BATTERY HEROES

WHITE PAPER

Improving the impact and sustainability of battery clusters in Europe

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LIST OF ABBREVIATIONS

BATT4EU	Batteries European Partnership
BEPA	Batteries European Partnership Association
CINEA	European Climate, Infrastructure and Environment Executive Agency
DEC	Dissemination, Exploitation and Communication
DG RTD	Directorate-General for Research and Innovation
EC	European Commission
EU	European Union
SRIA	Strategic Research and Innovation Agenda
EuroHPC	European High-Performance-Computing Joint Undertaking
FP7	Seventh Framework Programme
GAP	Grant Agreement Preparation
HPC	High-Performance-Computing
LCA	Life Cycle Assessment
PO	Project Officer
R&I	Research and Innovation
TRL	Technology Readiness Level

Executive summary

Europe's battery research and innovation landscape has seen a significant expansion of project-level clusters across successive funding cycles. Clustering has demonstrated its value – by enabling joint dissemination, cross-project learning, and strategic engagement with key institutional actors. Yet its current practice remains largely project-bound: clusters often dissolve when funding ends, valuable networks are lost, and each new generation of projects rebuilds similar structures from scratch. This cycle of fragmentation and duplication constrains the long-term return on Europe's investment in battery research and innovation.

To address this challenge, the Battery Heroes and COLLABAT clusters jointly organised a cross-cluster workshop held back-to-back with the Battery Innovation Days in Graz, Austria, in December 2025, bringing together representatives from five battery-related and one automotive cluster alongside key European stakeholders. The workshop confirmed a shared diagnosis and a broad commitment for change, resulting in four cross-cutting recommendations:

1. **Initiate clustering early and build on existing structures**
2. **Enable continuity beyond project duration**
3. **Strengthen inter-cluster cooperation**
4. **Establish structured knowledge transfer mechanisms**

This White Paper translates those recommendations into concrete proposals for action, addressed to both cluster practitioners and the key European actors best placed to enable systemic change. It calls for designated institutional focal points, a cross-institutional follow-up task force, and measurable indicators of progress – so that the momentum generated in Graz translates into lasting improvement in how Europe organises, sustains, and maximises the impact of its battery research clusters.

01

Background

On 1 December 2025, the Battery Heroes and COLLABAT clusters jointly organised a cross-cluster workshop in Graz, Austria, bringing together representatives from five battery-related and one automotive cluster, alongside key European stakeholders including the European Commission, the Batteries European Partnership Association (BEPA), LiPLANET, and Battery 2030+[1].

The workshop that was connected to the Battery Innovation Days 2025 created a dedicated space for exchange between ongoing Horizon Europe projects involved in project clusters and institutional actors working across the European battery ecosystem.

Clustering approaches have already been applied in earlier Framework Programmes (e.g. FP7) but have significantly expanded and become more structured under Horizon 2020 and Horizon Europe. New project consortia frequently establish their own cluster structures, often with similar objectives, formats, and activities. At the same time, existing clusters – despite having built valuable networks, trust, and knowledge – often dissolve once project funding ends. This dynamic leads to fragmentation, duplication of efforts, and the repeated rebuilding of collaboration structures, rather than enabling continuity and long-term impact.

Against this backdrop, the workshop aimed to bring together a critical mass of cluster initiatives and European stakeholders to reflect collectively on the role, added value, and future of clustering in Europe's battery landscape. The discussion focused on how to move beyond short-term, project-bound collaboration towards more sustainable, coordinated, and impactful approaches.

This White Paper builds on the insights generated during the workshop.

Its ambition is to capture shared experiences, identify structural challenges, and formulate practical recommendations for strengthening the impact and sustainability of battery clusters. It addresses both present and future cluster participants and representatives of the mentioned institutions and initiatives, with the goal of contributing to a more coherent, connected, and resilient battery innovation ecosystem in Europe.

1 This White Paper was drafted while Battery 2030+ was still the active coordinating initiative and therefore refers to it throughout. Since April 2026, this activity has been continued by BATT-BRIDGE, a Coordination and Support Action building on the work and legacy of Battery 2030+ and Batteries Europe. References to Battery 2030+ in this paper should therefore be understood in the context of the continued coordination activities now carried forward through BATT-BRIDGE.

