01-14: Condition and Health Monitoring in Power Electronics

(PE) – Wide Band Gap PE for the energy sector

HORIZON –CL5-2024-D3-01-15: HVDA, HVDC and High Power cable systems

HORIZON –CL5-2024-D3-01-16: Demonstration of innovative pumped storage equipment and

tools in combination with innovative storage managment systems

HORIZON –CL5-2024-D3-01-17: Development and integration of advanced software tools

in SCAD Systems for High, Medium, Low voltage AC/DC hybrid systems

A felhívások struktúrája

- **Budget (2024):** ammount (pályázható alap) (pl. 13 000 000), contribution/project (hozzávetőleges támogatás projektenként) (40 000 000), projects expected to be funded/támogatandó pályázatok száma (3). Általában 2-3 támogatás/felhívás (lump sum –egyes esetekben); van viszont olyan is, ahol 9 a támogatott projektek száma
- **Deadline model**: single stage (egylépcsős)
- **Topic destionation**: (a) biztonságos, versenyképes, fenntartható energia ellátás, (b) energia rendszerek, hálózatok, tárolás
- **Expected outcome**: konkrét célok megvalósítása a projekt végén.
- **Scope**: a felhívás tudományos-szakmai háttere, a state of the art; gyakran az is, hogy mi nem tartozik a felhívás céljaihoz; az elvárt technológiai fejlettségi szint(TRL), esetleges kapcsolódás más korábbi felhívásokhoz, SDGs (fenntarthatósági célok).
- **IA/RIA, TRL** : az elvárt kutatásfeljesztési tevékenység típusa; a technológiai fejlettségi szint a projekt végén
- **Eligibility conditions:** General Annex B.
- **Legal and financial set up:** General Annex G

HORIZON-CL5-2024-D3-01-01:

Alternative equipment and processes for advanced manufacturing of PV technologies

Innovation Action | TRL **7** | 24M EUR/project | 2 to be funded | Opening: 12 Sept 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-search?keywords=HORIZON-CL5-2024-D3-01-01

Különleges kihívás, amit a felhívás megcéloz: **elérhetőség, biztonság, fenntarthatóság, hatékonyság növelése a teljes ellátási láncon belül**

Expected outcome: project results are expected to contribute to all of the following outcomes:
1.Contribute towards establishing a solid European PV innovation and production base.
2.Reduce the CAPEX and OPEX in the PV solar production chain, ultimately leading to cheaper modules and lower LCOE.
3.Reinforce the sustainability of the European PV value chain building a secure, resilient, and diverse domestic energy sector industrial base.

Scope:
Proposals are expected to:
- **Demonstrate alternative processes and equipment** for PV manufacturing with reduced CAPEX, OPEX, energy and material consumption and implement Industry 4.0 concepts.
- **Increase the productivity and sustainability of large-scale PV manufacturing equipment and processing,** for example by the enhancement of: i) throughput (e.g. wafers or roll area /time or module area/time) ii) yield (process & quality control) iii) availability (e.g. optimisation of uptime & service time) and iv) quality control.
- **Involve multidisciplinary consortia including industrial partners.** A plan for the exploitation and dissemination of results should include a strong business case and sound exploitation strategy, as outlined in the introduction to this Destination.

The exploitation plan should include preliminary **plans for scalability, commercialisation**, and **deployment** (feasibility study, business plan**) indicating the possible funding sources to be potentially used (in particular the Innovation Fund).**

HORIZON-CL5-2024-D3-01-02:

Low-power PV

Innovation Action | TRL 5-7| 6M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024 **(lump sum)**

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-search?keywords=HORIZON-CL5-2024-D3-01-02

- Különleges kihívás, amit a felhívás megcéloz: **környezeti energia hasznosítása alacsony fényviszonyok között mint belső terek, mesterséges vagy diffúz fény viszonyok.**

Expected outcome: project results are expected to contribute to the increase the potential of PV for low power, low irradiation applications (harvesting energy in low light intensity and/or artificial light conditions).

Proposals are expected: to validate **novel and low-environmental impact** PV materials, PV architectures and suitable substrates for the **specific low power applications** that take into account the **light intensity, light spectrum and application** itself. PV system performance is expected to be tailored to **meet the application-specific power** and **energy requirements and application – related standards**.

Proposals should include a **clear definition of the use case** and **lifecycle considerations**, e.g. **business models, circularity by design aspects, certification, etc.**

Applicants can seek possibilities of involving the EC JRC. The JRC may **provide characterisation, validation and certification of the performance of photovoltaic solar devices.** It may also perform pre-normative research to develop appropriate characterisation methods for such devices **as a precursor to the adoption of international standards as well as addressing stability, lifetime and environmental issues.** This task shall be performed within the European Solar Test Installation (ESTI) an accredited ISO17025 calibration laboratory for all photovoltaic technologies.

HORIZON-CL5-2024-D3-01-03:

Demonstration of improved intermediate renewable energy carrier technologies for transport fuels

Innovation Action | TRL 6-7 | 20M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024 **(lump sum)**

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-search?keywords=HORIZON-CL5-2024-D3-01-03

- Különleges kihívás, amit a felhívás megcéloz: **közvetítő energiahordozó technológiák demonstrálása, amelyek alacsony költségen és alacsony környezeti terhelés mellett képesek bioenergia és szintetikus megújuló energiahordozók előállítására biogenikus hulladékból, mikroalgából, biogenikus CO2-ból vagy nitrogénből (túlmenően a tudomány és technológia jelenlegi lehetőségein)**

Scope: Demonstration of technologies for the production of advanced intermediate bioenergy and synthetic renewable energy carriers from biogenic residues and wastes, microalgae, biogenic CO, CO2 or nitrogen and renewable hydrogen and all forms of renewable energy with reduced cost and GHG emissions above the state of the art.

Proposals are expected to demonstrate that conversion technologies have already reached pilot scale TRL 5. The finished quality is expected to be suitable so that the intermediates can be either directly upgraded in existing refinery infrastructures and/or further purified and processed in existing chemical infrastructures to drop-in liquid and gaseous advanced biofuels and synthetic renewable fuels, or directly used for shipping propulsion or in other off-road transport.

Examples are demonstration of production of bio-oils, raw alcohols, bio-liquids, biogas, syngas and thermally pre-treated solid biomass fuels from biogenic residues and wastes and microalgae oils through chemical, biochemical, thermochemical, biological, electrochemical pathways, as well as synthetic renewable analogues. The integration of these intermediates in transport and their application in hard to electrify transport sectors should be presented.

The sustainability and GHG reduction should be addressed on a life-cycle assessment basis. Proposals should provide information and assessment about the economic feasibility and the potential of scaling-up the technology at commercial scale as appropriate. The exploitation plans should include preliminary feasibility study and business plan also indicating the possible funding sources to be potentially used (such as private equity, the InvestEU, the EU Catalyst Partnership and the Innovation Fund)

HORIZON-CL5-2024-D3-01-03:

Demonstration of improved intermediate renewable energy carrier technologies for transport fuels

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Expected Outcome: Project results are expected to contribute **to all of the following** expected outcomes: Support **de-risking** the technology**, boost scale-up** of flexible intermediate bioenergy and synthetic renewable energy carriers and contribute to their **market up-take**. Respond to short- and medium-term needs for **renewable fuels in transport**. **Increase flexibility, reliability and security** of renewable **energy supply** in the transport sector. Increase available options for **better integration of the energy system** linking renewable energy production, storage and use **via renewable energy intermediates.**

HORIZON-CL5-2024-D3-01-04:

Improvement of light harvesting and carbon fixation with synthetic biology and/or bio-inspired//biomimetic pathways for renewable direct solar fuels production

Research and Innovation Action | TRL 3-4 | 8M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon?keywords=HORIZON-CL5-2024-D3-01-04

- Különleges kihívás, amit a felhívás megcéloz: **szolár üzemanyag új in –vivo vagy in –vitro biokémiai vagy és bio-alapú/biomimetikus módszerrel történő előállítása fokozott hatékonyság mellett**

Scope: Development of **novel in-vivo or in-vitro biochemical and/or bio-inspired/biomimetic pathways** for solar fuel production **with increased efficiency** in comparison to light and dark reactions of natural photosynthesis by synthetic biological and/or bio-inspired/biomimetic approaches. The aim is to achieve a significant improvement of components of both, light harvesting and carbon fixation, which are rate limiting for the conversion of solar energy to renewable fuels.

Proposals are expected to include **case studies** for analysing the potential and impact of the technology for future application at scale and possible interfaces with other solar fuel technologies, **with a particular focus on socioeconomic and environmental sustainability, including circular economy, social, economic and environmental aspects** and **cost-effectiveness**. All relevant aspects of **safety of the technology** are expected to be addressed.

Hydrogen as a fuel and end-product is excluded.

HORIZON-CL5-2024-D3-01-04:

Improvement of light harvesting and carbon fixation with synthetic biology and/or bio-inspired//biomimetic pathways for renewable direct solar fuels production

Research and Innovation Action | TRL 3-4 | 8M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-keywords=HORIZON-CL5-2024-D3-01-04

Expected Outcome: Project results are expected to contribute to at least 3 of the following expected outcomes: Availability of **disruptive and sustainable solar fuel technologies** in order to accelerate the replacement of fossil-based energy technologies with more efficient use of primary solar energy in solar fuel production. **Reduced cost and improved efficiency** of solar-based renewable fuel technologies and their value chains by addressing rate-limiting steps in the solar fuels value chain. **Increase technology leadership, competitiveness and technology export** potential of European industry in possibly game-changing solar fuel and synthetic biological technologies. **Enhanced sustainability** of solar fuels, **taking fully into account circular economy, social, economic and environmental aspects** in line with the European Green Deal priorities. Reinforced European scientific basis and European export potential for renewable energy technologies through **international collaborations** (e.g., the AU-EU Climate Change and Sustainable Energy partnership, the missions and innovation communities of Mission Innovation 2.0). Increasing the **European energy security and reliability** by **improving the solar fuel conversion efficiency** as well as maintaining and fostering the European global leadership in affordable, secure and sustainable solar fuel technologies.

