AZ EU KUTATÁSI ÉS INNOVÁCIÓS PROGRAMJA 2021 – 2027

HORIZONT EURÓPA
CL5 D2
2023.02.06.

Horizont Európa Partnerségek

A Partnerségek összehozzák az Európai Bizottságot, valamint a magán- és/vagy állami partnereket, hogy összehangolt kutatási és innovációs kezdeményezések révén kezeljék Európa sürgető kihívásait (49 konstrukció).

Co-programmed European Partnership

A Bizottság és magán- (és/vagy néha állami) partnerek közötti együttműködés, amelynek az alapja **egyetértési megállapodás (MoU)**.

Finanszírozás: uniós (8 milliárd EUR támogatás a HE-n belül 2021 és 2027 között)

Pályázati kiírás: HE WP

Co-funded European Partnership

EU tagállamok együttműködése (KFI finanszírozók és más állami hatóságok), amelynek alapja a Bizottság és a konzorciumpartnerek közötti **támogatási megállapodás (Grant Agreement)**.

Finanszírozás: uniós és nemzeti

Pályázati kiírás: co-fund projekten és finanszírozó szervezeteken keresztül

Institutionalised European Partnership

A Bizottság, az EU tagállamai és/vagy az ipar közötti együttműködés, amely a Bizottság jogalkotási javaslatain alapul. Integrált, önálló, központosított menedzsment szervezet (**Joint Undertaking**).

Finanszírozás: uniós és ipari (esetenként tagállami)

Pályázati kiírás: JU felhívásai

BATT4EU Batteries European Partnership
Built4People
2ZERO
Water4All Water security for the planet
DUT Driving Urban Transitions
Europe's Rail
Clean Hydrogen Partnership
CCAM Connected, Cooperative & Automated Mobility
biodiversa+ European Biodiversity Partnership
CLEAN AVIATION
Circular Bio-based Europe Joint Undertaking

Akkumulátorok Európai Partnersége

- Szerződéses „public-private” partnerség – a közszféra oldalán az Európai Bizottság, magánoldalon pedig a BEPA, amely az európai kutatási közösség összes elemét tömöríti.
- Egyetértési Megállapodás (MoU) aláírása: 2021. június 23-án, az Európai Kutatási és Innovációs Napok alkalmával → hivatalosan elindult a BATT4EU-t

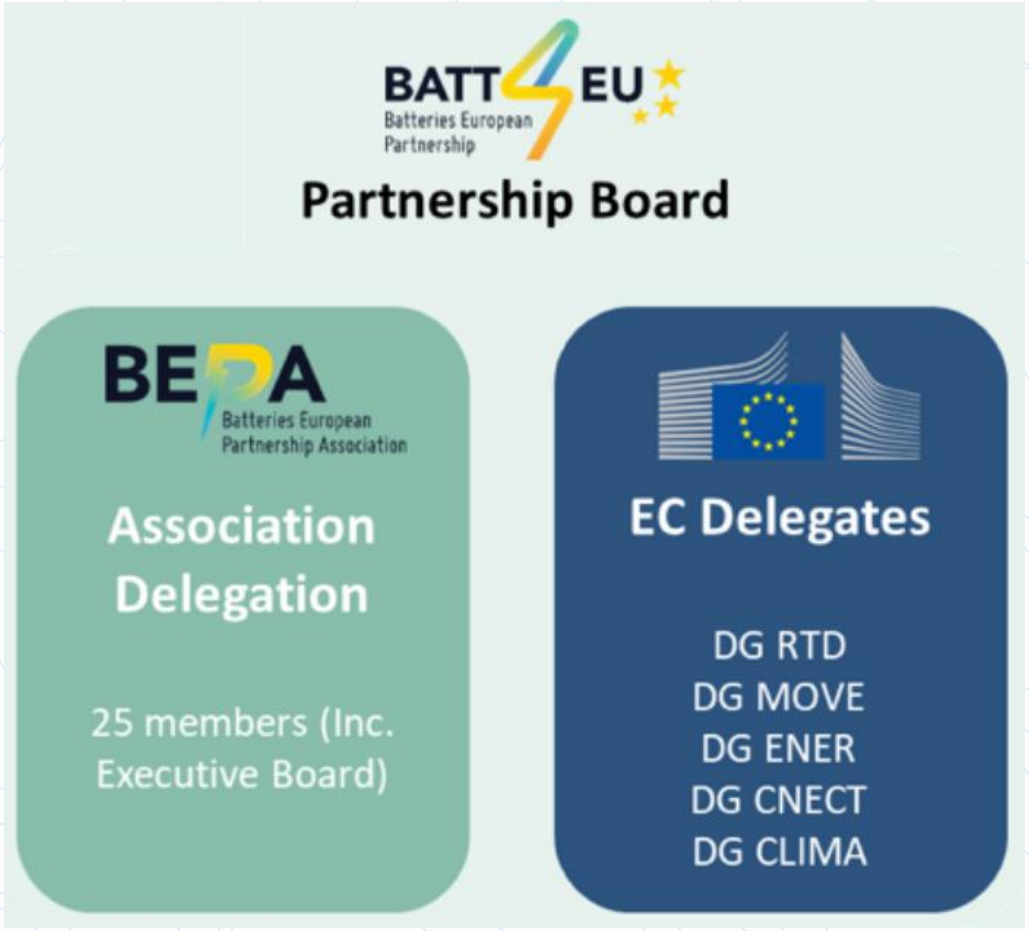
Akkumulátorok Európai Partnerségének Szövetsége: nemzetközi non-profit szervezet

