BEPA ACTIVITY REPORT 2021





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1 D INTRODUCTION



Philippe Jacques Secretary General

WELCOME BY BEPA SECRETARY GENERAL, PHILIPPE JACQUES

Batteries are central to achieve the goals of the European Green Deal. Battery-driven electric vehicles are slated to soon become ubiquitous on key European roads, taking over fossil fuel powered ones. Simultaneously, other forms of transport, like rail, waterborne and aviation are developing their use-cases for electric drivetrains based on high-performing battery technology. The stationary storage market is also on the rise, further accelerating sustainability efforts by opening up for second life batteries.

Such growth can only be accommodated by a collective and coordinated effort to foster Research and Innovation in the field of batteries; this will lead to new application fields for emerging technologies, and to an upscale of battery production processes in the short-term.

On these grounds, the Batt4EU European Partnership was officially launched in June 2021 to combine the efforts of the European Commission and of the 183 research and industry stakeholders from the entire battery value chain, all united under the Batteries European Partnership Association (BEPA). Between 2021 and 2027, the European Commission will invest a total of 925 million € in battery R&I through the Horizon Europe Batt4EU calls.

Already at the establishment of the Batt4EU Partnership stage, BEPA members have been invited to contribute to the elaboration of the Batt4EU Strategic Research and Innovation Agenda, a document which underlines the key R&I areas to be tackled first. To ensure a successful delivery of results, the Partnership has been working hand-in-hand with other European initiatives. Further developing

the roadmaps blueprinted by the ETIP Batteries Europe and the Battery2030+ initiative, Batt4EU has also reached out to Partnerships involved with the battery applications sector (e.g. 2Zero Road Transport, the Zero-Emission Waterborne Transport Europe's Rail partnerships). These collaborations will intensify further in 2022 and beyond. Together with the two Important Projects of Common European Interest (IPCEI) on batteries and other European, National and regional initiatives from the various parts of the value chain, BEPA will support the expansion/development of giga-factories across the continent to achieve the Batt4EU's objectives, specially by rapidly turning knowledge into valuable innovations.

Although the crucial role of batteries is now well acknowledged and often reminded in EU policy discussions, Europe is still facing important challenges, including within the R&I domain. Against a background of a global race for technological leadership, Europe needs to significantly improve the technical performance of its batteries and slash costs related to the production of new and better manufactured technologies.

The Batt4EU Partnership, therefore, plays a central role in Europe in reinforcing R&I globally and supporting the industry's ambition. BEPA and the Batt4EU Partnership have gotten off to a flying start. This report looks back at the greatest achievements of the association in 2021 and looks into how the association will develop in 2022 to meet all the challenges.



2 WHAT IS BEPA?

THE BATTERIES EUROPEAN PARTNERSHIP ASSOCIATION (BEPA)

The Batteries European Partnership Association (BEPA) is the private-side association of the Batt4EU Partnership, a co-programmed partnership under the Horizon Europe R&I programme driving research towards a more competitive, sustainable and circular European battery value-chain. The Batt4EU Partnership therefore gathers – on the public side – the European Commission, and - on the private side – BEPA, on behalf of all its members.

The co-programmed partnerships under Horizon Europe are the brand-new tool grounded in the intent to build a long-lasting and coordinated effort among Industry, Research and the public sector's leading voices. By leveraging Europe's resources and knowledge, the development, industrialisation and deployment of strategic technologies can be accelerated so as to build the best-in-class innovation ecosystem for batteries in Europe by 2030.

One of BEPA's main missions is to identify, prioritise and draft the R&I topics to be included in the Horizon Europe Work Programmes. This is done within the framework of the Strategic Research and Innovation Agenda (SRIA), of the BATT4EU Partnership and in alignment with the three specific objectives defined in the Batt4EU Memorandum of Understanding:



To ensure a fair representation of all the segments of the value-chain, BEPA's governing bodies (Executive Board, Association Delegation) are composed of representatives and delegates coming from different industrial sectors: raw materials, advanced materials, cell design and manufacturing, battery applications and recycling, and from Research organisations.

Since its first statutory General Assembly, in December 2020, BEPA has gathered more than 183 members and already achieved important milestones. A key step in this perspective is the elaboration of the battery calls for proposals included in the Horizon Europe Work Programme 2021-2022. On the other hand, BEPA also proposes to its members additional activities including: networking and match-making opportunities, the possibility to be involved in dedicated to non-technical aspects (Innovation uptake; Education and skills development), participation in annual conference and thematic workshops, collaborations with other European Partnerships, etc.