02

Definition of battery clusters

For the purpose of this White Paper, **"battery clusters"** refer primarily to collaborative groupings of projects funded under the European Union's Framework Programmes, in particular Horizon Europe and its predecessors (Horizon 2020, FP7, etc.).

These clusters are typically formed by consortia working on related topics – such as battery materials, cell manufacturing, recycling, or system integration and very often by consortia funded under the same call topic ("sister projects") – with the aim of enhancing collaboration, aligning communication & dissemination activities, and increasing the overall impact of publicly funded research and innovation.

In practice, clustering sometimes extends beyond project consortia and may include additional European initiatives, platforms, or networks, where these contribute to knowledge exchange and ecosystem alignment (e.g. the Battery Heroes cluster includes a permanent representative of LiPLANET).

This White Paper focuses specifically on project-based clustering within the context of EU-funded research and innovation. It does not address industrial or regional clusters composed of companies, research organisations, or policy actors operating outside this framework, as these follow different structures, objectives, and governance models.

Positioned at the interface between publicly funded projects and European strategic frameworks, battery clusters (more so than individual projects) play a critical role in supporting the implementation of key policy objectives. These include the Batteries European Partnership (BATT4EU) Strategic Research and Innovation Agenda (SRIA), the European Green Deal, and broader EU objectives on climate neutrality, circular economy, and strategic autonomy.

By aligning project outcomes, facilitating knowledge transfer, and fostering coordinated action across initiatives, these clusters have the potential to significantly strengthen Europe's ability to translate research investments into tangible impact and long-term value for its battery ecosystem.

03

Why clustering?

Clustering of EU-funded (battery) projects has emerged as a practical and increasingly strategic approach to enhance collaboration and maximise impact during the involved projects' lifetime. Its benefits range from immediate, practical gains to deeper strategic and systemic value – with most clusters beginning at the operational level and some progressing towards broader ecosystem contributions:

AT A GLANCE — FIVE LEVELS OF BENEFIT from operational to strategic and systemic

1 Joint dissemination and communication	• Coordinated outreach activities (events, social media, promotional materials) • Stronger visibility of projects within the European battery ecosystem • More efficient use of resources for communication and stakeholder engagement • Joint Horizon Results Booster applications
2 Exchange of experience, cross-project learning, and alignment	• Informal and structured knowledge exchange between projects, through working groups or sub-clusters (e.g. on sustainability, manufacturing, digital twins) • Sharing of methodologies, challenges, and lessons learned without compromising confidentiality • Identification of synergies and complementarities, avoidance of duplication, and better alignment of activities and results across projects addressing similar topics
3 Increased impact and visibility of results	• Amplification of project outcomes through joint actions • Improved access to stakeholders, including industry and policy actors, through the collective reach of the participating projects • Greater potential for uptake and exploitation of results
4 Strategic positioning and policy contribution	• Joint engagement with European-level actors (e.g. European Commission, CINEA, BEPA, Battery 2030+) • Contribution to discussions on research priorities, policies, and future funding directions • Development of joint positions and recommendations (e.g. White Papers, policy inputs)
5 Strengthening the European battery ecosystem	• Building trust and long-term relationships across projects and organisations • Creating bridges between research, innovation, and policy • Supporting a more coordinated and coherent European approach in a globally competitive field

04

Challenges and structural gaps in current clustering practice

The discussions during the workshop revealed a set of recurring structural challenges that limit the impact, efficiency and long-term sustainability of battery clusters across Europe. While clustering has become an established practice within Horizon Europe projects, its current implementation remains largely funding-bound and fragmented.

AT A GLANCE — SIX STRUCTURAL GAPS

1. Lack of continuity beyond project lifetime
2. No dedicated resources for coordination
3. Project duration vs. clustering maturity
4. Fragmentation and duplication across funding cycles
5. No structured knowledge transfer
6. Limited alignment with institutional frameworks

1 A central challenge is the **systematic lack of continuity beyond project lifetime**. Clusters often require significant time to build trust, establish working structures, and generate meaningful exchange. However, once project funding ends, these structures frequently dissolve, leading to a loss of accumulated knowledge, networks, and collaboration momentum. As a result, each new generation of projects is forced to rebuild similar structures from scratch, creating inefficiencies and reducing overall impact.