A BEPA fő tevékenysége: inputot és tanácsot ad az Európai Bizottságnak:

- hozzájárul a kutatási és innovációs tevékenységek meghatározásához
- hozzájárul a HE munkaprogramok pályázati témáinak meghatározásához

Akkumulátorok Európai Partnersége

A BATT4EU-t a Partnerségi Tanács irányítja, amely a BEPA Szövetségi Delegációjából és az Európai Bizottság küldötteiből áll.



A BATT4EU víziója az, hogy 2030-ra Európában létrehozza a világ legjobb innovációs ökoszisztémáját a versenyképes, fenntartható és körforgásos európai akkumulátor-értéklánc fellendítése érdekében az e-mobilitás és a helyhez kötött alkalmazások terén.

BEPA
Batteries European Partnership Association

Konkrét célkitűzések (Specific Objectives)

Az akkumulátor-anyagok, a cellatervezés és -gyártás, valamint az akkumulátor-újrahasznosítás terén differenciált technológiák fejlesztésének támogatása.

A fenntartható és megfizethető akkumulátoros megoldások fejlesztésének és bevezetésének felgyorsítása a tiszta mobilitás érdekében.

A megújuló energiaforrások költséghatékony integrálása az elektromos hálózatba megfizethető akkumulátorok fejlesztésével, helyhez kötött energiatároló alkalmazásokhoz.

OPERATIONAL OBJECTIVES (by 2030)

1. increase battery **energy density** (+60% compared to 2019 values)
2. increase battery **power density and charging rate**
3. improve **cycle lifetime** (at least by a factor of 2 compared to 2019 state-of-the-art values)
4. reduce **battery cost** (-60% compared to 2019 values)
5. ensure **battery safety** in the different targeted application sectors
6. implement worldwide Best Available Technologies in **manufacturing** and **recycling** operations.
7. enhance the sustainability of the main supply chains of battery **raw materials** and achieve the lowest possible carbon footprint of the supply chain from raw materials extraction through battery manufacturing, use and recycling

Batt4EU – a teljes értéklánc lefedése

BEPA Batteries European Partnership Association

Nyersanyagok | Továbbfejlesztett anyagok | Cellák | Modulok | Csomagolások | Alkalmazási integráció* | Életciklus vége

- Aktív anyag és kapcsolódó komponensek (akkumulátor minőségű nyersanyagok, katódok, anódok, kötőanyagok, elektrolitok (különösen szilárd halmazállapotú jövőbeli elektrolitok), ezek előállításához szükséges eljárások és berendezések, valamint az anyagok és határfelületek gyorsított felfedezésének és tervezésének új módszerei).
- Egyéb anyagok (szeparátorok, burkolatok, mechanikai alkatrészek stb.)

- Cellakialakítás
- Fejlett technológiák és gyártás
- Speciális berendezések és új gyártási technológiák
- Összeszerelési technológiák

- Szén-dioxid mentes közlekedés
- Helyhez kötött energiatárolás

*A célzott partnerséggel rendelkező alkalmazási ágazatok esetében a célzott partnerség veszi át a vezetést az adott ágazatra jellemző K+I szegmensek tevékenységében.