Support the development of differentiating technologies in battery materials, cell design and manufacturing and battery recycling.

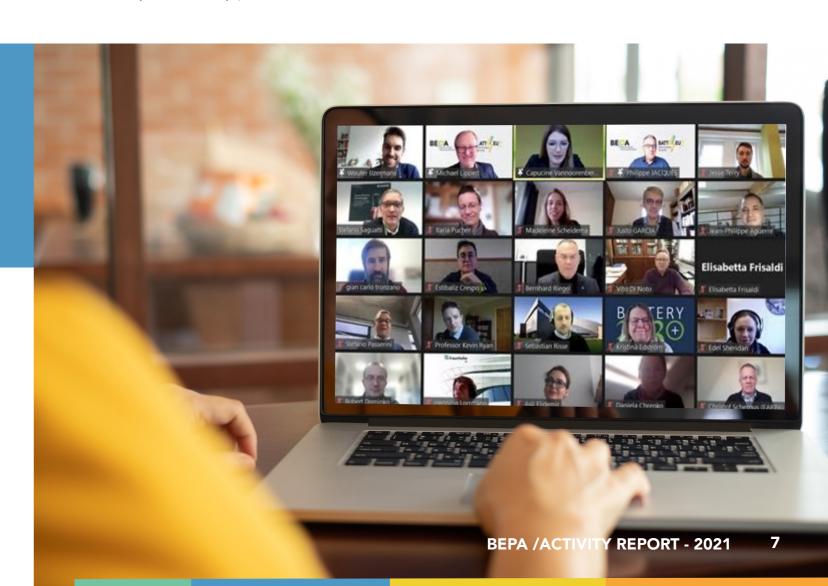


Accelerate the development and deployment of sustainable and affordable battery solutions for clean mobility.



Enable a cost-effective integration of renewable energy sources in the power grid, by developing affordable batteries for stationary energy storage applications.

To achieve these objectives, the Batt4EU Partnership is covering all the different segments of the battery value-chain: from raw materials to recycling and end-of life aspects. However, while R&I must be conducted across the entire value chain, advanced materials development, battery cell design & manufacturing and end-of-life management are seen as key activities for which a well-structured coordination will allow Europe to develop the most differentiating technologies.



3 HORIZON EUROPE WORK PROGRAMMES

Officially signed in June 2021, the Memorandum of Understanding between BEPA and the European Commission states that the European Commission envisages to dedicate up to EUR 925 million to actions within the scope of the Batt4EU Partnership.

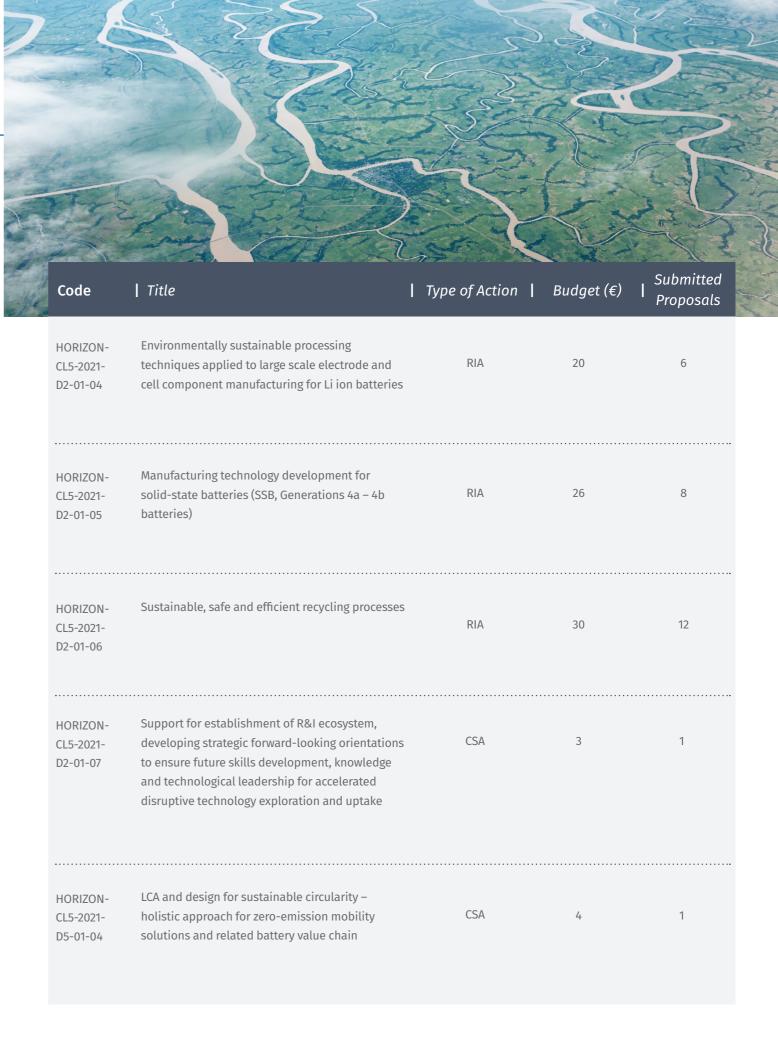
Within this framework, one of BEPA's main missions is to provide input and advice to the European Commission in order to contribute to the identification of priorities for R&I activities and the definition of call topics to be included in the Horizon Europe Work Programmes.

