



This project is co-financed by the
European Union and the Republic of Turkey

Bu proje Avrupa Birliği ve Türkiye Cumhuriyeti tarafından
finanse edilmektedir



TURKEY_{in}
HORIZON 2020
COOPERATION. INNOVATION. COMPETITIVENESS

Technical Assistance for Turkey in Horizon 2020 Phase-II
EuropeAid/139098/IH/SER/TR

Turkey in Horizon 2020 II

‘Batteries Partnership Calls for 2021 & 2022’

[Dimitrios Papageorgiou](#)// TVP Solar SA

Focus Group Training 12 – BATTERIES| Towards a
competitive European industrial battery value chain for
stationary applications and e-mobility
14-15 June 2021



REPUBLIC OF TURKEY
MINISTRY OF INDUSTRY
AND TECHNOLOGY



Batteries Partnership in Horizon Europe

Pillar II: Global Challenges & European Industrial Competitiveness

Cluster 5: Climate, Energy and Mobility

- **Destination D2** - Cross-sectoral solutions for the climate transition: **supports** different cross-cutting technologies and solutions for climate, energy and mobility applications
- **Destination D5** - Clean and competitive solutions for all transport modes: **improves** the performance of transport modes & mobility solutions, and **increases** the competitiveness and climate/environmental performance of transport modes
- 2021-22: **8 + 10 topics** for Batteries Partnership (13 RIA; 2 IA; 3 CSA)
- 2021-22 for BP topics: Overall indicative budget: **297M€**

HORIZON EUROPE

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications



Pillar I EXCELLENT SCIENCE

European Research Council

Marie Skłodowska-Curie

Research Infrastructures



Pillar II GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- **Climate, Energy & Mobility**
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre



Pillar III INNOVATIVE EUROPE

European Innovation
Council

European Innovation
Ecosystems

European Institute of
Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

Widening participation & spreading excellence

Reforming & Enhancing the European R&I system



New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key Features

- Strategic orientation
- Systemic approach
- Simple architecture and toolbox
- Common set of criteria for the life-cycle

CO-PROGRAMMED

Based on Memoranda of Understanding/contractual arrangements; implemented independently by the partners and by Horizon Europe

CO-FUNDED

Based on a joint programme agreed and implemented by partners; commitment of partners for financial and in-kind contributions

INSTITUTIONALISED

Based on long-term dimension and need for high integration; partnerships based on Art 185/187 of TFEU and the EIT legal acts for 2021-2027

Destination 2: Cross-sectoral solutions for the climate transition (1/3)

Scope:

Thematic areas which are **cross-cutting** by nature and can provide key solutions for climate, energy and mobility applications

Batteries is one of these thematic areas

Destination 2: Cross-sectoral solutions for the climate transition (2/3)

Contribution to Key Strategic Orientations (**KSOs**) of HE Strategic Plan:

- (C) Making **Europe** the first digitally enabled circular, climate-neutral and sustainable **economy** (transformation of mobility, energy, construction and production systems)
- (A) Promoting **open strategic autonomy*** by **leading**; digital and green transitions through human-centred technologies and innovations
- (D) **Creating a more resilient, inclusive** and democratic **European society** (threats and disasters; inequalities; empowering citizens to act in the green and digital transitions)

* 'strategic autonomy while preserving an open economy'

Destination 2: Cross-sectoral solutions for the climate transition (3/3)

Relevant **impact areas**:

- **Industrial leadership** in key and emerging technologies that work for people
- Affordable and clean **energy**
- Smart and sustainable **transport**

Destination 5: Clean and competitive solutions for all transport modes

Scope: addresses activities that improve the climate and environmental footprint, & competitiveness, of different transport modes

Contribution to KSOs of HE Strategic Plan:

- (C) Making **Europe** the first digitally enabled circular, climate-neutral and sustainable **economy**
- (A) Promoting **open strategic autonomy**

Relevant **impact areas:**

- Industrial leadership in key and emerging technologies that work for people;
- Smart and sustainable transport

Batteries Partnership in Destination 2 (1/3)

Batteries will enable the rollout of zero-emission **mobility** and renewable **energy storage**

Strategic pathway:

- **Short to medium term:** Europe rapidly regains technological competitiveness and captures significant market share of rechargeable battery market
- **Long term:** invest in research on future battery technologies to establish Europe's long term technological leadership and industrial competitiveness

Batteries Partnership in Destination 2 (2/3)

Main impacts:

- Increased **global competitiveness** of **European battery ecosystem** through generated knowledge and leading-edge technologies in battery materials, cell design, manufacturing & recycling
- Accelerated growth of innovative, competitive and sustainable **battery manufacturing** industry in **Europe**
- Accelerated roll out of electrified mobility through:
 - Increased attractiveness for citizens and businesses
 - Offering lower price
 - Better performance and safety
 - Reliable operation of e-vehicles
 - Increased grid flexibility
 - Increased share of renewables integration

Batteries Partnership in Destination 2 (3/3)

Main impacts (continued):

- Increased **overall sustainability** and improved Life Cycle Assessment of each segment of the battery value chain
 - ✓ Developed and established innovative **recycling network** and technologies
 - ✓ Accelerated roll-out of circular designs and holistic **circular approach** for funded innovations
- Increased exploitation and reliability of batteries through **demonstration of innovative use cases** of battery integration in stationary energy storage and vehicles/vessels/aircrafts (in collaboration with other partnerships)