- Újra felhasználás
- Gyűjtés, válogatás, szétszerelés és újrahasznosítás
- Másodlagos nyersanyagok

Megfelelő egyensúly a rövid és középtávú, valamint a hosszú távú K+I tevékenységek között
a piacközeli Li-ion technológiák fejlesztése (TRL 5-8)
új, ígéretes és hosszabb távon áttörést jelentő technológiai megoldások (TRL 2-4)

Akkumulátor felhívások 2023/24

- Nem szükséges a BEPA tagjának lenni - a felhívások teljesen nyitottak.
- **Pályázatok összértéke:**
  - **2023: 153 millió EUR (2 időpontra!)**
  - (2024: 127 millió EUR)
- **Pályázatok benyújtási határideje:**
  - **2023. április 18. 17:00**
  - **2023. szeptember 5. 17:00**
- **A nyitott pályázatok az előadáson tájékoztató jellegűek, a pontos információt az Európai Bizottság honlapján megtalálják!**
  - https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

Horizont Európa
Akkumulátor Partnerség – pályázati felhívások bemutatása 2023-2024

Budapest, 2023. február 06.

BATT4EU
Batteries European Partnership

Call	Budgets (EUR million)		Deadline(s)
	2023	2024	
HORIZON-CL5-2023-D2-01	111.70	16.30	18 Apr 2023
HORIZON-CL5-2023-D2-02	42.00		05 Sep 2023
HORIZON-CL5-2024-D2-01		57.00	18 Apr 2024
HORIZON-CL5-2024-D2-02		54.00	05 Sep 2024
Overall indicative budget	**153.70**	**127.30**	

HORIZON-CL5-2023-D2-01

Topics	Type of Action	Budgets (EUR million)		Expected EU contribution per project (EUR million)	Indicative number of projects expected to be funded
		2023	2024		
Opening: 13 Dec 2022 Deadline(s): 18 Apr 2023					
HORIZON-CL5-2023-D2-01-01	RIA	21.00		Around 7.00	3
HORIZON-CL5-2023-D2-01-02	RIA	15.00		Around 5.00	3
HORIZON-CL5-2023-D2-01-03	RIA	14.00		Around 7.00	2
HORIZON-CL5-2023-D2-01-04	IA	15.00		Around 7.50	2
HORIZON-CL5-2023-D2-01-05	IA	12.00		Around 6.00	2
HORIZON-CL5-2023-D2-01-06	IA	10.00		Around 10.00	1
HORIZON-CL5-2023-D2-01-07	CSA	4.00		Around 1.00	4
HORIZON-CL5-2023-D2-01-08	COFUND	20.70	16.30	Around 37.00	1
Overall indicative budget		**111.70**	**16.30**		

A competitive and sustainable European battery value chain

HORIZON-CL5-2023-D2-01

- HORIZON-CL5-2023-D2-01-01: Technologies for sustainable, cost-efficient and low carbon footprint downstream processing & production of battery-grade materials (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-01-02: New processes for upcoming recycling feeds (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-01-03: Advanced digital twins for battery cell production lines (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-01-04: Battery management system (BMS) and battery system design for stationary energy storage systems (ESS) to improve interoperability and facilitate the integration of second life batteries (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-01-05: Hybrid electric energy storage solutions for grid support and charging infrastructure (Batt4EU Partnership)
- **HORIZON-CL5-2023-D2-01-06: Open Pilot Line/Test Bed for hydrogen**
- **HORIZON-CL5-2023-D2-01-07: Support for the deployment of R&I results for climate mitigation. Synergies with the ETS Innovation Fund**
- HORIZON-CL5-2023-D2-01-08: Driving Urban Transition (DUT) Co-funded Partnership

HORIZON-CL5-2023-D2-02

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)	Indicative number of projects expected to be funded
		2023		
Opening: 04 May 2023 Deadline(s): 05 Sep 2023				
HORIZON-CL5-2023-D2-02-01	IA	24.00	Around 8.00	3
HORIZON-CL5-2023-D2-02-02	RIA	10.00	Around 5.00	2
HORIZON-CL5-2023-D2-02-03	IA	8.00	Around 8.00	1
Overall indicative budget		**42.00**		

A competitive and sustainable European battery value chain

HORIZON-CL5-2023-D2-02

- HORIZON-CL5-2023-D2-02-01: Advanced materials and cells development enabling large-scale production of Gen4 solid-state batteries for mobility applications (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-02-02: New Approaches to Develop Enhanced Safety Materials for Gen 3 Li-Ion Batteries for Mobility Applications (Batt4EU Partnership)
- HORIZON-CL5-2023-D2-02-03: Creating a digital passport to track battery materials, optimize battery performance and life, validate recycling, and promote a new business model based on data sharing (Batt4EU Partnership)