During 2020, a temporary Battery Partnership Shadow Group was put in place while BEPA gathered the private-side stakeholders of the European battery community. It included industry and research actors representing different segments of the battery value chain who were already well engaged with EU R&I policy and who could become active members of the partnership's private-side association. Between September 2020 and February 2021, this temporary Shadow Group elaborated a list of battery topics seen as the most urgent R&I priorities to be addressed in the Horizon Europe 2021-22 Work Programme. With the consultation of a large number of external stakeholders and in co-creation with the European Commission, the first Batt4EU calls for proposals under Horizon Europe were finalised at the beginning of 2021 and published in June 2021 during the European Research and Innovation Days. The 2021-22 calls are summarised in the tables below.

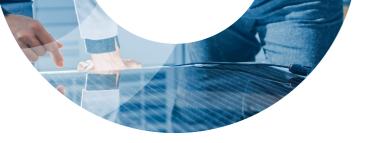
TABLE 1: BATT4EU CALLS FOR 2021

Closed on: 19 October 2021

Code	Title	Type of Action	Budget (€)	Submitted Proposals
HORIZON- CL5-2021- D2-01-01	Sustainable processing, refining and recycling of raw materials	RIA	21	7
HORIZON- CL5-2021- D2-01-02	Advanced high-performance Generation 3b (high capacity / high voltage) Li-ion batteries supporting electro mobility and other applications	RIA	24	14
HORIZON- CL5-2021- D2-01-03	Advanced high-performance Generation 4a, 4b (solidstate) Li-ion batteries supporting electromobility and other applications.	RIA	36	13



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The launch of the 2021 Batt4EU calls for proposals was already a great success. As shown in the Table 1, 61 project proposals have been submitted on the 7 different topics open for funding in 2021. The evaluation of the proposals by the European Commission started before the end of October 2021, while the list of projects selected for funding shall be published early 2022. The Batt4EU calls for 2022 (listed in Table 2) will be open for submission in April 2022.

In parallel, BEPA started the elaboration of the topics to be included in the Horizon Europe 2023-24 Work Programme. In this perspective, the association established 5 Technical Working Groups, gathering over 350 experts, and covering the different R&I areas included in the Batt4EU SRIA. Battery experts discussed within these groups what are the key

R&I priorities that could have the greatest impact on the improvement of the competitiveness and the sustainability of the battery value-chain. To do so, they did not start from scratch but used as a baseline the topics included in the Work Programme 2021-22, the priorities defined in the SRIA, but also the relevant documents published by already existing initiatives (e.g. the roadmaps of the ETIP Batteries Europe and Battery 2030+). Upon definition of a list of R&I areas of intervention which cover the whole battery value chain, the Technical Working Groups of BEPA have split into smaller drafting teams. These will finalise the draft of the battery topics which will be submitted as recommendations to the European Commission beginning of 2022.



61 project proposals have been submitted in the 7 different topics open for funding in 2021.