Overview of 2021 Call Topics

HORIZON-CL5-2021-D2-01-01

Sustainable processing, refining and recycling of raw materials

HORIZON-CL5-2021-D2-01-02

Advanced high-performance
Generation 3b (high capacity / high voltage) Li-ion batteries supporting electro mobility and other applications

HORIZON-CL5-2021-D2-01-03

Advanced high-performance Gen 4a, 4b (solid-state) Li-ion batteries ...
electro mobility and other applications

HORIZON-CL5-2021-D2-01-04

Environmentally sustainable processing techniques applied to large scale electrode and cell component manufacturing for Li ion batteries

HORIZON-CL5-2021-D2-01-05

Manufacturing technology development for solid-state batteries (SSB, Gen 4a-4b)

HORIZON-CL5-2021-D2-01-06

Sustainable, safe and efficient recycling processes

HORIZON-CL5-2021-D2-01-07 (CSA)

Support for establishment of R&I ecosystem, developing strategic forward-looking orientations to ensure future skills development, knowledge and technological leadership

HORIZON-CL5-2021-D5-01-04 (CSA)

LCA and design for sustainable circularity
- holistic approach for zero-emission mobility solutions and related battery value chain

Overview of 2022 Call Topics

HORIZON-CL5-2022-D2-01-01 (IA)

Sustainable processing and refining of battery grade graphite

HORIZON-CL5-2022-D2-01-02

Interface and electron monitoring for the engineering of new and emerging battery technologies

HORIZON-CL5-2022-D2-01-03

Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)

HORIZON-CL5-2022-D2-01-04 (IA)

Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design

HORIZON-CL5-2022-D2-01-05

Next gen technologies for high-performance & safe-by-design battery systems for transport-mobile applications

HORIZON-CL5-2022-D2-01-06

Embedding smart functionalities into battery cells (embedding sensing & self-healing functionalities to monitor & self-repair battery cells)

HORIZON-CL5-2022-D2-01-07

Digitalisation of battery testing, from cell to system level, including lifetime assessment

HORIZON-CL5-2022-D2-01-08 (CSA)

Coordination large-scale initiative on future battery tech

HORIZON-CL5-2022-D2-01-09

Physics and data-based battery management for optimised utilisation

HORIZON-CL5-2022-D2-01-10

Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling

Terminology & sources for 2021-22 Call Topics (1/2)

Raw materials

- [List of critical raw materials](#):
economic importance, supply risk
- [Circular Economy Action Plan](#)
- Tailing (residues from mining)
- Precursor materials (pCAM)

Battery technologies - materials

- [Materials Acceleration Platforms](#):
to accelerate materials discovery
- Inverse design (start from
functionality/property and find
the suitable material)
- Scale bridging

Manufacturing

- Scalable technologies
- Large-scale manufacturing (GWh
production)
- ‘Design to Manufacture’
- Generation 3b (high capacity / high
voltage) Li-ion batteries
- Generation 4a, 4b (solid-state) Li-ion
batteries

Terminology & sources for 2021-22 Call Topics (2/2)

Recycling - Circularity

- Waste valorization
- Recovery/re-use/re-purposing/reconditioning
- Upscaling
- Sorting, dismantling, second use
- Circular business models
- Circularity by design

Digitalisation – moving to a digital business, economy

FAIR data (Findable, Accessible, Interoperable, Reusable)

Battery management

Safety

- Safe-by-design

Note: For non-battery experts:
[Understanding battery specifications](#)

Batteries Partnership HE 2021-22: Wordcloud



Battery research on H2020

Projects (Cordis search)

- [SPIDER](#): Low-cost, high-density lithium-ion battery technology for electric vehicle. The new, low-cost battery is expected to bring energy density to 450 Wh/kg and power density to 800 W/kg by 2030
- [3beLiEVe](#): Delivering the 3b generation of LNMO cells for the xEV market of 2025 and beyond
- [BIG-MAP](#): Battery Interface Genome - Materials Acceleration Platform
- [ASTRABAT](#): All Solid-sTate Reliable BATtery for 2025. Economically viable and environmentally friendly mass production
- [LOLABAT](#): Long LAsTing BATtery System. New promising battery chemistry, RNZB (rechargeable NiZn Battery)
- [ECO2LIB](#): Ecologically and Economically viable Production and Recycling of Lithium-Ion Batteries
- [SPARTACUS](#): Spatially resolved acoustic, mechanical and ultrasonic sensing for smart batteries.

Batteries2030+

LARGE-SCALE RESEARCH INITIATIVE



BIG-MAP

INSTA**BAT**

sens**ibat**



SPARTACUS

HIDDEN

 **BAT4EVER**
this project is funded by the European Union

Contact:

Office Address

*Turkey in Horizon 2020 Project
And Sokak 8/12 Akasya Apt. 06680 Çankaya/Ankara*

06520 Çankaya/Ankara,Turkey

Tel: +90 312 467 61 40

<http://www.turkeyinh2020.eu/>

info@TurkeyinH2020.eu



REPUBLIC OF TURKEY
MINISTRY OF INDUSTRY
AND TECHNOLOGY