HORIZON-CL5-2024-D2-01

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)	Indicative number of projects expected to be funded
		2024		
Opening: 07 Dec 2023 Deadline(s): 18 Apr 2024				
HORIZON-CL5-2024-D2-01-01	RIA	21.00	Around 7.00	3
HORIZON-CL5-2024-D2-01-02	IA	21.00	Around 7.00	3
HORIZON-CL5-2024-D2-01-03	RIA	5.00	Around 5.00	1
HORIZON-CL5-2024-D2-01-04	RIA	10.00	1.50 to 2.50	5
Overall indicative budget		**57.00**		

A competitive and sustainable European battery value chain

HORIZON-CL5-2024-D2-01

- HORIZON-CL5-2024-D2-01-01: Advanced sustainable and safe pre-processing technologies for End-of-Life (EoL) battery recycling (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-01-02: Non-Li Sustainable Batteries with European Supply Chains for Stationary Storage (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-01-03: Development of technical and business solutions to optimise the circularity, resilience, and sustainability of the European battery value chain (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-01-04: Emerging energy technologies for a climate neutral Europe

HORIZON-CL5-2024-D2-02

Topics	Type of Action	Budgets (EUR million)	Expected EU contribution per project (EUR million)	Indicative number of projects expected to be funded
		2024		
Opening: 07 May 2024 Deadline(s): 05 Sep 2024				
HORIZON-CL5-2024-D2-02-01	IA	8.00	Around 8.00	1
HORIZON-CL5-2024-D2-02-02	RIA	15.00	Around 5.00	3
HORIZON-CL5-2024-D2-02-03	IA	16.00	Around 8.00	2
HORIZON-CL5-2024-D2-02-04	IA	15.00	Around 7.50	2
Overall indicative budget		**54.00**		

A competitive and sustainable European battery value chain

HORIZON-CL5-2024-D2-02

- HORIZON-CL5-2024-D2-02-01: Sustainable high-throughput production processes for stable lithium metal anodes for next generation batteries (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-02-02: Post-Li-ion technologies and relevant manufacturing techniques for mobility applications (Generation 5) (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-02-03: Size & weight reduction of cell and packaging of batteries system, integrating lightweight and functional materials, innovative thermal management and safe and sustainable by design approach (Batt4EU Partnership)
- HORIZON-CL5-2024-D2-02-04: Accelerated multi-physical and virtual testing for battery aging, reliability and safety evaluation (Batt4EU Partnership)

HORIZON-CL5-2023-D2-01-01

Technologies for sustainable, cost-efficient and low carbon footprint downstream processing & production of battery-grade materials

Scope: Proposals are expected to cover research and innovation activities with focus on improved battery metal and material production, refining and recovery while minimizing environmental impact of downstream processing by addressing all of the following points:

1. Developing sustainable and cost-efficient processing methods for battery-grade materials and components, coming from either primary or secondary streams and novel technologies for battery metals processing enabling the reduction of carbon footprint and other emissions while increasing energy and resource efficiency; enabling thereby vertical integration into the battery production.

2. Developing and demonstrating technologies to improve battery grade metals and materials production, refining and/or recycling with efficient and stable reagent circulation, targeting low use chemical and reducing environmental impacts from such processes while improving recovery rate/grade and yield considering the SRIA objectives and KPIs, the Green Deal objectives and the proposed Batteries Regulation where relevant.

3. Addressing zero waste and zero discharge strategies for the valorisation of the generated waste materials during the refining processes by: improving the reuse of waste where CRM are present; Increasing the sustainability of batteries materials by reducing the use of chemicals and energy use in the downstream processing considering the objectives of the proposed Batteries Regulation as evaluated by LCA or similar approaches; using safe and low impact disposal methodologies for those materials that cannot be recycled.

4. Pre-assessing recycling concepts by their life cycle sustainability and safety impacts (in line with Safe and Sustainable by Design Framework to be set by the Commission for assessing safety and sustainability of chemicals and materials and which should be considered as a reference in the proposal) and studying overall techno-economical solutions for recovery systems in order to minimize cost, environmental impact and system losses.

5. Addressing understanding of physico-chemical mechanisms for more sustainable hydrometallurgical steps in order to propose significant processes' improvements to reduce significantly water effluents quantities and chemical reagents.

6. Implementing of continuous process for cathode active materials and precursors synthesis related conditions at larger scale.

HORIZON EUROPE

HORIZON-CL5-2023-D2-01-01

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. A European economic base which is stronger, more resilient, competitive and fit for the green and digital transitions, by reducing strategic dependency on third countries for critical raw materials by promoting resource efficiency.

2. Increased European competitiveness by offering sustainable, safe, energy efficient and low carbon, water and biodiversity footprint battery materials production technologies and scalable solutions and by creating new business opportunities and circular models for European industry.