TABLE 2: BATT4EU CALLS FOR 2022

Opening: 28 April 2022 - Closing: 6 September 2022

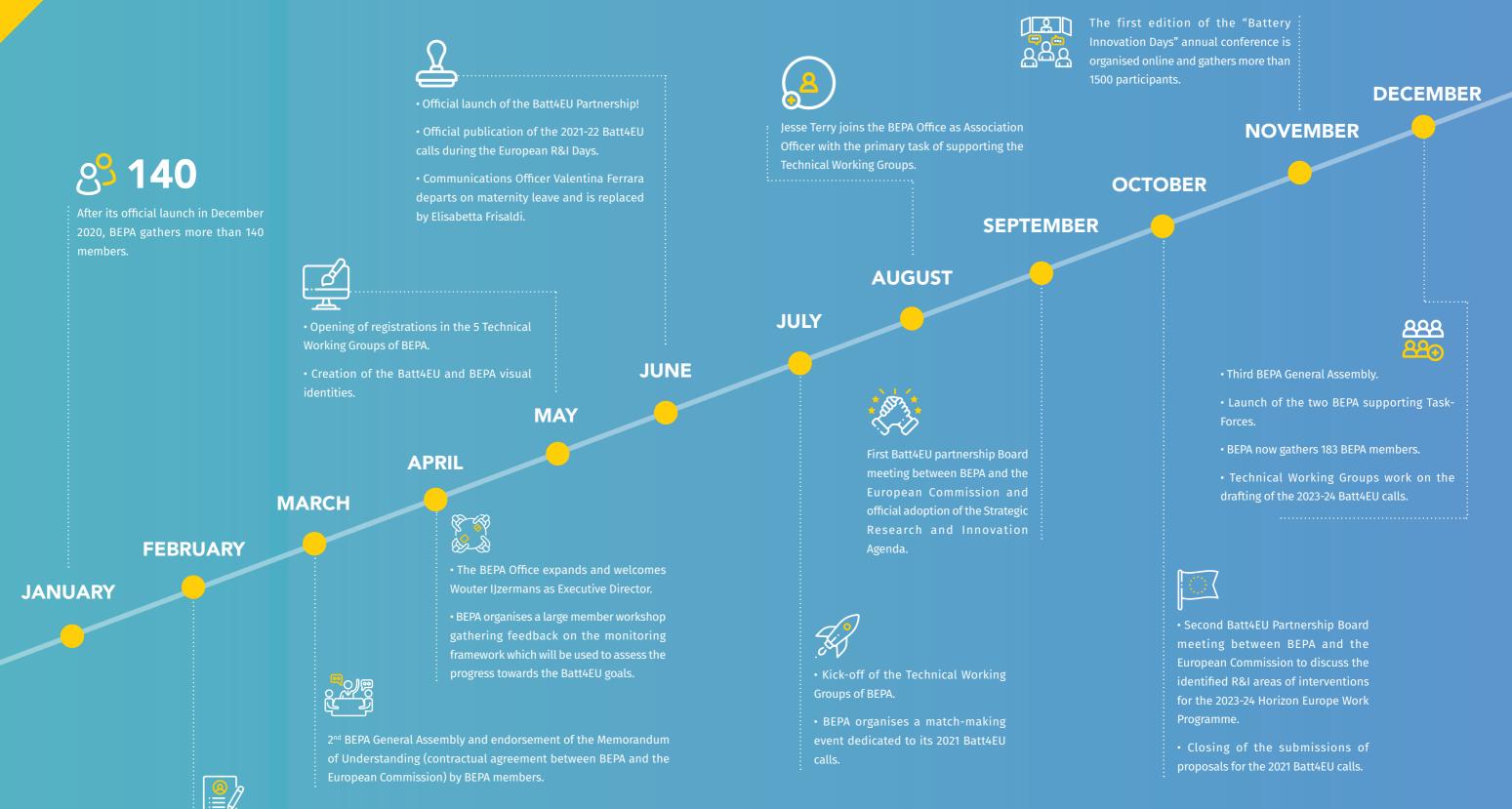
Code	Title	Type of Action	Budget (€)
HORIZON- CL5-2022- D2-01-01	Sustainable processing and refining of battery grade graphite	IA	10
HORIZON- CL5-2022- D2-01-02	Interface and electron monitoring for the engineering of new and emerging battery technologies	RIA	10
HORIZON- CL5-2022- D2-01-03	Furthering the development of a materials acceleration platform for sustainable batteries (combining AI, big data, autonomous synthesis robotics, high throughput testing)	RIA	20
HORIZON- CL5-2022- D2-01-04	Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design	IA	15
HORIZON- CL5-2022- D2-01-05	Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications	RIA	15
HORIZON- CL5-2022- D2-01-06	Embedding smart functionalities into battery cells (embedding sensing and self-healing functionalities to monitor and self-repair battery cells)	RIA	15
HORIZON- CL5-2022- D2-01-07	Digitalisation of battery testing, from cell to system level, including lifetime assessment	RIA	15
HORIZON- CL5-2022- D2-01-08	Coordination of large-scale initiative on future battery technologies	CSA	3
HORIZON- CL5-2022- D2-01-09	Physics and data-based battery management for optimised battery utilisation	RIA	15
HORIZON- CL5-2022- D2-01-10	Streamlined collection and reversed logistics, fully automated, safe and cost-efficient sorting, dismantling and second use before recycling	RIA	15

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4. 2021 TIMELINE

Batt4EU call proposals are officially provided as recommendations to the European

Commission for the Horizon Europe Work Programme 2021-22.