2 Closely related is the **absence of dedicated resources for cluster coordination**. Coordination is usually carried by one participating organisation, typically from the dissemination budget of its project, and therefore depends on that organisation receiving follow-up funding and choosing to carry the role forward. Where this does not happen, the cluster often loses its driving force, even if other member projects are still running. For well-established clusters with demonstrated value, continuity should not be left to chance, yet there is currently no systematic or uniform mechanism for resourcing coordination beyond individual project lifetimes.

3 Closely linked to this is the **misalignment between project duration and clustering maturity**. With typical project timelines of three to four years, clustering activities often reach full effectiveness only towards the later stages of a project, leaving limited time to translate collaboration into tangible outcomes or long-term value.

4 Another key challenge is the **existing fragmentation and duplication of clustering efforts across successive funding cycles**. New clusters are frequently created around a new generation of projects, often addressing similar topics without systematically building on existing structures or experiences. This leads to parallel activities, inefficient use of resources, and missed opportunities for synergy. Moreover, whether newly funded projects find their way into an existing cluster currently depends largely on whether the cluster's coordinating organisation happens to be involved in follow-up projects, or on personal contacts, rather than on any structured mechanism.

5 The workshop also highlighted the **lack of structured knowledge transfer between clusters and across funding cycles**. While valuable experience and results are generated within clusters, there are currently few mechanisms to ensure their systematic handover to subsequent projects, institutions or initiatives. Knowledge exchange often depends on individual actors rather than institutionalised processes, making it inconsistent and unsustainable.

6 Finally, there is **limited alignment between clusters and key institutional frameworks**. Interaction with European-level actors such as the European Commission, CINEA, BEPA, Battery 2030+/BATT-BRIDGE, and LiPLANET varies significantly, and roles and expectations are not always clearly defined. This limits the ability of clusters to contribute effectively to broader strategic objectives and reduces the overall coherence of the European battery ecosystem.

Taken together, these challenges reflect structural characteristics of the current clustering approach rather than isolated shortcomings, and therefore require coordinated, systemic solutions.

05

Role of key European actors in supporting battery clusters

5.1 European Commission / CINEA

The European Commission together with its executive agency CINEA plays a central role as funder, framework setter, and neutral coordinator of EU research and innovation activities. The workshop discussions highlighted the need to move beyond a purely project-based approach towards a more ecosystem-oriented perspective.

The European Commission is also uniquely positioned to facilitate European-level coordination, encouraging collaboration across projects and promoting a shared strategic vision. A balanced approach combining minimum requirements for clustering with flexibility in implementation was identified as a promising way forward.

Current funding structures, while effective in supporting individual projects, often contribute to fragmentation by limiting continuity. There is a clear need for mechanisms that enable successful clusters to continue beyond project duration, such as umbrella actions or dedicated instruments supporting long-term collaboration.

5.2 BEPA

BEPA plays a key role in aligning research and innovation activities with European industrial and strategic priorities. From the cluster perspective, BEPA is seen as an important anchor for alignment and integration, particularly through its Strategic Research and Innovation Agenda (SRIA) and working groups.

The discussions highlighted the need to strengthen the connection between battery clusters and BEPA structures. While support in dissemination and communication activities is often the starting point for collaboration, there is significant potential to go further by integrating learnings and outcome of clusters more systematically.

Clusters can act as multipliers of impact, increasing visibility, facilitating uptake of results, and strengthening collaboration across projects. A more structured and continuous exchange between clusters and BEPA could further enhance this role.

5.3 LiPLANET

LiPLANET is well positioned to provide operational and structural support to battery clusters. Its cross-cutting role enables it to act as a bridge between projects, clusters, and funding cycles.

A key contribution identified during the workshop is its potential to support cluster-level coordination and management, including the organisation of joint activities and exchange formats. In addition, LiPLANET could play a central role in facilitating knowledge transfer between clusters, particularly through structured handover mechanisms when projects or clusters come to an end.