HORIZON-CL5-2024-D3-01-05:

Development of carbon fixation technologies for biogenic flue gases

Research and Innovation Action | TRL 5 | 8M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-?keywords=HORIZON-CL5-2024-D3-01-05

- Különleges kihívás, amit a felhívás megcéloz: **széndioxid megkötő biológiai és kémiai technológiák kidolgozása biogenikus gázokra, megújuló energiahordozók termelésére megújuló hidrogén segítségével, amely később újrahasznosítható mint energia alapanyag a szén körforgás megvalósításában.**

Scope: Development of biological and chemical solutions to use the effluent gases from bioenergy combustion systems and upgrade biogenic carbon emissions for the production of renewable energy carriers with renewable hydrogen for later reuse as feedstock for energy needs and achieving carbon circularity. This requires system components (e.g. catalysts), which are cost-effective and robust to flue gas toxicity and interface with the underlying bioenergy combustion system without compromising system performance in respect of technical efficiency and sustainability. The effluent fixing solution has to be implemented in the conditions of the bioenergy combustion system and provide an integrated structure at the TRL requested.

The reuse of the biogenic emissions should be addressed. The assessment of the combustion gas upgrading should be done at **pilot scale and cost analysis** of how this is a beneficial carbon capture and use solution should be provided. **Socio-economic aspects including SDGs** and **impacts** when applying such solutions **in regions in transition from coal or other fossil fuels** should be **analysed and illustrated in the proposal**.

HORIZON-CL5-2024-D3-01-05:

Development of carbon fixation technologies for biogenic flue gases

Research and Innovation Action | TRL 5 | 8M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-?keywords=HORIZON-CL5-2024-D3-01-05

- Expected Outcome: Project results are expected to contribute to all of the following expected outcomes:
- Availability of **disruptive sustainable bioenergy technologies with negative carbon dioxide emissions**.
- **Increase technology leadership, competitiveness and technology export** potential of European industry.
- **Reduced cost and improved efficiency** of sustainable bioenergy technologies and their value chains.
- Enhanced sustainability of bioenergy, taking fully into account **circular economy, social, economic and environmental** aspects in line with the European Green Deal priorities.

HORIZON-CL5-2024-D3-01-06:

Innovative applications/integration of geothermal heating and cooling in industry

Research Innovation Action | TRL 5 | 9M EUR/project | 3 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-?keywords=HORIZON-CL5-2024-D3-01-06

- Különleges kihívás, amit a felhívás megcéloz: **új fűtési és/vagy hűtési megoldások feltárása az ipar számára a termelés szénmentesítése érdekében.**

Scope: Based on geothermal energy, the following is expected to be achieved: explore new heating and/or cooling concepts for industrial sectors which have to decarbonise their production lines using renewable systems. **Enable the smart use of thermal grids** with emphasis on flexible supply of resources, **adapted to different source temperatures** and **varying demand**; and position **geothermal utilisation (including underground storage) as a crucial pillar** for the (heat and/or cold) transition of industrial energy systems.

Projects should consider the application of cascading residual geothermal waste heat to neighbouring industries or the built environment and should include the integration of geothermal and heat pump systems, energy piles, or energy sheet pile walls, consider the use of alternative cycle working media.

Activities related to **geothermal heat for industry** and **agriculture**, **underground thermal energy storage** (UTES) including high-temperature storage, **innovative and multiple uses for geothermal energy** and **side-products**, **balneological systems**, and design and operation of **geothermal doublets can be considered.**

Activities **are required to assess the environmental sustainability** of geothermal heating and/or cooling applications. The applied technologies should not significantly harm the environment (**Do No Significant Harm principle**). It must be ensured that negative impacts on ecosystems and biodiversity, including negative impacts on (or pollution affecting) air, water or soil quality, are addressed through mitigation policies.

HORIZON-CL5-2024-D3-01-06:

Innovative applications/integration of geothermal heating and cooling in industry

Research Innovation Action | TRL 5 | 9M EUR/project | 3 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-?keywords=HORIZON-CL5-2024-D3-01-06

- **Expected Outcome:**

Project results are expected to contribute to all of the following expected outcomes:

- High integration of geothermal heating and/or cooling in different industry sectors with **operation flexibility** considering start-up time and ramp-up rate, and maximum cascaded use of thermal energy.
- **Increased** industry, region, city and citizen **trust and acceptability** for geothermal energy.

HORIZON-CL5-2024-D3-01-07:

Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations

Research and Innovation Action | TRL 4-5 | 4M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-?keywords=HORIZON-CL5-2024-D3-01-07

- Különleges kihívás, amit a felhívás megcéloz: **új technológiák, amelyek javítják a felújítás alatt álló vízerőművek hatékonysági és gazdasági paramétereit a hidraulikai rendszer lényeges átalakítása nélkül, figyelembe véve a körforgásosság követelményeit**.

Scope: Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations of existing hydropower plants, which are outdated in respect of efficiency, power market interfacing, climate change adaptation and environmental sustainability, in particular also in respect of biodiversity.

In scope are novel technologies, which improve the efficiency and economic parameters of existing hydropower plants during refurbishment **without requiring substantial modification of the hydraulic system** and **by implementing circularity by design**, **e.g., low-friction and resistant materials and technical solutions that can minimize tear and wear in future operation modes.**

Solution should **positively affect CAPEX and OPEX** per kWh and also be **compliant with improving the water quality** of the underlying water body and in particular **positively affect biodiversity. Socio-economic and environmental sustainability including SDGs, circular economy, social, economic and environmental aspects** should be addressed on a life cycle basis.

HORIZON-CL5-2024-D3-01-07:

Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations

Research and Innovation Action | TRL 4-5 | 4M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon?keywords=HORIZON-CL5-2024-D3-01-07

- Expected Outcome:

Project results are expected to contribute to at all of the following expected outcomes:

- Keeping the availability of the existing hydropower fleet with an important role in the future power market as flexible power suppliers.
- **Increase technology leadership, competitiveness and technology export** potential of European hydropower industry.
- **Reduced cost and improved efficiency of refurbished hydropower installations**.
- **Enhanced sustainability** of refurbished hydropower, taking fully into account and **balancing between circular economy, social, economic and environmental aspects** in line with the European Green Deal priorities including energy and climate targets and biodiversity.

HORIZON-CL5-2024-D3-01-08:

Demonstration of sustainable wave energy farms

Innovation Action | TRL 8 | 38M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-08

- Különleges kihívás, amit a felhívás megcéloz: **fenntartható pilot hullámerőmű létrehozása és beüzemelése hosszútávra, amely áthidalja a jelenlegi szakadékot a technológia fejlesztés és piaci fejlesztések között, csökkentve a költségeket és a kockázatokat, ez által beruházókat motiválva jövőbeli gazdasági beruházásokhoz.**

The project is expected to deploy a wave energy farm with a minimum capacity of 2 MW and operate the farm at least 2 years in the lifetime of the project. After the project it is expected that the farm will continue to be operated for at least 8 years. The project should develop and execute an effective operation and maintenance programme.

Proposals are expected to address also all the following for both the supporting infrastructure for the farm and for the individual devices themselves: Industrial design and manufacturing processes including set up of an industrial supply chain, circularity of (critical) raw materials, sustainability, scalability, installation methods, transport, operation & maintenance, supply chains and the related digital infrastructures. Projects are requested to demonstrate the technologies at sea while respecting existing environmental regulatory framework. Necessary mitigation measures should be integrated to protect habitats and species. Present an environmental monitoring plan to be implemented during the demonstration action. Environmental monitoring data should be open source and be shared with EMODNET and the IEA OES environmental task.

HORIZON-CL5-2024-D3-01-08:

Demonstration of sustainable wave energy farms

Innovation Action | TRL 8 | 38M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

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The exploitation plans should include preliminary **plans for scalability, commercialisation, and deployment** (feasibility study, business plan, financial model) indicating the possible funding sources to be potentially used (in particular the Innovation Fund).

Data from the pilot structures should be collected **to understand the performance and behaviour of the structure** and the **surrounding environmental condition** to optimise the concept and understand the **environmental impact of wave energy harvesting.**

Expected Outcome:

Project results are expected to contribute to all of the following expected outcomes:

- De-risking wave energy technology development and increased bankability/insurability of wave energy.
- Increased availability and improved market confidence in the technology.
- Increased knowledge on positive and negative impacts of ocean energy on its environment and in the case of negative impacts to protected habitats and species proposals for necessary mitigation measures.
- Publicly available data collected from the demonstration/pilot structure including support structure.

HORIZON-CL5-2024-D3-01-10:

Next generation of renewable energy technologies

Innovation Action | TRL 3-4| 27M EUR/project | 9 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-10

- Különleges kihívás, amit a felhívás megcéloz: **magas kockázatú és magas megtérülésű technológiai fejlesztések a sorsfordító (game changing) megújuló energia technológiák számára.**

Scope: The proposal is expected to address high-risk/high return technology developments for game changing renewable energy technologies. It could **cover catalyst development**, **dedicated renewable energy storage systems**, **integration of renewable energy technologies** into a single energy generation system, **heating & cooling systems**, **fuels production systems**, **solar driven chemical processes, hybrid electricity generation** solutions between different renewable energy sources**, direct utilization of renewable energy sources.**

The following areas **are excluded** from the scope of the topic as they fall within the scope of partnerships or other calls**: hydrogen production through electrolysers, fuel cells.**

 Material research is covered under cluster 4 topics. Batteries as being covered in Destination 2.

It should establish the technological feasibility of its concept, consider transfer developments in sectors other than energy whenever relevant, as they may provide ideas, experiences, technology contributions, knowledge, new approaches, innovative adapted materials for energy and skills.

Whenever the direct use of biogenic waste is considered, it will be taken into account from the design stage.

In developing its concept, the proposal is expected to address the following **related aspects: lower environmental impact, minimising the impacts on biodiversity and protected species and habitats, better resource efficiency (materials, geographical footprints, water, etc…), issues related to social acceptability or resistance to new energy technologies, related socioeconomic and livelihood issues.**

Comparison with current commercial renewable energy technologies and/or solutions is expected. Impacts will be assessed through a quantified based Life Cycle Analysis. Considerations should be given to the regulatory frameworks for their adequate integration.

HORIZON-CL5-2024-D3-01-10:

Next generation of renewable energy technologies

Innovation Action | TRL 3-4| 27M EUR/project | 9 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

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- **Expected Outcome**:

Project results are expected to contribute to all of the following expected outcomes:

- Available breakthrough and game changing renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050.
- Knowledge and scientific proofs of the technological feasibility of the concept including the environmental, social and economic benefits to contribute to R&I strategy and policy forecast.
- Establishing a solid long term dependable European innovation base.