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5 Main activities and achievements of 2021

LAUNCH OF THE PARTNERSHIP

On 23 June 2021, during the European Research and Innovation Days, the European Commission and BEPA signed the Memorandum of Understanding, officially launching the Batt4EU Partnership – the co-programmed partnership under Horizon Europe aiming at achieving a competitive, sustainable and circular European battery value-chain.

On this occasion, Michael Lippert (BEPA Chairman) and Rosalinde van der Vlies (Director Clean Planet for DG RTD) again confirmed the "co-creation mode" which drives the work of BEPA and the European Commission in order to prepare Europe to manufacture and commercialise the next-generation battery technologies that will enable the rollout of the zero-emission mobility and renewable energy storage by 2030.

LAUNCH OF THE TECHNICAL **WORKING GROUPS**

In the course of July 2021, the 5 Technical Working Groups (TWGs) of the association, covering the whole battery valuechain, kicked-off. Currently gathering between 86 and 131 participants per group, the main mission of TWGs is to identify, prioritise and draft the R&I topics which will be submitted to the European Commission for the next Horizon Europe Work Programmes. In this context, the TWGs must consider the topics which will have the greatest impact on industrialisation and competitiveness for the European battery value-chain.

The 5 TWGs of BEPA are dedicated to the following areas:



TWG1: Raw materials and recycling



TWG2: Advanced materials and manufacturing



TWG3: Battery end-uses and applications

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TWG4: Safety & Reliability

ADOPTION OF THE BATT4EU STRATEGIC RESEARCH AND **INNOVATION AGENDA (SRIA)**

The first Partnership Board meeting was held on 15 September 2021, bringing together the BEPA Association Delegation and policy officers from different DGs of the European Commission. During this meeting, the Strategic Research and Innovation Agenda (SRIA) of the Batt4EU partnership was formally adopted. The SRIA acts as a roadmap to the achievement of the objectives set within the partnership, and details the 6 key areas of research and innovation to be addressed. These areas align with the areas of focus of the 5 technical working groups, complemented by area 6: the cross-cutting area of coordination. The SRIA is to be regularly updated by the experts in the technical working groups, to reflect the changing needs and the realities of the European battery industry.

COLLABORATION WITH OTHER EUROPEAN PARTNERSHIPS

During the course of the Technical Working Groups development of R&I topics for Horizon European Work Programme 2023-24, the BEPA Office held several meetings with other European Partnerships. During the meetings, the overall workplan was discussed to align planning, focus areas of the SRIA, as well as the development of topics which may be of interest to the other Partnerships.

Maintaining close contact with other European Partnerships is favourable for both as it increases coherence between the proposed calls, and allows for joint calls between two partnerships. Throughout the work process of Work Programme 2023-2024, BEPA was in constant contact with these Partnerships to share progress on topic development, topics that may be of interest for a potential joint call, and

BATTERY INNOVATION DAYS:

Co-organised by Batteries Europe, Battery 2030+, BEPA and the two IPCEIs on batteries. the first edition of the Battery Innovation Days took place on 23-25 November 2021. The online event brought experts from the European battery industry together over 2.5days to discuss the latest R&I developments in the battery value chain.

The event allowed participants to obtain first-hand information on the long-term R&I roadmap and latest research findings from the European battery industry, and networking opportunities were also part of the event. Recognised as a great success by the European Commission, the Battery Innovation Days conference proved the strength of the European R&I battery ecosystem working together. BEPA aims to host the Battery Innovation Days annually and, if feasible, physically in the years to come.

LAUNCH OF THE SUPPORTING TASK FORCES

In December 2021, BEPA launched two Supporting Task Forces, which will be active in 2022. These task forces strive to establish connections with other European initiatives regarding non-technical aspects essential for the establishment of a competitive battery value chain in Europe. The two supporting task forces address two

STF 1: Innovation Uptake: the objective is to create the appropriate mechanisms to support innovation uptake and help projects to successfully cross the "valley of death." It will involve developing efficient collaborations ensuring the exploitation of project results and will identify tools and opportunities to help guiding battery project coordinators toward the most appropriate strategy

to accelerate market uptake of battery technologies.