The discussions also highlighted the importance of developing shared infrastructures and tools, such as harmonised data approaches or central repositories, to preserve and exploit knowledge generated across clusters. Rather than building such infrastructure from scratch, clusters could draw on existing European data and computing research infrastructures, such as the EuroHPC supercomputer LUMI or other HPC and data service infrastructures, for the technical resources required, while LiPLANET contributes coordination, curation and continuity. In this way, LiPLANET can help reduce fragmentation and strengthen long-term impact.

5.4 Battery 2030+ / BATT-BRIDGE

Battery 2030+ / BATT-BRIDGE provides a long-term strategic framework for battery research and innovation in Europe, including road mapping, standardisation, as well as coordination and training activities.

From the workshop discussions, Battery 2030+ / BATT-BRIDGE is seen as a key actor in ensuring strategic alignment and continuity across projects and clusters. However, challenges remain in linking long-term research agendas with the shorter timelines of individual projects, particularly in relation to Technology Readiness Level (TRL) progression.

There is a strong need to further integrate clusters into the Battery 2030+ / BATT-BRIDGE ecosystem, enabling better alignment of research activities, fostering community growth, and ensuring that knowledge generated within projects contributes to broader, long-term objectives.

06

Recommendations for strengthening impact and sustainability of battery clusters

Addressing the identified challenges requires a shift from project-based clustering towards a more systemic, ecosystem-oriented approach. The following recommendations aim to strengthen both the effectiveness and the long-term sustainability and impact of clustering activities:

1

RECOMMENDATION 1

Start clustering early and build on existing structures

Clustering activities should be initiated at an early stage of projects and, where possible, aligned with or integrated into existing clusters rather than creating new, parallel structures. This can be supported in two complementary ways: CINEA Project Officers (POs) can point newly funded projects to fitting existing clusters, and, conversely, cluster coordinators can be informed about newly funded projects in their thematic area so that they can approach them directly. The latter places the initiative with those who have the strongest interest and the relevant know-how, rather than adding to the demands on new projects during an already intensive Grant Agreement Preparation (GAP) phase. Establishing this as standard practice across the battery R&I ecosystem would significantly reduce fragmentation and accelerate community building.

CONCRETE MEASURES

1.1 During the GAP phase, **POs could flag relevant existing clusters** and point newly funded projects towards initiatives they could join. This practice already exists in individual cases – for instance within 2Zero partnership projects, where POs have actively suggested joining the E-VOLVE cluster – and could be established as standard practice across battery-related calls. This would be considerably facilitated by a central overview of active clusters (see Recommendation 3).

1.2 Once new grants are signed, **CINEA could share basic information on newly funded battery projects** (e.g. acronym, call topic, coordinator contact) with the coordinators of thematically relevant existing clusters, so that they can reach out proactively. While sister projects under the same call topic are usually known to an existing cluster, projects funded under later or adjacent calls often are not. A structured information flow would ensure that joining an existing cluster does not depend on who happens to know whom.

CONCRETE MEASURES (CONTINUED)

1.3 Within the mandatory Dissemination, Exploitation and Communication (DEC) plan, **projects could be requested to state which existing cluster(s) they intend to join**. This introduces no additional reporting burden, as the DEC plan is already a required deliverable, but makes the clustering decision explicit, documented and traceable from the outset.

1.4 Where no fitting cluster exists, creating a new one should not fall to individual projects by default. Setting up and coordinating a cluster requires time and resources that are rarely foreseen in project budgets, and not every consortium has the interest or capacity to take on this role, particularly in lower-TRL projects. In such cases, the need for a new cluster should be flagged to CINEA and the relevant coordination structures (e.g. BATT-BRIDGE or LiPLANET), so that coordination can be organised and resourced jointly (see Recommendation 2).

2

RECOMMENDATION 2

Ensure continuity beyond project duration

Continuity should be considered systematically rather than left to chance. At the end of a cluster's lifecycle – ideally in the context of the final project review or final report – an explicit assessment should be made as to whether, and in what form, the cluster should continue. Not every cluster needs to be sustained; the value lies in making this a deliberate decision rather than a default dissolution. Where continuation is warranted, integration into an existing structure should be the preferred route, rather than the creation of new, standalone mechanisms.

CONCRETE MEASURES

2.1 At the final project review, **a brief continuity assessment could be included**, identifying which structures justify continuation and recommending an appropriate route. As with the DEC plan, this introduces no additional reporting burden by building on an existing structure, while ensuring that the end of a cluster becomes a deliberate decision point rather than a default dissolution.