HORIZON-CL5-2024-D3-01-11:

AI Testing and Experimentation Facility (TEF) for the energy sector – bringing technology to the market

Innovation Action | TRL 6-8 | 16M EUR/project | 3 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-11

- Különleges kihívás, amit a felhívás megcéloz: **AI TEF technológiai infrastruktúra, amely az energia szektort valós körülmények között képes tesztelni.**

The TEF is a technology infrastructure that has specific expertise and experience with testing in real conditions in the energy sector. They should **build on existing infrastructures, facilities**.

The TEF has **the scope to then bridge the gap between lab and market due to lack of in-depth testing of AI technology in the real environment** to fully validate them before the deployment. **Energy AI TEF will aim at testing AI–based technologies and solutions that have already been tested in the labs and have to be tested in operational environments**.

Energy AI TEF will aim at optimising the deployment of AI-based solutions for a greener, smarter, more resilient, and more flexible energy system. For instance, it can investigate, how electricity grids respond to stimuli or shocks (e.g. RES integration, cyber-attacks, micro-grids development), making use of digital twins of the electricity grid at local level. Energy AI TEF can also target distribution grid optimisation, integrating both (decentralised) supply and demand-side, taking into account energy data coming from buildings, local storage, DER, electrical vehicles TEFs can also support regulatory sandboxes by setting up a dialogue with competent national authorities for supervised testing and experimentation under real or close to real conditions.

The TEF can also support the development of new standards and ontologies for AI-Software for energy sector and common interoperability framework. Energy AI TEF should give regions a further boost in attracting funding to upgrade its facilities and also attracting innovative players to collaborate with its own champions. In addition, TEF will contribute to more trustworthy AI made in Europe.

HORIZON-CL5-2024-D3-01-11:

AI Testing and Experimentation Facility (TEF) for the energy sector – bringing technology to the market

Innovation Action | TRL 6-8 | 16M EUR/project | 3 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-11

- **Expected Outcome:**

Project results are expected to contribute to all of the following expected outcomes:

 Large-scale reference testing and experimentation facilities (TEFs) will offer a combination of physical and virtual facilities, in which technology providers can get support to test their latest AI-based software and hardware technologies in operational environments.

 This will include support for full integration, testing and experimentation of latest AI

based technologies to solve issues/improve solutions in the energy sector, at national as well as at local level, including validation and demonstration.

 The TEF is open to all the sites in Europe and equipped with the right equipment (Infrastructure, computing capacity & latest AI innovations).

 The TEF is a "long term investment". There should be a business model to guarantee self-sustainability.

HORIZON-CL5-2024-D3-01-12:

Energy Management Systems for flexibility services

Innovation Action | TRL 7-8 | 10M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-12

- Különleges kihívás, amit a felhívás megcéloz:

Scope: Projects are expected to: **Develop solutions** to aggregate flexibility from different (types of) energy consumers that use different energy management systems to develop interoperable solutions to optimise the energy management systems and valorise its flexibility in wholesale markets and for balancing and/or congestion management services). **Define and demonstrate the type of flexibility services that clusters of smart buildings and smart industrial sites** can provide. **Cooperate with** (one or more) TSOs and/or DSOs, preferably making use of day-to-day operational flexibility markets (i.e. not R&I projects or regulatory sandboxes). **Include at least 3 different energy management systems** in case of industry, **or 5 in case of buildings**, developed by different technology providers and that use different protocols/standards/proprietary solutions for the energy management system. **Involve at least 3 different energy system management service companies in case of industry**, or 5 in case of buildings. **Include at least 2 aggregators** to ensure that developed solutions are based on standards and to avoid proprietary solutions. **Include at least 1 home appliances producer in case of buildings**.

To ensure interoperability and integration into the grid, specific demonstrators will make use of operational end-to-end architectures, digital platforms and other data exchange infrastructure for the energy system being developed under ongoing Horizon 2020, Horizon Europe as well as under other EU programs such as the Digital Europe Program. Preferably semantically interoperable interactions, as enabled by the ETSI SAREF ontologies, are used. Design and demonstrate appropriate concepts for acquiring and activating flexibility (implicit and explicit) that allow to maximally benefit from the potential of these new services. **The project should demonstrate or recommend how the coordination and cooperation between TSO and DSO** has to be organized to adopt the different concepts for services, products and markets.

The selected projects are expected to contribute to the BRIDGE initiative 190 , actively participate to its activities and allocate up to 2% of their budgets to that end. Additional contributions to the 'Alliance for Internet of Things Innovation' (AIOTI) and other relevant 190 https://www.h2020-bridge.eu might be considered, when relevant

HORIZON-CL5-2024-D3-01-12:

Energy Management Systems for flexibility services

Innovation Action | TRL 7-8 | 10M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-12

Expected Outcome:

Project results are expected to contribute to all of the following expected outcomes:

- Contribute to the use of **smart buildings and smart industrial** sites for the integration of renewables in the energy system in an efficient way.
- **Demonstrate aggregation of multiple** (building or industrial) **energy management systems** to provide flexibility services (wholesale market price signals, demand response, flexible production, smart charging, balancing & frequency services, congestion management) to the electricity network.
- **Demonstrate interoperability** and **data exchange technologies** to aggregate data from different sources and in different formats through cooperation between aggregators and energy management system developers.
- **Piloting and demonstration** of flexibility pool operations **at the local and regional levels.**

The selected projects should propose recommendations how current products, markets and market processes for flexibility should be adapted to accommodate these new services and/or fully benefit from the potential these improved energy management services will bring.

HORIZON-CL5-2024-D3-01-13:

DC and AC/DC hybrid transmission and distribution systems

Research Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-13

Scope: Projects are expected to implement the activities in (1) and the practical demonstration in (2) as described below:

1. R&I, methodologies and tools involving the activities in the three subtopics (A, B and C) listed below. These can be developed/complemented with others pertinent to each subtopic. A) DC – AC / DC hybrid system Design & Planning a. Demonstration of software tools for transnational AC/DC hybrid power system planning and management to enable HVAC/HVDC/MVDC/LVDC hybrid systems, such as: integration of multi-terminal HVDC systems, both offshore and onshore and HVDC links embedded within the HVAC network as well as HVDC ties (inter-) connecting different control zones and synchronous areas (in full or in back-to-back schemes); representation and modelling of transmission and distribution grids as well as multienergy vector integration (sector coupling) for long-term and for transient and dynamic analysis. b. Demonstration of reliability and resilience methodologies to address security and adequacy issues and criteria via not only deterministic but also probabilistic (e.g., Monte-Carlo) methods. c. Demonstration of developed methodologies and requirements for interoperability among Multi Terminal, Multi-Vendor MVDC and LVDC systems. B) AC and DC Grid Forming Capability Functional requirements and demonstration of grid forming capability for hybrid HV AC/DC networks (e.g., offshore wind, HVDC transmission or multi-terminal HVDC grid, potentially associated with energy storage systems). Functional requirements and demonstration of grid forming capability for hybrid MV and LV AC/DC networks (grid connected and islanded operation with distributed energy sources). Functional requirements and validation procedure for testing grid-forming capabilities offered by HVDC, MVDC and LVDC systems. C) DC Distribution & microgrids Modelling (steady state and transient models) for systems including different typology of RES, EVs, storage and loads (system architecture, voltage level, control, stability, protection, and storage integration). Planning and design of MVDC distribution grids as the intermediate layer between the HVDC and the AC or DC Low Voltage local distribution grid and loads. Functional requirements for the AC-DC converters, DC-DC converters, switchgear (including protection equipment) and cables based on the different typologies and power rating applications
2. Demonstration, test and validation of the activities developed in (1) in at least three pilots – one for each sub-topic (A, B and C) – in different EU Member States/Associated Countries. International cooperation with countries of the Mediterranean Region is encouraged.

HORIZON-CL5-2024-D3-01-13:

DC and AC/DC hybrid transmission and distribution systems

Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-13

- **Expected Outcome:**

Project results are expected to contribute to all the following outcomes:

- Demonstrated top-down electricity system orchestration of future pan-European AC / DC hybrid system architecture - including offshore grid and energy islands - at different voltage levels (HVDC, MVDC, LVDC) down to DC microgrids.
- Developed methodologies for operational planning and design of DC and AC / DC hybrid systems, considering all possible sources, loads and storage, from high-voltage transmission level to distribution-connected assets. This includes a cost benefit analysis for stability management options.
- Developed methodologies and requirements for interoperability among Multi Terminal, Multi-Vendor MVDC and LVDC systems.
- Demonstrated technologies to be applied to the energy system to address the gradual loss of inertia caused by the increasing penetration of Power Electronics Interfaced Generators (i.e., RES such as PV, Wind, etc.).
- Demonstrated DC transmission and distribution systems and technologies.
- Components and systems for smart substations.
- Close collaboration among the key grid stakeholders (non-exhaustive list: software developers, system manufacturers, TSOs, third-party system integrators, wind turbine manufacturers, offshore wind farm developers, PV plants, storage systems, etc.).