3. Battery-grade intermediates which are developed, produced and refined/purified in a sustainable and socially acceptable way, improving the competitiveness and value of European battery and mobility industries.

4. Proven technical feasibility of downstream processing for battery-grade materials at larger scale, considering economic feasibility, safety, health and regulatory targets.

5. A stronger European battery manufacturing industry, through the implementation of continuous processes related conditions at larger scale with reduced carbon emissions, increased energy efficiency and more efficient resources use; (e.g. combining secondary materials into existing primary processing).

6. Use of European post-mining (or post-extraction, in the case of e.g. geothermal fluids) primary materials and secondary material sources such as tailings (e.g., as a source of nickel, cobalt and lithium) or underutilised battery raw materials deposits and extend the local refining capacity of battery-grade materials, to reduce the dependency on imported materials and to limit supply risks.

HORIZON EUROPE

HORIZON-CL5-2023-D2-01-01

Pályázati felhívás típusa	Research & Innovation Action (RIA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	5 (a projekt végére)
Felhívás büdzsé	21 millió EUR
Várható EU hozzájárulás per projekt	7 millió EUR
Várható támogatandó projektszám	3
Fontos megjegyzés	

HORIZON-CL5-2023-D2-01-02

Tématerület: New processes for upcoming recycling feeds

Scope: Proposals should focus on improved and verified circularity of collected, dismantled and pre-treated battery waste feeds (Strong interaction with call “Advanced sustainable and safe pre-processing technologies for End-of-Life batteries recycling (2024)” is encouraged).

All recycling concepts should address waste stream(s) in question in a comprehensive manner, aiming at the maximal recovery of input elements and components, rather than selected fractions.

Focus on all concepts should be kept on recycling process development considering specific areas of improvement for each of the possible processes of battery recycling; a maximised material recovery and recycling efficiency, operational energy efficiency, less waste water, mass- and energy balance, purity of the recycled material and verified holistically decreased carbon footprint supported by life cycle assessment.

Battery development is out of the scope, interaction with other projects is, however, encouraged.

HORIZON EUROPE

HORIZON-CL5-2023-D2-01-02

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. A European economic base which is stronger, more resilient, competitive and fit for the green and digital transitions, by reducing strategic dependencies for critical raw materials by promoting a circular economy.
2. The development of recycling technologies targeting upcoming recycling feeds and producing high quality precursors, semi-products and battery materials enabling their use in the battery production and other production processes.
3. Achievement of the recycling efficiency and material recovery targets as described in the proposed Batteries Regulation by industries, especially for low metal and low material value components.
4. Recycling chains with a cost-effective process in comparison with primary materials.
5. Safeguarding of the sustainability, low CO2 footprint, low chemicals usage and minimal emissions of newly developed recycling processes.

HORIZON-CL5-2023-D2-01-02

Pályázati felhívás típusa	Research & Innovation Action (RIA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	4
Felhívás büdzsé	15 millió EUR
Várható EU hozzájárulás per projekt	5 millió EUR
Várható támogatandó projektszám	3
Fontos megjegyzés	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). The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

HORIZON-CL5-2023-D2-01-03

Tématerület: Advanced digital twins for battery cell production lines

- Scope: The battery production chain consists of diverse multi-disciplinary, rather novel processes with numerous influencing factors and interdependencies. Digital twins, as a core element of the accelerating digitisation in manufacturing, bear the potential to improve planning and operation of current and future battery production system. With their connection of advanced digital models and most up-to-date data, decision support or even autonomous control of battery production processes and process chains is enabled. First applications can be found in research and partly also in industrial practice – however, those still tend to be rather specific, covering just selected aspects of digital twins (e.g. just specific models) and are often hardly transferable between production stages and between different battery configurations in terms of the underlying IT architectures and models.

HORIZON-CL5-2023-D2-01-03

Várt eredmény (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. The understanding of digital twins as systems with automated data acquisition, connected digital models and value-adding applications.
2. The capacity to go beyond single process consideration with potential perspective on the process chain.
3. The implementation and the transfer of digital twins into existing and future battery cell production plants.
4. Safety and security, scalability, explainability, computational speed as well as contributions to sustainability of battery cell production.
5. Optimise product quality, improving the resource efficiency and, consequently, the production time and cost of battery cells in the manufacturing process at the targeted scale.

HORIZON-CL5-2023-D2-01-03

Pályázati felhívás típusa	Research & Innovation Action (RIA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	4-5
Felhívás büdzsé	14 millió EUR
Várható EU hozzájárulás per projekt	7 millió EUR
Várható támogatandó projektszám	2
Fontos megjegyzés	A pályázati javaslatnak ki kell terjednie a BATTERY 2030+ nagyszabású kezdeményezéshez való hozzájárulásra és együttműködésre is.