CONCRETE MEASURES (CONTINUED)

2.2 Where a cluster is to be continued, **integration into an existing structure should be prioritised** – for instance into BATT-BRIDGE, another fitting existing cluster, or a relevant BEPA working group – rather than establishing new, parallel coordination structures. Alternatively, an established cluster may itself be continued by integrating newly funded projects, whose resources can support its renewed activities and coordination.

This preserves accumulated networks and knowledge at comparatively low cost and anchors cluster outputs in structures with a longer-term perspective. Clusters combining more mature projects with newly funded ones have proven particularly effective, as experience and results can be passed on directly instead of being shelved when a project ends.

2.3 For well-established clusters with demonstrated value, **coordination should be resourced independently of any single project or organisation**. Options include a coordination task and budget earmarked in call topics and shared among sister projects, proportionate contributions from all member projects foreseen in their budgets from the outset, a coordination role assigned to a long-term structure such as BATT-BRIDGE or LiPLANET, or a dedicated Coordination and Support Action for the battery cluster community. Whichever route is chosen, the mechanism should be systematic and uniform across battery-related calls, so that continuity no longer depends on individual organisations happening to receive follow-up funding.

3

RECOMMENDATION 3

Strengthen inter-cluster cooperation

Clusters should not operate in isolation. Structured exchange between clusters should be encouraged to avoid duplication, share emerging practices, and leverage complementarities across different initiatives and thematic areas. This is particularly valuable where clusters address adjacent topics or face common challenges – such as sustainability/LCA, data management, or exploitation – that no single cluster needs to solve alone.

CONCRETE MEASURES (CONTINUED)

3.1 **A central, regularly updated overview of active battery clusters should be established**, listing for each cluster its thematic focus, member projects, current status and a contact person (cluster representative or coordinator). At present, identifying which clusters exist, whether they are still active and whom to contact is time-consuming and largely depends on personal networks, as experienced during the preparation of the Graz workshop. Such an overview would be a low-cost prerequisite for structured cross-cluster exchange and would equally help Project Officers point newly funded projects to suitable clusters (see Recommendation 1). It could be hosted and maintained by BATT-BRIDGE or LiPLANET, alongside the repository proposed under Recommendation 4, with cluster coordinators confirming or updating their entries once a year.

3.2 **A recurring cross-cluster exchange could be established**, organised around thematic priorities that build on the working groups already active within individual clusters. Rather than each cluster addressing recurring topics in parallel and in isolation, these shared themes could form the basis of joint sessions across clusters.

3.3 Such exchanges could be **aligned with existing events**, for instance the annual BATT-BRIDGE conference, or held online to keep participation low-threshold and continuous.

3.4 Effective coordination is a prerequisite. **Cluster leaders could take on the convening role on a rotating basis.** The structure that maintains the cluster overview would support them, and the coordination mechanisms in Recommendation 2 would provide the resources. This keeps the exchange going without depending on any single initiative.

4

RECOMMENDATION 4

Establish structured knowledge transfer mechanisms

Systematic approaches are needed to capture, preserve, and transfer knowledge between clusters and across funding cycles. Currently, knowledge exchange depends largely on individual actors rather than institutionalised processes, making it inconsistent and vulnerable to loss when projects end. Establishing lightweight, standardised mechanisms would ensure that the experience and results generated within clusters remain available to subsequent projects and initiatives.

CONCRETE MEASURES

4.1 Each cluster could produce **a short, standardised cluster exit report** towards the end of its lifecycle, capturing key outputs, contacts, lessons learned, and unresolved questions in a consistent format. Linked to the continuity assessment proposed above, this would ensure that essential knowledge is documented at the point it is most at risk of being lost and passed on in a form that a successor cluster or project can readily use. A shared template would keep the effort minimal and the output comparable across clusters.

4.2 **A central, maintained repository** could serve as the shared home for these exit reports and other cluster outputs, ensuring they remain accessible across funding cycles rather than disappearing with individual project websites. Given its cross-ecosystem coordination role, BATT-BRIDGE or alternatively LiPLANET would be well placed to host and maintain such a repository, providing the institutional continuity that individual clusters cannot. Rather than developing a new technical platform, such a repository could build on existing European research data and computing infrastructures.