HORIZON-CL5-2024-D3-01-14:

Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector

Research Innovation Action | TRL 5-6 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-14

- Különleges kihívás, amit a felhívás megcéloz: **erősáramú elektronika (PE) – szélessávú erősáramú elektronika az energia szektor számára**

Scope: Projects are expected to implement both the activities in (1) and the practical demonstration (2) as described below:

1. R&I, methodologies and tools involving the activities listed below. These can be developed/complemented with others pertinent to each sub-topic. A. Condition and Health Monitoring (C&HM): Estimation of junction temperature Tj based on TSEPs (thermo-sensitive electrical parameters). Here especially big challenge present SiC MOSFETS and Schottky diodes because the TSEPs sensitivity is lower, non-linear and depends on the built technology. Further issues are calibration, circuit drift, influence of PWM and other. Development of new and evaluation/further development of already existing unconventional techniques to measure temperature and estimate degradation (such as for example, but not limited to, Kelvin connection or acoustic based methods). Development and evaluation of new or already existing techniques for generating the lifetime models based on big-data analysis and by utilisation of soft computing techniques. Combination of (big) data-driven and physics-of-failure driven approaches in C&HM. B. Stress Steering: Successful business case realisation requires co-operation and communication between different partners: Manufacturers of power electronics components (for example to integrate sometimesnecessary sensors). System designer (to provide access to the data such as measured load cycles and general mission profiles). Companies responsible for operation and maintenance of the systems. Currently those companies are especially for offshore wind parks developing their own C&HM systems, which are operating, based on sometimes-scarce available data Optimisation is possible when already initial products would be designed to obtain data/measurements needed in C&HM. For power electronics modules, the most valuable data seems to be Tj (junction temperature): Careful estimation of the costs of maintenance for specified applications (it seems they are currently underestimated). Investigation of different costs models (e.g., the final costs for C&HM can be absorbed by the producers especially when it is also responsible for maintenance, or it can be transferred to the final user whenever the final user can provide safer and more reliable service). C. Wide Band Gap and Ultra-Wide Bandgap PE: Improvement of WBG and UWBG semiconductors for integration in HVDC and MVDC components. Work should focus on improving wide bandgap semiconductor devices, packaging and their integration in converter submodules: Improved WBG and UWBG power devices with better performance metrics, e.g., lower conduction losses, higher blocking voltage, better surge current capability, higher switching frequencies and better short-circuit capability. Advanced control circuits for WBG and UWBG based bridges. Improved packages featuring high-voltage insulation, high temperature operation, robustness, and low eddy currents. New submodule topologies for HVDC converters and/or new converter topologies for MVDC converters with WBG and UWBG semiconductors and better performance metrics, e.g., reduced losses, higher reliability, lower volume / weight, less costs. Implementing WBG and UWBG semiconductor devices for DC protection devices, e.g., DC breakers. Improved cost efficiency of components based on WBG semiconductors.
2. **Demonstration, test and validation** of the activities developed in (1) (A, B and C) **in at least two pilots** (all activities A, B and C developed for each pilot**) in different EU Member States/Associated Countries.**

HORIZON-CL5-2024-D3-01-14:

Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector

Research Innovation Action | TRL 5-6 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-14

- **Expected Outcome:**

Project results are expected to contribute to all the following outcomes:

a. **Condition and Health Monitoring:** **Capability to anticipate failures** of Power Electronics (PE) in wind farms and converters of the DC grid to prevent downtime. **Techniques to set the equipment in limp mode** to enable to withstand the stress until next maintenance. **Demonstration of Condition and Health Monitoring** (C&HM) **for converters** of wind turbines generators and HVDC converter stations or MVDC converters (solar energy).

b. **Wide Band Gap and Ultra-Wide Bandgap PE:** Development of **new semiconductor power device technologies**, in particular Wide Bandgap (WBG) and ultra-wide Bandgap (UWBG) semiconductors **Availability of more efficient** Power Electronics **components** for the development of new generation of inverters, converters and other power equipment in the energy sector. **Reduced space occupancy** aiming mainly at offshore applications. **Improved cost efficiency** of power devices and semiconductor fabrication processes.

HORIZON-CL5-2024-D3-01-15:

HVAC, HVDC and High-Power cable systems

Research Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-15

Scope: Projects are expected to implement at least three of the activities in (1) for one or more subtopics (A, B, C) or (2) for one or more subtopics (D, E, F) and the practical validation in (3) as described below:

1. R&I, methodologies and tools involving the activities listed below. These can be developed/complemented with others pertinent to the topic. A. Innovation in cable systems Development of new insulating materials for dry type accessories for high temperature and above 525 kV Optimisation of newly developed high electrical resistivity insulating materials for use above 525 kV in cable and/or accessories. Development of new network components with reduced environmental impact such as EHV/HV cables without lead, application of superconductors, AC, DC cables/gas insulated lines for voltages above 525 kV. Development of larger conductor cross sections. Development of smaller conductor cross sections and leveraging higher current superconductors - greater power density benefits. Increase of maximum insulation operating temperature, such as for high load urban areas where available space for power transfer is limited. Further improvement of different types of extruded insulation materials (e.g., AC, DCXLPE, Polypropylene) cables, and render recyclability of the materials feasible by refining the procedure of separation of the many components of the cable – insulation, wires, tapes, sheaths, etc. – from each other.

Establishment of procedures for recycling and related possible products. Feasibility study for use of superconducting cables for submarine connections to determine their environmental benefits e.g., extremely low heat emittance, since they do not emit any heat, zero magnetic field benefits to marine fauna, smaller cable corridors for higher power densities, smaller landfall space requirements, etc. Simulation and design of innovative dynamic cable systems to meet the needs of the growing floating offshore applications. B. Predictive models for cable system ageing (fraction-of-life lost, remaining life), life and reliability Modelling of space charge phenomena (as well as other relevant phenomena) in newly developed insulating materials, in full size cables and accessories. Modelling of its effects on cable system aging taking advantage of advanced experimental space charge measurement techniques. AI methods for managing a cable fleet angle. Impact of water absorption on ageing of lead-free wet-design HVDC or High-Power cables. Ageing of cable systems, including effect of contaminants, humidity and temperature, and its implications for space charge accumulation and lifetime estimations. Test methods to quantify ageing in a DC environment, such as voltage form for DC-specific breakdown testing

HORIZON-CL5-2024-D3-01-15:

HVAC, HVDC and High-Power cable systems

Research Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-15

B. Predictive models for cable system ageing (fraction-of-life lost, remaining life), life and reliability Modelling of space charge phenomena (as well as other relevant phenomena) in newly developed insulating materials, in full size cables and accessories. Modelling of its effects on cable system aging taking advantage of advanced experimental space charge measurement techniques. AI methods for managing a cable fleet angle. Impact of water absorption on ageing of lead-free wet-design HVDC or High-Power cables. Ageing of cable systems, including effect of contaminants, humidity and temperature, and its implications for space charge accumulation and lifetime estimations. Test methods to quantify ageing in a DC environment, such as voltage form for DC-specific breakdown testing. C. Monitoring and fault location systems Continuous temperature and acoustic monitoring of long cable system lengths. Accurate and instantaneous fault location systems for long cable system lengths. Further development and improvement of on- and off-line diagnostics and condition monitoring techniques for HVDC or High-Power cable systems such as PD and leakage current measurements for online and space charge and dielectric permittivity and loss factor measurements for offline. Innovative technological solutions such as fibre-based and/or robotic technologies for data collection and maintenance in in all type of location (easy-to-access and inhospitable). Development of procedures for optimised maintenance and repair concepts of offshore stations using BIM and 3D-Models.

HORIZON-CL5-2024-D3-01-15:

HVAC, HVDC and High-Power cable systems

Research Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-15

2. Investigation and development of potential replacement of HVAC overhead lines with HVDC or High-Power cable solutions to increase capacity transfer without the need of building new infrastructures but reusing existing right of ways. D. Cost-Benefit Analysis for different options of HVAC OHL conversion Mapping of the potential use cases for replacement of HVAC with HVDC or HighPower solutions (buried or overhead) supported by a Cost-Benefit Analysis. Cost-Benefit Analysis for conversion of HVAC OHL to HVDC, High Power OHL or buried High-Power cable solutions. Resilience and reliability analysis of different HVAC OHL conversion options – underground cable, HVDC OHL and buried High-Power cable solutions. E. Technical innovations and design methodologies of hybrid HV AC/DC overhead lines Insulation coordination and clearances calculation methodologies, for HVDC and hybrid HV AC/DC overhead lines. Electrical field and ion current density calculation methodology under hybrid HV AC/DC OHLs ion flow field. Operation, control and protection of hybrid AC/DC overhead lines. Management of long-distance mixed cable and OHL HV corridors. F. Pan-European grid studies and unification of voltage level of the converted OHLs from HVAC to HVDC Proposal of a unified DC voltage level of the converted lines considering the standard towers and line designs of HVAC OHLs (220 kV, 400kV) in the European network to provide a general conversion approach, compatible with minimum operation downtime. Perform pan-European grid studies to propose a unified strategy toward an overlaying HVDC grid based on the converted HVAC OHLs and existing corridors with minimized environmental impact, link downtime and implementation time. Dynamic grid studies to demonstrate the impact of the HVAC OHL conversion to HVDC. Develop identification criteria for the candidate HVAC OHL corridors (to be converted in HVDC).

3. Test and validation of the activities developed in (1) consisting of at least one of the activities described in each subtopic A, B, C or (2) consisting of at least one of the activities described in each subtopic D, E, F in at least two validation tests in different EU Member States/Associated Countries.

HORIZON-CL5-2024-D3-01-15:

HVAC, HVDC and High-Power cable systems

Research Innovation Action | TRL 4-5 | 13M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-15

Expected Outcome:

Project results are expected to contribute to at least three of the following outcomes:

 High Voltage (HV), Extra High Voltage (EHV) or High Power/superconducting cable systems, including dynamic AC – DC cables. Development of not only better performing, but also more environmentally friendly materials for cable and accessory insulation. Improved tools for remote monitoring, repair and maintenance of equipment. Assessment of the feasibility of new cable system technologies. Increased reliability of HVDC or High-Power cable systems, through improved cable accessory design and/or ageing studies and/or use of cable condition monitoring techniques.

 Reduced cost of HVDC or High-Power cables, which increases feasibility of implementation in smaller projects, reducing the visual impact and improves social acceptability compared to AC overhead lines. Reducing the environmental impact of HVDC or High-Power cable systems through use of component designs with smaller climate footprints such as gas-free accessories or through conversion and reuse of existing infrastructure to increase power transfer capacity. When power demand increases and the ampacity of the power line is reached, the replacement of HVAC overhead lines with HVDC or with High-Power cable systems can avoid building new lines or reinforcing the grid. Increased power transfer over the same corridor and same or smaller right of ways. Methodology development of the OHL conversion from AC to DC with minimal line outage Contribution to the emergence of standards for DC OHLs in Europe Benefits of power dense technology options and avoidance of grid reinforcement

HORIZON-CL5-2024-D3-01-16:

Demonstration of innovative pumped storage equipment and tools in combination with innovative storage management systems

Innovation Action | TRL 7-8 | 8M EUR/project | 1 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-16

- Különleges kihívás, amit a felhívás megcéloz: **innovatív tárolási módszerek demonstrálása- innovatív vízerőmű technológiák**

Scope:

Demonstration of innovative pumped storage equipment and digital tools linking the mechanical storage with innovative storage management systems. The latter may involve hybridisation with storage technologies to reap the full potential of pumped hydro storage under new market conditions Solutions should deliver innovative hydropower technologies adapted to unconventional storage schemes, including e.g. low-head locations or former coal mines and/or harsher operation conditions, e.g. using salt water, while minimising CAPEX, OPEX and improving life time and circularity of components. **For the storage management system, digital tools** for strategic and operational management **should address current developments for energy storage, considering markets, variable renewable production and effects of climate change, and including novel approaches to energy.** Demonstrated storage solutions should respond to the **highest standards of environmental sustainability** which is underpinned by a LCA and involve Citizens and Communities during all phases of the project activities, respectively. An analysis of innovative storage potential and impact should be performed. Proposals should provide information and assessment about the **economic feasibility and the potential of scaling-up the technology at commercial scale as appropriate.**

The exploitation plans should include **preliminary feasibility study and business plan** also indicating the possible funding sources to be potentially used (such as private equity, InvestEU, EU Catalyst Partnership and the Innovation Fund)

HORIZON-CL5-2024-D3-01-16:

Demonstration of innovative pumped storage equipment and tools in combination with innovative storage management systems

Innovation Action | TRL 7-8 | 8M EUR/project | 1 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-16

- **Expected Outcome:**

Project results are expected to contribute to all of the following expected outcomes:

 Increased availability of innovative hydropower storage, in combination with innovative storage management systems. Maintain and increase technology leadership, competitiveness and technology export potential of European hydropower storage technology industry.