>100 >1.500 participants

STF 2: Education and Skills Development: the objective is to identify and explore the added value and the role BEPA can play in the EU ecosystem to support education and skills development. The task force will define an action plan to accompany the upcoming massive creation of jobs in the battery value-chain, and will coordinate its activities with the relevant existing initiatives that are working to boost workers' training and skills development.

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discuss challenges faced. crucial aspects of the European battery sector: TWG5: Sustainability



BATT4EU MONITORING AND REPORTING:

MONITORING FRAMEWORK

Part of the Batt4EU Memorandum of Understanding is a monitoring framework which is used to assess the progress made towards achieving the goals of the Batt4EU Partnership. This monitoring framework was developed in the first half of 2021. It was first presented during the General Assembly in March, and developed further during a BEPA member workshop in April. In 2022, this document will be reviewed by the experts of BEPA Technical Working Groups.

ANNUAL REPORT

In 2021, BEPA also started to fill in its first annual report, tracking the activities of the Partnership listed in the Memorandum of Understanding. These activities include for example the development of the battery R&I ecosystem

through new synergies and collaborations with other initiatives, the creation of networking, outreach and matchmaking opportunities, the support to the innovation uptake of battery technologies, etc.

ADDITIONAL ACTIVITIES PLAN

The Batt4EU Memorandum of Understanding states that the members of BEPA will dedicate up to EUR 925 million for the period 2021 – 2030 in battery R&I and other activities in order to match the European Union's contribution through Horizon Europe research calls. These in-kind additional activities that members are planning therefore need to be monitored and reported for the whole duration of the Partnership. At the end of 2021, the first survey aiming at estimating the in-kind additional activities of BEPA members has been launched in order to develop the first Additional Activities Plan.



6 Mhat to expect in 2022

ACCORDING TO THE WORKPLAN FOR 2022, BEPA WILL BE PERFORMING NEW INITIATIVES AND CONTINUE WITH MANY OF THE EXISTING SERVICES.

BEPA will continue its work within the Technical Working Groups, as they finish the drafting process of calls for the Work Programme 2023-24 going into the new year. After this, experts from the Technical Working Groups will update the BATT4EU SRIA and start both monitoring and assessing the EU funded project results.

After the launch of the Supporting Task Forces in December 2021, the work of the task forces will only start in 2022. Kicking off with a meeting, BEPA will manage these task forces early in the year, and throughout the following months supporting the organisation of meetings and collaborating with other initiatives.

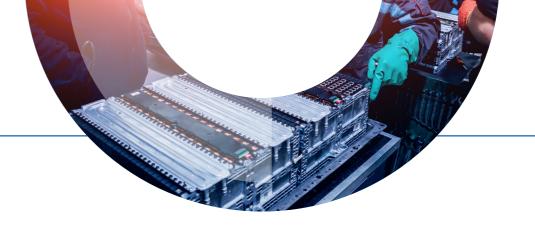


BEPA will begin the process of monitoring battery related projects and reporting of additional activities. Monitoring the battery projects of work programme 2021-22 from an early stage will ensure coherence with the efforts BEPA is putting in developing battery R&I, helping to keep the SRIA as up to date as possible, and make slight changes to the calls proposed for Work Programme 2023-24 if necessary. Additionally, the additional activities foreseen in the 1st annual plan will be monitored, to ensure the private side of the partnership is contributing to the partnership's goals.

BEPA has also planned several exciting events for 2022, with the intention of transitioning back to physical events, should the sanitary conditions allow. These events will include several General Assemblies and Association Delegation meetings, but also physical Technical Working Group meetings. Aside from the internal BEPA meetings, the Battery Innovation Days will host its 2nd edition, and additional public workshops (potentially joint with other European Partnerships) will be organised on specific issues, such as innovation uptake or match-making for the Horizon Europe calls.

Finally, BEPA will take a more active role in outreach to attract new members in the association. The outreach plan will target members from new countries which are yet not represented in the Association, mainly from central and eastern Europe. The plan also aims to attract more SME's into the association, and balance the representation of each part of the value chain by targeting more members in the raw materials and recycling industry. The plan has already been launched with an ever-growing list of potential members to attact in 2022.