07

Outlook and next steps

This White Paper is intended as a starting point, not an endpoint. Its publication should be accompanied by concrete follow-up action to translate recommendations into practice. The following steps are proposed:

A **Identify institutional focal points.** Within each of the four key institutional actors, a named contact point or responsible function should be assigned to engage with the recommendations of this paper. For the European Commission/CINEA, this could involve the relevant Project, Policy or Programme Officers or DG RTD unit leads overseeing battery-related calls. For BEPA, the appropriate working group chairs or secretariat functions. For LiPLANET, this could involve the coordination team or an equivalent function responsible for cross-cluster activities. For Battery 2030+/BATT-BRIDGE, the leads of the strategic road mapping process. Without designated ownership, systemic recommendations risk remaining aspirational.

B **Establish a follow-up mechanism.** A small cross-institutional working group or task force, drawing on participants from the Graz workshop, should be established to oversee implementation. This group should meet at defined intervals – an initial check-in within three months of publication is recommended – and report on progress against the recommendations.

C **Phase the recommendations.** Not all recommendations require the same timeframe or actors. Short-term actions – such as setting up a central overview of active clusters, establishing knowledge handover protocols and aligning active clusters with BEPA working groups – can be pursued within existing project structures. Medium-term actions, such as integrating minimum clustering requirements into upcoming calls, depend on the Commission's programme design cycle. Long-term structural changes, such as dedicated continuity instruments, a uniform funding mechanism for cluster coordination, or cross-cycle cluster repositories, require more sustained institutional commitment.

D **Define indicators of progress.** Concrete indicators should be agreed to track whether the recommendations are being implemented. These might include the share of active clusters with documented knowledge handover plans, the number of cross-cluster working groups active beyond project end, or the uptake of clustering requirements in new calls. Even indicative targets would give the follow-up process accountability and direction and allow monitoring of progress over time.

The Graz workshop demonstrated that the willingness to move beyond project-bound collaboration is real and shared across the ecosystem. This White Paper provides the analytical foundation and the direction forward.

Preliminary findings were presented as a poster at the Battery 2030+ conference on 7–8 May 2026 in Turin, Italy. The White Paper will be shared at the Battery Innovation Days 2026 on 11–12 November 2026 in Stockholm, Sweden, and at the GigaGreen final results workshop and EU policy dialogue on 24 November 2026 in Brussels, Belgium. A dedicated follow-up meeting will be organised soon after (early 2027).

08

Conclusions

The findings of this White Paper point to a clear need to move from predominantly project-bound clustering towards a more continuous and strategically connected approach. The key challenge is therefore not to create more cluster structures, but to make better use of those that already exist: by initiating clustering earlier, linking new projects to established communities, enabling successful clusters to continue where there is clear added value, and ensuring that knowledge and relationships are transferred rather than lost between funding cycles.

Achieving this does not necessarily require major new structures or substantial additional reporting. The one element that does require dedicated and predictable resources is the coordination of well-established clusters, which should be funded independently of individual projects and organisations. Many of the proposed measures can be embedded into existing processes, including Grant Agreement Preparation, DEC planning, final project reviews and established European coordination structures. Continuity can take different forms: integration into initiatives such as Battery 2030+ / BATT-BRIDGE or relevant BEPA working groups, transfer to another suitable cluster, or continuation of an established cluster through the integration of newly funded projects. The appropriate route should depend on the value, maturity and strategic relevance of the individual cluster.

Ultimately, more sustainable clustering will depend on shared responsibility across projects, cluster coordinators and European-level actors. The European Commission and CINEA, BEPA, LiPLANET and BATT-BRIDGE each have complementary roles in enabling continuity, strategic alignment, cross-cluster cooperation and knowledge preservation. Strengthening these connections would allow Europe to retain the networks, experience and collaborative capacity created through publicly funded projects and thereby increase the long-term value and impact of its investments in battery research and innovation.

1 **Start clustering early and build on existing structures**

2 **Ensure continuity beyond project duration**

3 **Strengthen inter-cluster cooperation**

4 **Establish structured knowledge transfer mechanisms**



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