 Enhanced sustainability of innovative hydropower storage technologies, taking fully into account circular economy, social, economic and environmental aspects in line with the European Green Deal priorities.

 Reduced cost and improved efficiency of hydropower storage installations and the underlying technologies.

HORIZON-CL5-2024-D3-01-17:

Development and integration of advanced software tools in SCADA systems for High, Medium and Low voltage AC/DC hybrid systems

Innovation Action | TRL 6-8 | 12M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-17

- Különleges kihívás, amit a felhívás megcéloz: **software fejlesztés és beépítés SCADA rendszerekbe magas, közepes és alacsony feszültségű AC/DC hibrid rendszereknél**

Scope: Projects are expected to implement the activities in (1), the practical demonstration (2) and the recommendations for grid codes (3) for a realistic use case, at one or two voltage levels or at system level including all three voltage levels as described below: 1. Development of methodologies, technologies, algorithms and software tools, involving at least three of the activities listed below. Development of innovative technologies, algorithms and analysis modules for multi terminal HVDC system – Software tools for analysing stability compatibility between DC and AC power system (e.g., Grid forming Vs. DC voltage stability) **Development of innovative algorithms** and software tools for analysing and controlling the system of mixed, hybrid AC/DC grids. Integration of these tools into the control room software. **Scalable and flexible software framework** for operation of hybrid AC/DC power systems supporting various vendor-dependent systems and component models, e.g., more accurate and wider representation of connected systems, power flow calculations. **Vendor independent hybrid DC/AC network SCADA/Energy** Management System and upper-level control of voltage source converters (multi-vendor, multi-terminal), including changing active power set points, voltage/reactive power control set points and changing controller parameters. **Development and management of small signal** and dynamic stability in a hybrid AC/DC power system with high penetration of inverter-based resources. Development of a robust online real-time estimation and calculation of the system state of the AC, DC and hybrid system. **Development of safety and reliability analysis of the system state**, analysis of possible failure situations as well as curative measures for the failure event, e.g., transient and dynamic stability, coordinated risk management. Development and integration of cyber secure resilient ICT platforms and communication for data exchange. **Development of a DC link** for firewalling the grid from cascading effects due to faults or cyberattacks. 2. **Demonstration, test and validation** of the activities developed in (1) for a fully automated decision support system for control centres in at least two pilots in different EU Member States/Associated Countries. 3. **Recommendations for changes in grid codes**, which can facilitate the deployment of the technology and ensure the full exploitation of the assets.

HORIZON-CL5-2024-D3-01-17:

Development and integration of advanced software tools in SCADA systems for High, Medium and Low voltage AC/DC hybrid systems

Innovation Action | TRL 6-8 | 12M EUR/project | 2 to be funded | Opening: 12 Sep 2023 | Deadline 16 Jan 2024

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2024-d3-01-17

- **Expected Outcome:**

Project results are expected to contribute to at least three of the following outcomes:

- Optimised connection between power system design, preoperational planning and real time monitoring and control.
- Measures and strategies for stability management of the future HVDC/MTDC power system connecting renewable energies (more specifically onshore wind farm).
- Measures and strategies for stability management of the future AC/DC hybrid power system with a high share of Power Electronic Interfaced Devices (PEID).
- Real-time capable algorithms and tools that enables optimal operation of the hybrid AC/DC system (e.g., avoidance of circular flows) and to support security analyses.
- Innovative ancillary services (e.g., frequency control, mitigation of periodic frequency fluctuations, voltage regulation and reactive power control).
- The possibilities offered by fast DC control in terms of islanding, black-start capability, firewalling for fault impact minimisation/avoidance, support for fault identification and return to safe, normal operation.
- Increased security of supply through firewalling cascading effects due to faults or cyberattacks by segmentation of the grid with a DC link.

A felhívások elérése – pályázati felület

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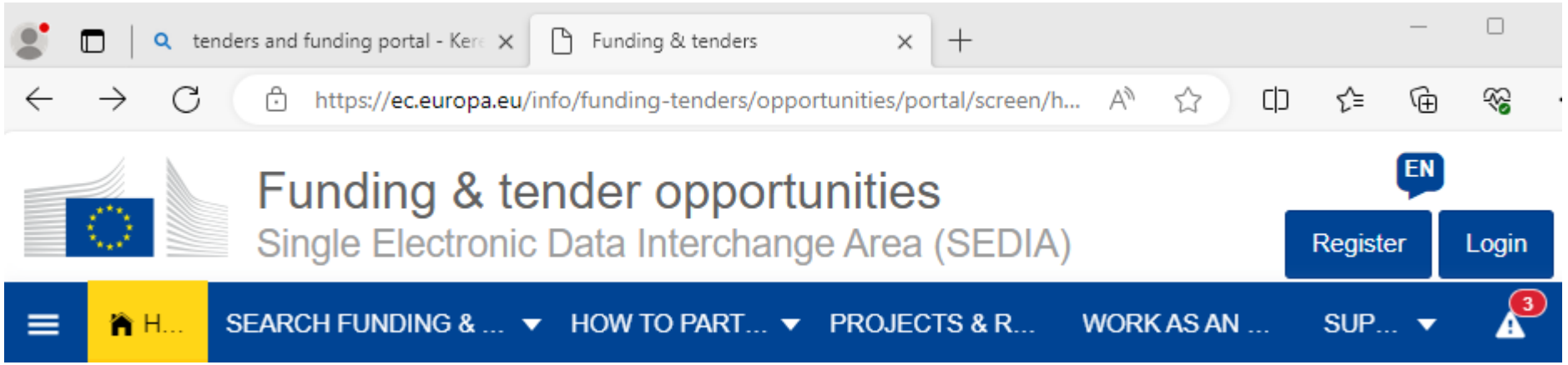
Funding and tender opportunities