HORIZON-CL5-2023-D2-01-04

Tématerület: Battery management system (BMS) and battery system design for stationary energy storage systems (ESS) to improve interoperability and facilitate the integration of second life batteries

Scope: This topic aims at developing an open and interoperable BMS and suitable battery system design for stationary ESS, enabling a better integration of second life applications for used batteries. To strengthen European battery production ecosystem, projects are encouraged to implement batteries produced in Europe, especially with respect to 1st life batteries, at large or pilot plant scale.

HORIZON-CL5-2023-D2-01-04

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. Battery pack and Battery Management System (BMS) design for single module operation or recombination (reconfiguration) of modules or battery packs for consolidated and new battery technologies.
2. Safe, accessible and reliable operation of batteries and compatible with the battery passport concept.
3. Battery system design to enable disassembly and reconfiguration for second life.
4. Development of fast and efficient qualification strategies and assessment of Electric Vehicle (EV) batteries for second life applications and quantify it with respect to state of the art in terms of time and efficiency.
5. Reduction of 30% of repurposing/refurbishment cost for adapting EV batteries to stationary applications in second life.
6. Environmental impact assessment, from both positive and negative aspects, for adapting EV batteries to second life applications.
7. Impact in the European economy by a growth of the market and employment, by facilitating the uptake of stationary ESS Feasibility of operation in the batteries extended life domain (second life).

HORIZON-CL5-2023-D2-01-04

Pályázati felhívás típusa	Innovation Action (IA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	6-7
Felhívás büdzsé	15 millió EUR
Várható EU hozzájárulás per projekt	7,5 millió EUR
Várható támogatandó projektszám	2
Fontos megjegyzés	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). The Joint Research Centre (JRC) may participate as member of the consortium selected for funding.

HORIZON-CL5-2023-D2-01-05

Tématerület: Hybrid electric energy storage solutions for grid support and charging infrastructure

Scope: The objective is to design and demonstrate in at least three different use cases a Hybrid Energy Storage System (HESS) capable of long duration storage and provision of multiple services for supporting the electrical grid and EV charging infrastructure.

HORIZON-CL5-2023-D2-01-05

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. Demonstration of hybrid energy storage technologies for long duration storage (from at least 12 hours to days) and provision of multiple grid services with improved technical performances (increased power and energy density with respect to single electrical energy storage system +20%, reduced storage system losses -10%, improved HESS cycle life +15%, improved reliability and availability +15%), sustainability, as well as increased safety during operation, transport and storage.
2. Enable improved levelized cost of storage supported by design optimisation and optimal service stacking, putting the cost of storage on the path to fall below 0.05 €/kWh/cycle by 2030 (for storage durations > 12 hours) while reducing the use of critical raw materials (CRMs).
3. Creating synergies between producers and strengthening the European Battery Ecosystem, improving the European battery value chain and thus contributing to the EU climate neutrality objectives.
4. Increasing digitalisation of energy storage systems from design to operation phase enabling a faster development and optimal use in grid applications.
5. The establishment of multi-service approaches to energy storage reducing costs and increasing benefits for the European electricity system.
6. Promoting an increased reliability and resilience of the electricity system by demonstrating new multi-purpose energy storage solutions.

HORIZON-CL5-2023-D2-01-05

Pályázati felhívás típusa	Innovation Action (IA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	7
Felhívás büdzsé	12 millió EUR
Várható EU hozzájárulás per projekt	6 millió EUR
Várható támogatandó projektszám	2

HORIZON-CL5-2023-D2-01-06

Tématerület: Open Pilot Line/Test Bed for hydrogen

Scope: The Staff Working Document on hydrogen highlighting the EU R&I support for implementing the Green Deal hydrogen strategy and contributing to a roadmap of actions called for better synergies at European and national level as well as between European and Member States programmes and activities. A single-entry approach for testing hydrogen production technology was identified as the Open Innovation Test Bed (OITB).

Open Innovation Test Beds were first conceived in the Horizon 2020 work programme. They are entities, established in at least three Member States or Associated Countries, offering access to physical facilities, capabilities and services required for the development, testing and upscaling of technology in industrial environments. OITBs will upgrade existing or support the setting of new public and private test beds, pilot lines, and demonstrators to develop, test and upscale technologies and services for new innovative products for specific technology domains.

The applicants are required to implement the set-up of an Open Innovation Test Bed (OITB) for hydrogen production technologies.