7 Closing





Michael Lippert BEPA Chairman

CLOSING BY BEPA PRESIDENT, MICHAEL LIPPERT

Since its official launch in December 2020, BEPA went through a dynamic, successful and positive year. With more than 180 members now, BEPA succeeded in gathering a vast number of European battery stakeholders coming from all segments of the value-chain, including prestigious research centres and industry actors who are key to improve the competitiveness of the industry.

In 2021, the main achievements of the association were, among others, the signature of the Batt4EU Memorandum of Understanding with the European Commission which officially launched the Batt4EU Partnership. Another milestone was the formal adoption of the Strategic Research and Innovation Agenda (SRIA). BEPA also launched its 5 Technical Working Groups in charge of identifying, prioritising and drafting the next calls for proposals under Horizon Europe. Based on the recommendations submitted by BEPA, the first calls of the Work-Programme 2021-22 were published by the European Commission and received a high response rate from industry and research in all categories at their closing date in October.

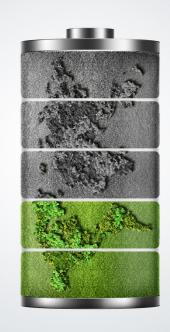
However, there are still many things in front of us. As mentioned by Rosalinde Van der Vlies (Director "Clean Planet", DG RTD of the European Commission) in the last BEPA General Assembly, it is essential to endorse the important role of the battery industry in meeting EU climate goals, to demonstrate technical leadership, and to improve competitiveness. In the next months, BEPA will develop its first Additional Activities Plan which will help understand what are concretely the industry and research activities for batteries in Europe, how much is focusing on uptake activities, what are

An important goal in 2022 will be to finalise the recommendations related to the battery topics for the Horizon Europe Work-Programme 2023-24.

the most targeted areas, etc. The European Commission and BEPA share the same common interest to make the results of this plan meaningful, showing the impact of Batt4EU on the European battery value-chain, but also to better understand in which industrial areas Europe still needs to progress.

Even if the role of batteries is already acknowledged and recognised in the context of the European Green Deal, Europe still needs to accelerate the deployment of battery solutions. These messages are coming-out from the COP26 as well, and 2030 is right around the corner. The innovation uptake is, indeed, a key aspect on which BEPA will focus next year in order to support battery stakeholders in scaling up their activities and bringing their technologies to the market. A task-force will be, thus, dedicated to this point, in parallel to the launch of the Education and Skills development task-force. The latter will help boost training and education to accompany battery stakeholders in the massive upcoming creation of battery-related jobs.