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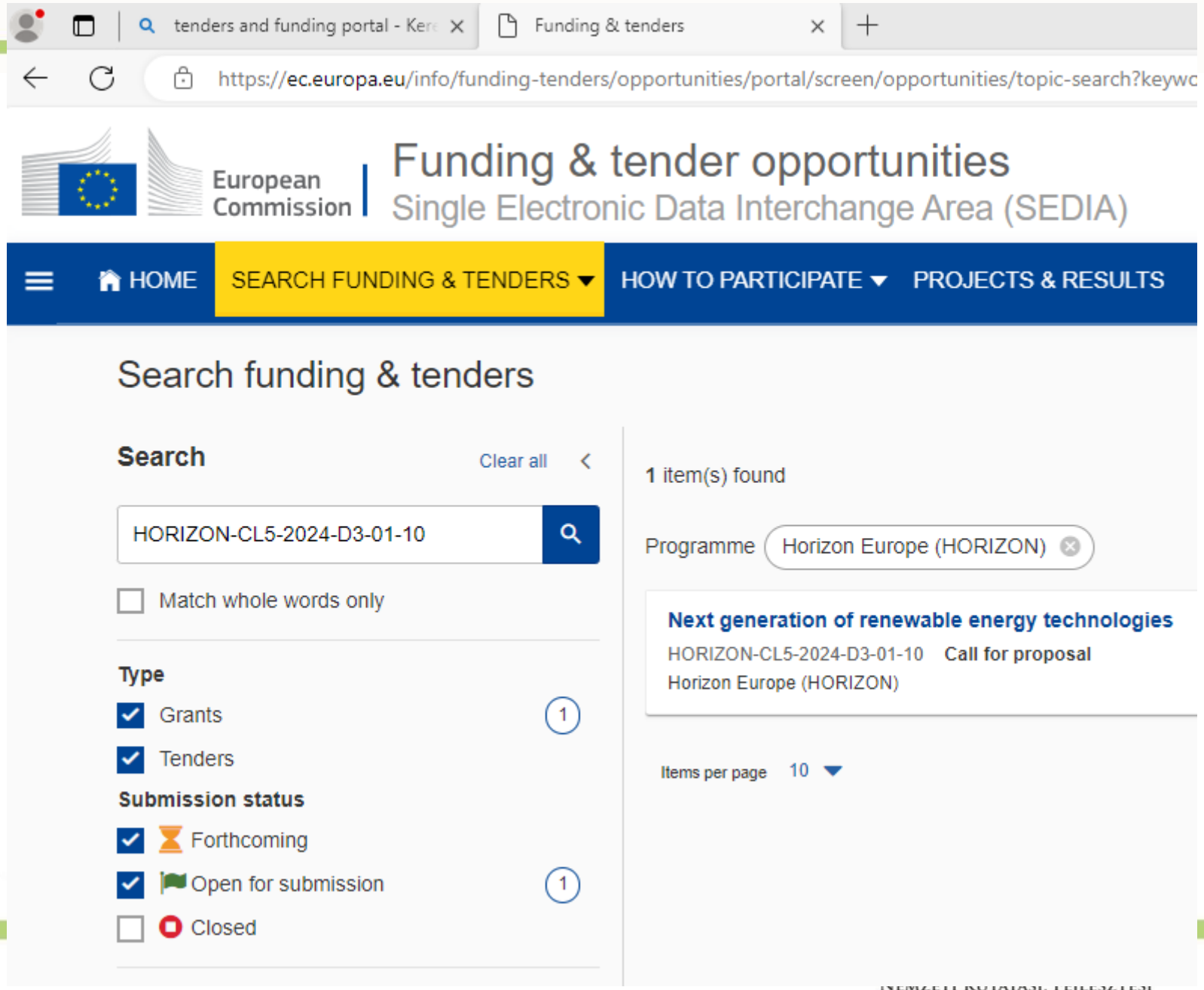
EU External Action (RELEX)
EU4Health Programme (EU4H)
Euratom Research and Training Programme (EURATOM)
Europe Direct (ED)
European Defence Fund (EDF)
European Maritime, Fisheries and Aquaculture Fund (EMFAF)
European Parliament (EP)
European Social Fund + (ESF)
European Solidarity Corps (ESC)
Fiscalis Programme (FISC)
Horizon Europe (HORIZON)
Information Measures for the EU Cohesion policy (IMREG)
Innovation Fund (INNOVFUND)
Internal Security Fund (ISF)
Interregional Innovation Investments Instrument (I3)
Just Transition Mechanism (JTM)
Justice Programme (JUST)
Neighbourhood, Development and International Cooperation Instrument – Global Europe (NDICI)
Pilot Projects and Preparation Actions (PPPA)
Programme for the Environment and Climate Action (LIFE)
Programme for the Protection of the Euro against Counterfeiting (PERICLES IV)
Promotion of Agricultural Products (AGRIP)
Research Fund for Coal & Steel (RFCS)
Single Market Programme (SMP)
Social Prerogative and Specific Competencies Lines (SOCPL)
Technical Support Instrument (TSI)
Union Anti-fraud Programme (EUAF)
Union Civil Protection Mechanism (UCPM)
Union Renewable Energy Financing Mechanism (RENEWFM)
Show all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PROJECTS & RESULTS
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1 item(s) found
Programme
Horizon Europe (HORIZON)
Next generation of renewable energy technologies
HORIZON-CL5-2024-D3-01-10 Call for proposal
Horizon Europe (HORIZON)
Items per page
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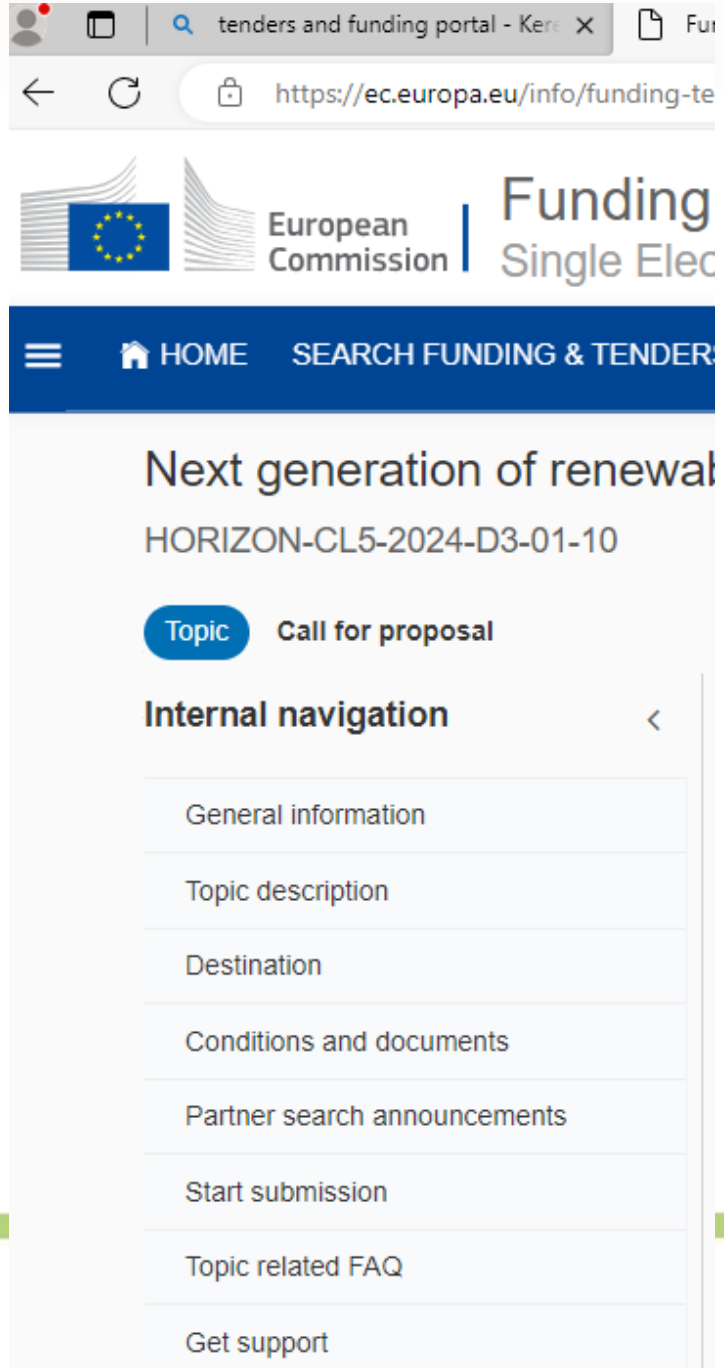
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Topic
Call for proposal
Internal navigation
General information
Topic description
Destination
Conditions and documents
Partner search announcements
Start submission
Topic related FAQ
Get support

Kérdések –válaszok

HORIZON-CL5-2024-D3-01-10: kérdések és válaszok

Is the use of waste heat treated as a reduction in fossil fuel consumption?

- As the expected outcomes state, the topic aims to create "Available breakthrough and game changing renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050". Simply introducing a change in an industrial process, while interesting, does not have at first glance the high-risk component asked for in the topic. The scope requires, by default, the use of renewable energy in the process to produce the electrons to drive the process. Electrochemistry using directly renewable energy to produce the electrons to drive the process is allowed. Using electricity to drive the production process of hydrogen via electrolysers is excluded.

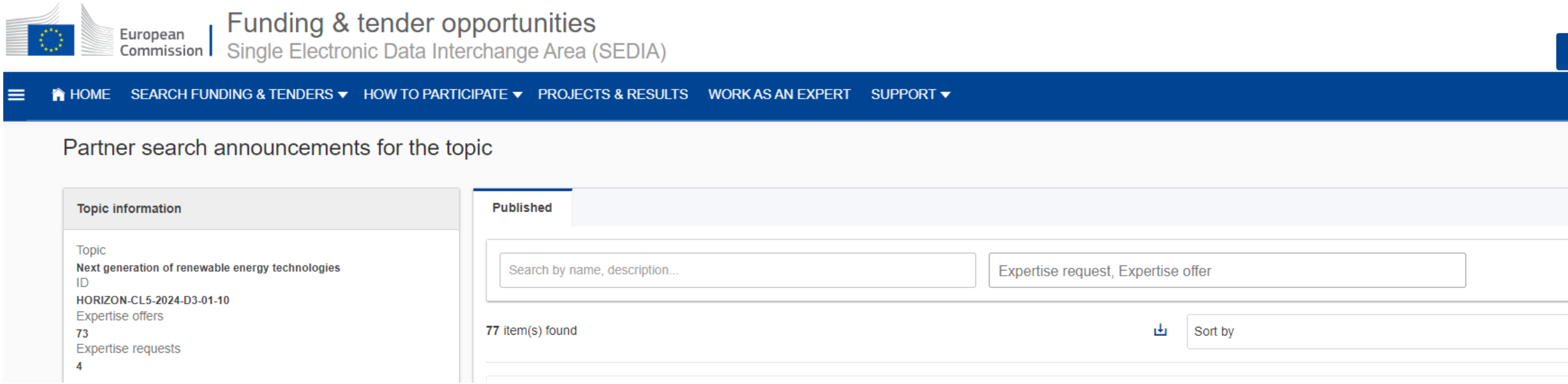
Clarification on the sentence: "The selected projects are expected to contribute to the BRIDGE initiative, actively participate to its activities and allocate up to 2% of their budgets to that end. Additional contributions to the 'Alliance for …"

- The aim of the Bridge initiative is to increase the impact of projects in 2 ways: to exchange experiences and best practices among projects so that they can build on each other's work and cooperate across projects; to provide input to EU-level policy discussions based on coordinated and aggregated feedback from projects so that policy actions benefit from project experience and evidence.
- Projects are expected to support the provision of advice and evidence for EU policy making by taking an active role in at least one of the Bridge working groups, by contributing to its annual work programme and related reports. They would also be expected to participate in the Bridge annual general assembly and, more generally, by sharing experiences and best practices with the other Bridge member projects. Applicants could already specify in their application the activities and the fields of interests for the cooperation with the Bridge initiative. Applicants are not expected to contact the Bridge secretariat during the proposal preparation but only when the project has been awarded.

What does "*direct utilization of renewable energy sources*" mean?

- The renewable energy source is converted into use (heat, cooling, fuels, work) without intermediaries being carried to the use. In that respect, electricity could be produced in the case of a direct use integrated into a product or a process.