HORIZON-CL5-2023-D2-01-06

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. Contribute to the goals of the European Hydrogen strategy to support the European Green Deal and progress towards climate neutrality by 2030.
2. Provide services for testing innovative hydrogen production technology leading to technology upscaling, reducing cost, accelerating time to the market, and reducing investment risk.
3. Contribute to the creation of an industrial ecosystem of green hydrogen production technology providers.

HORIZON-CL5-2023-D2-01-06

Pályázati felhívás típusa	Innovation Action (IA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	-
Felhívás büdzsé	10 millió EUR
Várható EU hozzájárulás per projekt	10 millió EUR
Várható támogatandó projektszám	1

HORIZON-CL5-2023-D2-01-07

Tématerület: Support for the deployment of R&I results for climate mitigation. Synergies with the ETS Innovation Fund

Scope: The aim of this topic is to promote and facilitate technologically, financially, and operationally mature projects from Horizon 2020 to reach deployment phase by means of developing synergies with other EU funding programmes, namely the ETS Innovation Fund. The topic aims to support four separate coordination and support actions (CSA), each respectively focusing on one of the following areas:

- Low-carbon technologies in energy-intensive industries,
- Carbon capture, use and storage (CCUS),
- Renewable energy generation,
- Energy storage & hydrogen.

HORIZON-CL5-2023-D2-01-07

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. Further developing the innovation pipeline from system demonstration to deployment stage for innovation in the EU and Associated Countries.
2. Developing scientifically sound mature proposals for the deployment of technological solutions to reduce Greenhouse Gas emissions.
3. Establishing synergies between different EU R&I funding programmes.
4. Contribute to the REPowerEU plan, as well as the overall EU climate targets.

HORIZON-CL5-2023-D2-01-07

Pályázati felhívás típusa	Coordination and Support Actions (CSA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	-
Felhívás büdzsé	4 millió EUR
Várható EU hozzájárulás per projekt	1 millió EUR
Várható támogatandó projektszám	4 db

HORIZON-CL5-2023-D2-02-01

Advanced materials and cells development enabling large-scale production of Gen4 solid-state batteries for mobility applications

Scope: Proposals are expected to cover all the following points:

1. Develop or leverage the materials-specific models and digital tools for material and cell design to identify the best combinations of materials and speed up the cell optimisation process.
2. Ensure high ionic conductivity (> 0.5mS/cm^2) and stability of the solid electrolyte.
3. Integrate high voltage cathode (> 4V) to reach the KPIs for mobility as listed in the Expected Outcomes section.
4. Propose and evaluate interfaces and coating solutions especially to suppress dendrite growth and enable a stable solid-electrolyte interphase (SEI) and cathode-electrolyte interphase (CEI).
5. Optimise the cell design with respect to all the cell components to meet high energy density objectives.
6. Anode current collectors and/or solid electrolyte capable of accommodating volume changes upon charge/discharge.
7. Demonstrate the potential for scale up of materials, cells and sustainable industrial processing methods with cells reaching a capacity of several Ah, produced in a statistical meaningful number to demonstrate the process repeatability.
8. Project publications should adhere to the guidelines for publication of research results, as laid out by the "Batteries Europe - Reporting Methodologies" report, subject to the need to maintain confidentiality for future commercial exploitation.

HORIZON-CL5-2023-D2-02-01

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

- Building on the results of earlier research projects on advanced solid-state materials, the objective of this topic is to demonstrate, at cell level, the scale-up of advanced solid-state materials for anodes, cathodes, electrolytes and, where applicable, separators with performances and costs compatible for mobility markets.
- Projects should link to ongoing Horizon Europe calls, especially **HORIZON-CL5-2021-D2-01-03: Advanced high-performance Generation 4a, 4b (solid-state) Li-ion batteries supporting electro mobility and other applications** and HORIZON_CL5-2021-D1-01-05 (Manufacturing technology development for solid-state batteries (SSB, Generations 4a - 4b batteries). Projects should also take stock of the outcomes of the projects under call LC-BAT-1-2019 (Strongly improved, highly performant ad safe all-solid-state batteries for electric vehicles).

HORIZON EUROPE

HORIZON-CL5-2023-D2-02-01

Pályázati felhívás típusa	Innovation Action (IA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	6
Felhívás büdzsé	24 M €
Várható EU hozzájárulás per projekt	8 M €
Várható támogatandó projektszám	3
Fontos megjegyzés	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).