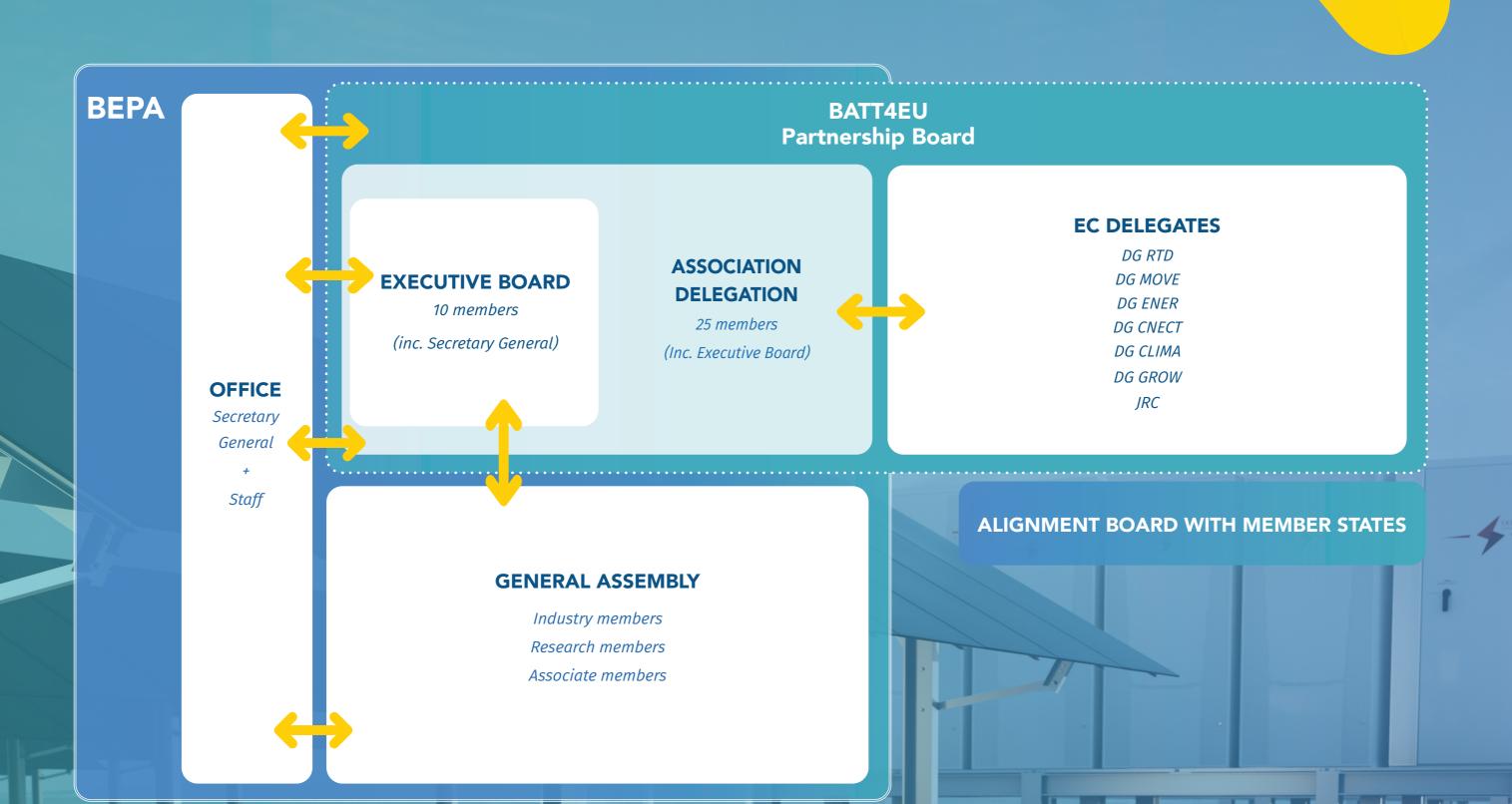
An important goal in 2022 will be to finalise the recommendations related to the battery topics for the Horizon Europe Work-Programme 2023-24. Not only, but also to look beyond and continuously update our vision of the needed R&I in Europe taking into account technical progress, market evolution and international competition. To do so, we will further strengthen our cooperation with multiple stakeholders at European and national levels and -above all- continue the effective and successful collaboration built between BEPA and the European Commission. Working together can make a real difference to strengthen EU competitiveness in the battery sector. In this perspective, I want to thank all BEPA members for their active participation that makes this Partnership a success, and want to invite all other European battery players to join BEPA in order to help boosting a competitive, sustainable and circular battery value chain in Europe.



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BEPA AND BATT4EU GOVERNANCE STRUCTURES



BEPA REPRESENTATIVES IN GOVERNING BODIES:



RAW MATERIALS



ADVANCED MATERIALS



MANUFACTURING



MANUFACTURING SUPPLY

Iani Kiuru (FINNISH MINERALS GROUP)

Madeleine Scheidema (METSO OUTOTEC)

Kurt Vandeputte (UMICORE)

Daniel Gloesener (SOLVAY)

Ilaria Pucher (GREEN ENERGY STORAGE)

Michael Lippert (SAFT)

Bernard Riegel (HOPPECKE BATTERIES

Daria Hedberg (GEYSER BATTERIES)

Olivier Colas (BLUE SOLUTIONS)

Gian Carlo Tronzano (COMAU)

Stefano Saguatti (MANZ)



RECYCLING



OTHER APPLICATIONS



AUTOMOTIVE SUPPLY



AUTOMOTIVE

Justo Garcia (ORANO MINING)

Tero Holländer (FORTUM)

uigi Lanuzza (ENFL X)

Laurent Torcheux (EDF)

Federico Cartasegna (FPT Industrial)

Christophe Petitiean (VALEO)

Franz Geyer (BMW)

Volker Hennige (AVI_LIST)



RESEARCH



Edel Sheridan (SINTEF)

Henning Lorrmann (FRAUNHOFER)

Kristina Edström (UPPSALA UNIVERSITY)

Oscar Miguel Crespo (CIDETEC)



OTHER

Secretary General: Philippe Jacques (EMIRI

LEGEND:

MEMBER OF THE EXECUTIVE BOARD AND THE ASSOCIATION DELEGATION

MEMBER OF THE ASSOCIATION DELEGATION ONLY

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BEPA OFFICE



Philippe Jacques
Secretary General



Wouter IJzermans
Executive Director



Capucine
Vannoorenberghe
Association Manager



Jesse Terry
Association Officer



Elisabetta Frisaldi
Communication Officer



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