Partnerkeresők felhívásonként



Partnerkeresők felhívásonként és kérdések

Felhívás	Terület	Kérdések	Partner keresők	Magyar partner keresők
HORIZON-CL5-2024-D3-01-01	Alternative equipments and processes for advanced manufacturing of PV technologies	0	28+2	0
HORIZON-CL5-2024-D3-01-02	Low-power PV	0	32+4	0
HORIZON-CL5-2024-D3-01-03	Demonstration of improved intermediate renewable energy carrier technologies for transport fuels	0	51+2	0
HORIZON-CL5-2024-D3-01-04	Improvement of light harvesting and carbon fixation with synthetic biology and/or bio-inspired//biomimetic pathways for renewable direct solar fuels production	0	42+3	0
HORIZON-CL5-2024-D3-01-05	Development of carbon fixation technologies for biogenic flue gases	1	29+3	0
HORIZON-CL5-2024-D3-01-06	Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations	0	43+3	0
HORIZON-CL5-2024-D3-01-07	Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations	2	34+1	0
HORIZON-CL5-2024-D3-01-08	Demonstration of sustainable wave energy farms	1	39+2	0
HORIZON-CL5-2024-D3-01-09	Africa-EU CO-FUND action	0	68+1	0
HORIZON-CL5-2024-D3-01-010	Next generation of renewable energy technologies	2	72+4	0
HORIZON-CL5-2024-D3-01-11	AI Testing and Experimentation Facility (TEF) for the energy sector – bringing technology to the market	1	45+2	0
HORIZON-CL5-2024-D3-01-12	Energy management systems for flexible services	1	58+4	1
HORIZON-CL5-2024-D3-01-13	DC and AC/DC hybrid transmission and distribution systems		30+1	0
HORIZON-CL5-2024-D3-01-14	Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector	1	32+1	0
HORIZON-CL5-2024-D3-01-15	HVAC, HVDC and High-Power cable systems	1	33+2	0
HORIZON-CL5-2024-D3-01-16	Demonstration of innovative pumped storage equipment and tools in combination with innovative storage management systems	0	25+1	0
HORIZON-CL5-2024-D3-01-17	Development and integration of advanced software tools in SCADA systems for High, Medium and Low voltage AC/DC hybrid systems	0	24+1	0

Általános pályázási feltételek

1. **Admissibility conditions:** described in Annex A and Annex E of the Horizon Europe Work Programme General Annexes

   Proposal page limits and layout: described in Part B of the Application Form available in the Submission System

2. **Eligible countries:** described in Annex B of the Work Programme General Annexes

   A number of non-EU/non-Associated Countries that are not automatically eligible for funding have made specific provisions for making funding available for their participants in Horizon Europe projects. See the information in the Horizon Europe Programme Guide.

3. **Other eligibility conditions:** described in Annex B of the Work Programme General Annexes

   If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).

4. **Financial and operational capacity and exclusion:** described in Annex C of the Work Programme General Annexes

5. **Evaluation and award:**

   Award criteria, scoring and thresholds are described in Annex D of the Work Programme General Annexes

   Submission and evaluation processes are described in Annex F of the Work Programme General Annexes and the Online Manual

   Indicative timeline for evaluation and grant agreement: described in Annex F of the Work Programme General Annexes

6. **Legal and financial set-up of the grants:** described in Annex G of the Work Programme General Annexes

Call documents:

- Standard application form — *call-specific application form is available in the Submission System*
- Standard application form (HE RIA, IA)
- Standard evaluation form — *will be used with the necessary adaptations*
- Standard evaluation form (HE RIA, IA)
- MGA
- HE General MGA v1.0

Útmutatók és egyéb anyagok

HE Main Work Programme 2023–2024 – 1. General Introduction
HE Main Work Programme 2023–2024 – 8. Climate, Energy and Mobility
HE Main Work Programme 2023–2024 – 13. General

Annexes
HE Programme Guide
HE Framework Programme and Rules for Participation
Regulation 2021/695
HE Specific Programme Decision 2021/764
EU Financial Regulation
Rules for Legal Entity Validation, LEAR Appointment and Financial Capacity Assessment
EU Grants AGA — Annotated Model Grant Agreement
Funding & Tenders Portal Online Manual
Funding & Tenders Portal Terms and Conditions
Funding & Tenders Portal Privacy Statement

HORIZON EUROPE -CLUSTER 5 events and webinars

Webinars (europa.eu):

- Finding opportunities and submitting a proposal in Horizon Europe
- Lump Sum Funding in Horizon Europe: How does it work? How to write a proposal?
- Horizon Implementation Day: Grant Management in Horizon Europe
- Funding & Tenders Portal Partner Search and person profile
- A successful proposal for Horizon Europe: Scientific-technical excellence is key, but don't forget the other aspects
- The Gender Equality Plan eligibility criterion in Horizon Europe: Who is concerned? How to comply with it?
- További témák

Eligibility: kik pályázhatnak?

- Kik pályázhatnak? Bárki jogi személy, akár III. országokból részt vehet a pályázatban

„Any legal entity, regardless of its place of establishment, including legal entities from non associated third countries or international organisations (including international European research organisations) is eligible to participate (whether it is eligible for funding or not), provided that the conditions laid down in the Horizon Europe Regulation have been met, along with any other conditions laid down in the specific call topic."

- Kedvezményezett: az, aki támogatására jogosult (támogatásra jogosultak az alábbi országok pályázói):

EU tagállamok: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

Horizont Európa programhoz társult országok: Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Kosovo14, Moldova, Montenegro, North Macedonia, Norway, Serbia, Tunisia, Turkey, Ukraine.

Alacsonyjövedelmű és középjövedelmű országok: Afghanistan, Algeria, Angola, Argentina, Azerbaijan, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Central African Republic, Chad, Colombia, Comoros, Congo (Democratic Republic), Congo (Republic), Costa Rica, Côte d'Ivoire, Cuba, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt (Arab Republic), El Salvador, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Fiji, Gabon, Gambia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Indonesia, Iran (Islamic Republic), Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Korea (Democratic People's Republic), Kyrgyz Republic, Lao (People's Democratic Republic), Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia (Federated States), Mongolia, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, 13 The list is correct at the time of adoption of this Work Programme. Please see the Horizon Europe List of Participating Countries on the Portal for up-to-date information on the current list and on the position for Associated Countries. 14 This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence. 15 The list is correct at the time of adoption of this Work Programme. See the Horizon Europe List of Participating Countries on the Portal for an up-to-date list of these countries. Horizon Europe - Work programme 2023-2024 General Annexes Part 13 - Page 10 of 43 Palestine16, Papua New Guinea, Paraguay, Peru, Philippines, Rwanda, Samoa, São Tomé and Principe, Senegal, Sierra Leone, Solomon Islands, Somalia, South Africa, South Sudan, Sri Lanka, St. Lucia, St. Vincent and the Grenadines, Sudan, Suriname, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Turkmenistan, Tuvalu, Uganda, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic), Vietnam, Yemen Republic, Zambia, Zimbabwe.

Konzorcium elvárások:

Csak konzorciumok pályázhatnak!

Feltéve, hogy nincs sajátos elvárás a felhívásban, csak olyan konzorciumok pályázhatnak, amelynek minimum 3 egymástól független tagja van, amelyből min. 1 uniós tagállamban van bejegyezve és a minimum másik kettő más-más tagállamban vagy társult országban lett bejegyezve.

„at least one independent legal entity established in a Member State; and at least two other independent legal entities, each established in different Member States or Associated Countries."

Nemzetközi partnerkeresés: funding and tenders portálon + NCP-k révén

Támogatás mértéke

- The grant parameters (maximum grant amount, funding rate, total eligible costs, etc.) will be fixed in the grant agreement (Data Sheet, point 3 and Article 5).
- The project budget is provided in EUR.
- The amount of the grant awarded may be lower than the amount requested. This means that it will reimburse ONLY certain types of costs (eligible costs) and ONLY those costs actually incurred for the project (NOT the budgeted costs).
- Grants may NOT produce a profit. If there is a profit (i.e. surplus of revenues + EU grant over costs), it will be deducted from the final grant amount.
- **Research and innovation action (RIA): 100%**
- **Innovation action (IA): 70% (except for non-profit legal entities, where a rate of up to 100% applies)**

IA/RIA és a TRL

Research and innovation actions (RIA) —Olyan tevékenységek, amelyek célja új ismeretek, egy új vagy fejlettebb technológia, folyamat, termék, szolgáltatás vagy megoldás megvalósítása. Ez lehet alap vagy alkalmazott kutatás, technológia-fejlesztés és integrálás, tesztelés, demonstrálás és validálás kis léptékű prototípusoknál laboratóriumban vagy szimulált környezetben.

Innovation actions (IA) — Olyan tevékenységek, amelyek közvetlenül új, átalakított vagy fejlettebb termékek, folyamatok és szolgáltatásokra vonatkozó elképzelések, előkészületek és tervek megvalósítását célozzák. Ide tartoznak a prototípus készítés, tesztelés, pilot, nagy léptékű termék validálás és piaci replikálás.

TRL: technology readiness level (https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-13-general-annexes_horizon-2023-2024_en.pdf)

(Bizottsági útmutatások: *TRL Guiding principles for Renewable Technologies; Guiding notes to use the TRL selfassessment tool)*

Magyarul 'technológiai fejlettségi szint' a technológia értettségét méri.

TRL1- alapelvek megfogalmazása
TRL2- a technológiai elképzelés megfogalmazása
TRL3- kísérleti ellenőrzése a tudományos megközelítésnek
TRL4 - technológia validálás laboratóriumi körülmények között
TRL5 - technológia validálás a releváns ipari környezetben kulcs alaptechnológiák esetén
TRL6 - technológia demonstrálás releváns ipari környezetben kulcs alaptechnológiák esetén
TRL7 - prototípus rendszer bemutatása működési környezetében kulcs alaptechnológiák esetén
TRL8 - a rendszer teljes és minősített
TRL9- a rendszer ki lett próbálva működési környezetében

Kik az értékelők?

Ön is lehet értékelő!

(tapasztalatszerzési lehetőség)

Work as an expert

he European Union Institutions appoint external experts to assist in the evaluation of grant applications, projects and tenders, and to provide opinions and advice in specific cases.

In particular, experts assist in:

- **Evaluation** of proposals, prize applications and tenders
- **Monitoring** of actions, grant agreements, public procurement contracts

In addition, experts provide opinion and advise on:

- **Preparation, implementation and evaluation of EU programmes and design of policies.**

In order to select experts, the European Union Institutions publish regularly calls for expression of interest (see list below) detailing the selection criteria, the required expertise, the description of the tasks, their duration and the conditions of remuneration.

Interested? Please join the database of external experts!

Register as expert

As new expert, you will be first requested to create your EU login account and register your profile.

Registered experts can update the profile via the My Expert Area after **login**.

Calls for expressions of interest for experts

- Call for expressions of interest for experts (2021-2027)
- Calls for expressions of interest for experts (2014-2020)

Excellence – Impact –Quality and efficiency of implementation

Kiválóság:

- **a projekt célja** mennyire világos és meghatározott, ambiciózus és **milyen mértékben lépi át a kutatás és innováció jelenlegi eredményeit** (state of the art);
- **a módszertan** mennyire világos, fogalmak szintjén, tudomány feltételezések szintjén, mennyire interdiszciplináris, mennyire van tekintettel a nemek arányos képviseletére., az open-science gyakorlat minősége, a kutatás menedzsment és az eredmények közzététele, az innovációs output, mennyire vonja be a civil társadalmat és a végfelhasználókat.