HORIZON-CL5-2023-D2-02-02

Tématerület: New Approaches to Develop Enhanced Safety Materials for Gen 3 Li-Ion Batteries for Mobility Applications

- Scope: This topic aims at developing safer materials for high-performing cells by targeted modification in main cell components, namely the cathode, anode, separator and electrolyte. Solutions to common safety hazards have to be covered through a comprehensive design of new materials for at least three of following components:
- New cathode materials with no exothermal decomposition/reactions, reduced probability for oxygen and other gasses release, and preventing corrosion at current collector.
- New stable anode materials and electrode designs with non-swelling, or low degree of expansion over the whole cell lifetime, with no decomposition/exfoliation, high resistance against Li-dendrite formation – specially at high anode rate capabilities, and favouring the formation of a thermally stable, and low-resistivity SEI.
- New electrolyte formulations with shear thickening, flame retardant and over-charge/discharge properties, maintained high ionic conductivity, broad electrochemical stability i.e., voltage-operating window, and high onset point for Li-dendrite formation, SEI decomposition and CEI effectiveness.

HORIZON-CL5-2023-D2-02-02

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. Advanced Li-ion batteries with enhanced safety behaviour.
2. Advanced materials which lead to improved cyclability (15% increase in cyclability by 2030 compared to 2019 base levels) and operational lifetime (a doubling of lifetime by 2030 compared to 2019 base levels), whilst maintaining competitive performance for cost, energy and power density with state-of-art advanced materials for Li-ion batteries.
3. Improved sustainability and recyclability, in line with the recycled content, recycling efficiency and material recovery targets included in the proposed Batteries Regulation.
4. A defined concept for demonstrable, highly sustainable, circular manufacturing for the selected advanced materials at Gigafactory scale, with sustainability measured in terms of recognised economic, environmental, social and ethical metrics.
5. The improvement in safety has to be demonstrated at representative cell level for mobility applications by direct comparison with SOA Gen. 3 cells tested at the beginning of the project.
6. A EUCAR Hazard Level of 3 or other equivalent mobility standard should be validated.

HORIZON-CL5-2023-D2-02-02

Pályázati felhívás típusa	Research & Innovation Action (RIA)
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	5
Felhívás büdzsé	10 M €
Várható EU hozzájárulás per projekt	5 M €
Várható támogatandó projektszám	2

HORIZON-CL5-2023-D2-02-03

Creating a digital passport to track battery materials, optimize battery performance and life, validate recycling, and promote a new business model based on data sharing

Scope: The project is expected to:

1. Promote the adoption of a downstream development and implementation of a battery pack Digital Product Passport (DPP) at minimum subset design system level addressing raw materials (at least anode and cathode critical raw materials), cells and modules, which is both scalable and energy efficient.

2. Be able to facilitate real-time data recognition for different indicators and at local device - even when the battery ceases to be part of the Energy Storage System (ESS).

3. Consider the key performance indicators proposed by Batteries Europe or by the dedicated Partnerships, reflected in the Partnership Strategic Research Agenda (SRA), to guide the technology developments on the application segments and use cases that will be selected. Contribute to the related regulation standards.

4. Engage a variety of stakeholders along the whole battery value chain to assure the continuous traceability and assure that accountability will not be lost from raw or recycled raw material to first and second life and recycling.

HORIZON-CL5-2023-D2-02-03

Várt eredmények (A pályázatnak hozzá kell járulnia az összes alábbi ponthoz)

1. A European economic base which is stronger, more resilient, competitive and fit for the green and digital transitions, by reducing strategic dependencies for critical raw materials by promoting resource efficiency.
2. A Digital Product Passport (DPP), a proper tracking and blockchain solution, DLT (Distributed Ledger Technology)-solution or an equivalent solution that allows for built-in data authenticity verification, along the value chain, with no data duplication, avoiding data manipulation assuring privacy by design, with a low power consumption and promoting data interoperability.
3. A set of transparent calculation methods for the relevant battery indicators stored in the DPP, which can be used as a base to set future standards.
4. A demonstration of new business models in the different parts of the battery value chains and of circular data extraction, based on data sharing.
5. The improvement of the battery transportation and workforce safety.
6. A solution which has been tested throughout the entire battery value chain.
7. At least 2 real life pilots capable to exploit data generated by DPP and to test two of the innovative solutions proposed.

HORIZON-CL5-2023-D2-02-03

Pályázati felhívás típusa	**IA**
Technológiai felkészültségi szint (Technology Readiness Level - TRL)	7
Felhívás büdzsé	8 M €
Várható EU hozzájárulás per projekt	8 M €
Várható támogatandó projektszám	1

Köszönöm a figyelmet!

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