Hatás:

- **mértéke és jelentősége az eredményeknek és hatásoknak,** beleértve a transznacionális együttműködés hozzáadott értékét; hihetősége annak, hogy a munkaprogramban betervezett célkitűzések és hatások megvalósíthatók (megvalósíthatóság);
- alkalmassága és minősége az intézkedéseknek, amelyek az eredmények maximalizálását szolgálják, a hasznosítási és népszerűsítési tervnek megfelelően, beleértve az eredményekre vonatkozó kommunikációt;
- projekt hozzájárulása az energia-átmenethez, a végső felhasználók, privátszféra és a 'need-owners'-ek megfelelő bevonásával;

A megvalósítás minősége és hatékonysága:

- a munkaterv minősége és hatékonysága, a kockázatelemzés, a munkacsomagok és erőforrások megfelelő súlyozása;
- szerepe és minősége mindegyik résztvevőnek és, hogy a konzorcium milyen mértékben tudja a szükséges szakértelmet biztosítani.

Utólagos csatlakozás lehetősége nyertes projektekhez – widening

A munkaprogramban olvasható a hop-on felhívásokról:
Widening hop-on: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-11-widening-participation-and-strengthening-the-european-research-area_horizon-2023-2024_en.pdf

A hop-onra pályázható projektek listája:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon/hop-on

További információs lehetőségek

HORIZON EUROPE CLUSTER 5 Info Day (aktuális pályázati felhívásokról) : 2023 október 17 (online) Horizon Europe Info Days - Cluster 5 – Parallel session 3 - Streaming Service of the European Commission (europa.eu)

Partnerkeresés – NKFIH NCP-én keresztül is (továbbítjuk a többi NCP-nek)

Kérdések tisztázása a felhívás kapcsán:

a) Research Inquiry Platform – közvetlenül pályázóknak (válasz több hét)

b) NKFIH NCP-én keresztül is (továbbítjuk a többi NCP-nek) (válasz 2-3 nap)

c) mások által intézett kérdések és bizottsági válaszok a Funding and Tender portálon

NKFIH energetikai hírlevél (3 havonta)

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-03:

- Is the "intermediate energy carriers" mentioned in the text include "intermediates" that are final products and that may be used as fuel without further purification/processing? The call specifies that: *the finished quality is expected to be suitable so that the intermediates can be either directly upgraded in existing refinery infrastructures and/or further purified and processed in existing chemical infrastructures to drop-in liquid and gaseous advanced biofuels and synthetic renewable fuels, or directly used for shipping propulsion or in other off-road transport.* The final products are the intermediates and not the upgraded fuels. Some direct uses like off-road transport or shipping are possible as these may handle intermediates.
- Are jet-fuel acceptable? Jet fuels are not acceptable.
- Is the aviation sector included as a target of this topic? In other words, how should the expression "off-road transport" be interpreted?The call specifies that the finished quality is expected to be suitable so that the intermediates can be either directly upgraded in existing refinery infrastructures and/or further purified and processed in existing chemical infrastructures to drop-in liquid and gaseous advanced biofuels and synthetic renewable fuels, or directly used for shipping propulsion or in other off-road transport. The final products are the intermediates and not the upgraded fuels. Some direct uses like off-road transport (as for example in agricultural machinery) or shipping are possible as these may handle intermediates. Final aviation renewable fuels are not acceptable, intermediates that can be converted to final aviation renewable fuels are eligible. Examples of intermediates are provided in the text of the topic.
- Is it in scope to investigate other sources of CO2 in addition to biogenic sources?CO2 can be of any origin, as it does not carry energy.
- Is in the scope of the topic to investigate new feedstock sources for refineries? The scope of the topic is described in the call. The aim is to upgrade the intermediates.

HORIZON-CL5-2024-D3-01-05:

- Is biogenic CO2 from the upgrading process of biogas in the scope of the call? No, CO2 from upgrading of biogas to biomethane is not in scope, as no prior combustion of the biogas takes place and the use of "*effluent gases from bioenergy combustion systems*" is required.

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-07:

- Should the life cycle perspective be applied to all materials involved in the process, including eventual waste material from a refurbished plant, or is it sufficient to consider only new materials used in the process?The proposed solution should be addressed on a life cycle basis. In particular, circularity by design refers to the proposed solution. While not mandatory, if waste material from the refurbished plant can be recycled and reused, this is in line with the circularity concept, which can be included.
- The topic does not specify the scale of the hydropower facilities addressed. Does it mostly focus on the refurbishment of large-scale hydropower plants or are small-scale plants equally in scope? Indeed, the size of the hydropower plant is not prescribed and can include both small and large.
- Clarification on the sentence: "The selected projects are expected to contribute to the BRIDGE initiative, actively participate to its activities and allocate up to 2% of their budgets to that end. Additional contributions to the 'Alliance for …"The aim of the Bridge initiative is to increase the impact of projects in 2 ways: to exchange experiences and best practices among projects so that they can build on each other's work and cooperate across projects;to provide input to EU-level policy discussions based on coordinated and aggregated feedback from projects so that policy actions benefit from project experience and evidence. Projects are expected to support the provision of advice and evidence for EU policy making by taking an active role in at least one of the Bridge working groups, by contributing to its annual work programme and related reports. They would also be expected to participate in the Bridge annual general assembly and, more generally, by sharing experiences and best practices with the other Bridge member projects. Applicants could already specify in their application the activities and the fields of interests for the cooperation with the Bridge initiative. Applicants are not expected to contact the Bridge secretariat during the proposal preparation but only when the project has been awarded.

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-10:

- Is the use of waste heat treated as a reduction in fossil fuel consumption?As the expected outcomes state, the topic aims to create "Available breakthrough and game changing renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050". Simply introducing a change in an industrial process, while interesting, does not have at first glance the high-risk component asked for in the topic. The scope requires, by default, the use of renewable energy in the process to produce the electrons to drive the process. Electrochemistry using directly renewable energy to produce the electrons to drive the process is allowed. Using electricity to drive the production process of hydrogen via electrolysers is excluded.
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- What does "*direct utilization of renewable energy sources*" mean? The renewable energy source is converted into use (heat, cooling, fuels, work) without intermediaries being carried to the use. In that respect, electricity could be produced in the case of a direct use integrated into a product or a process.

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-10:

- Should the renewable energy source be spent without converting it to electricity before its final use? Electricity can be produced if its use is integrated within the process that needs it. What is excluded as an example is producing electricity to feed an electrolyser to produce a fuel. However, using renewable energy to directly produce fuels through electrochemical process would be ok.
- Could you please give examples of "*direct utilization of renewable energy sources*"? If possible, one with "wind".Examples are imbedded power generation to processes or products. For wind, an idea could be revisiting the concept of wind energy to power mechanical devices. *"The following areas are excluded from the scope of the topic as they fall within the scope of partnerships or other calls: Material research is covered under cluster 4 topics."*
- What are the limitations with regards to the inclusion (or no inclusion) of material research in a given project? The first paragraph of the scope describes the possibilities focused on renewable energy technologies, not an overall material research development. Pure material research, i.e. developing a new material, is excluded. What is obviously included is tuning material for energy purpose like dedicated catalyst for energy conversion, like carbon reductio and water oxidation, or improved photovoltaic cells. The results of the projects are a game-changer renewable energy technology.
- Is the production of ammonia through the electrolysis of water with simultaneous reaction with nitrogen within the scope, even if hydrogen is produced as a by-product, as a one-step process in which ammonia and hydrogen are produced simultaneously (the focus being on the production of ammonia)? Indeed only hydrogen through electrolyser is excluded. However, it should be reminded that the scope of the topic is "to address high-risk/high return technology developments for **game changing renewable energy technologies**.". Developing electrolysers that can be operated with electricity from any origin is not a game changing renewable energy technology as such. However solutions like "direct utilization of renewable energy sources" through electrochemical process would be in scope. Kindly note that topic *HORIZON-CL5-2024-D2-01-04: Emerging energy technologies for a climate neutral Europe* addresses "Novel energy generation/conversion methods" that would cover electrolyser development.

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-12:

- Is it mandatory to make a demonstration at regional level? Yes, it is mandatory to make a demonstration at regional level.
- Given that a pilot is always in a concrete "local" site, how is the project expected to cover the "regional level"? The request refers to the part "*Demonstrate aggregation of multiple (building or industrial) energy management systems to provide flexibility services (wholesale market price signals, demand response, flexible production, smart charging, balancing & frequency services, congestion management) to the electricity network.*" The aim is to demonstrate at regional level how different local level pilots can work together, for example how the EMS of different buildings or industrial sites can work together. This can be regional within an Member State or across borders.
- Can we consider a heat pump producer as a home appliances producer and what exactly is the definition of an aggregator? Yes, a heat pump producer can be considered as a home appliances producer. The definition of an aggregator follows the description figuring in the EU electricity directive: 'aggregation' means a function performed by a natural or legal person who combines multiple customer loads or generated electricity for sale, purchase or auction in any electricity market; 'independent aggregator' means a market participant engaged in aggregation who is not affiliated to the customer's supplier.

Questions and answers (funding and tenders portálon)

HORIZON-CL5-2024-D3-01-14:

- Should proposers address at the same level the different parts A,B & C or rather give a focus on one of the topic A,B,C and address the two others in a less detailed way? Parts A, B and C have to be addressed, but applicants can chose to focus more on one of them as long as they can convince the evaluators that this effort distribution is the best way to address the topic.
- The expected outcome is "*Demonstration of Condition and Health Monitoring (C&HM) for converters of wind turbines generators and HVDC converter stations or MVDC converters (solar energy)*". Should only one form of energy generation - either wind or solar - be addressed in an application? The R&I topic does not address the type of energy generation, but C&HM for the PE to it associated, whatever the type of generation might be. For wind energy, we refer to the converter of the wind generator and the HVDC converter station while for PV the PE equipment involved is the MVDC. Therefore, the type of generation not being explicitly requested in the call, the proposer is free to address the PE equipment linked to wind, PV or both.

HORIZON-CL5-2024-D3-01-15:

- Projects are expected to implement at least three of the activities in (1) for one or more subtopics (A, B, C) or (2) for one or more subtopics (D, E, F)" - can you clarify?A minimum of 3 activities should be dealt with. These activities can be in A and/or B and/or C OR in D and/or E and/or F. Therefore, these minimum 3 activities can be all in one subtopic or spread between the 3 subtopics of a same point (thus 3 activities minimum).

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