Towards a competitive European industrial battery value chain for stationary applications and e-mobility

A European Partnership under Horizon Europe

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Ambition of the Partnership

The Batteries Partnership’s vision
To establish by 2030 in Europe the best in the world innovation ecosystem to boost a competitive, sustainable and circular European battery value chain and to drive the transformation towards a carbon-neutral society

- Only a partnership, i.e. a long-lasting and coordinated effort involving industry, research and the public sector, can live up to the challenge and bring predictability to the European battery value chain stakeholders.

By pooling Europe’s resources and knowledge, partnerships have demonstrated their efficiency for accelerating the development, industrialisation and deployment of strategic technologies that underpin growth and jobs in key sectors of the European economy.
Towards a competitive European industrial battery value chain for stationary applications and e-mobility

<table>
<thead>
<tr>
<th>General objectives</th>
<th>Specific objectives</th>
<th>Technical objectives (2030 targets vs 2019 values, in line with SET Plan)</th>
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</thead>
<tbody>
<tr>
<td>1. Contribute to make Europe the 1\textsuperscript{st} climate-neutral continent by 2050</td>
<td>1. Provide the European Industry with differentiating technologies, supporting the development of an innovative, competitive and sustainable battery manufacturing industry in Europe</td>
<td>1. Increase energy density +60%</td>
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<td>2. Enable the European leadership in the battery industry across the value chain, creating economic growth and jobs in a circular economy</td>
<td>2. Develop sustainable and affordable battery solutions for clean mobility</td>
<td>2. Increase power density and charging rate (charging time &lt; 20’)</td>
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<td>3. Contribute to achieve a zero-pollution ambition for a toxic-free environment</td>
<td>3. Enable a cost-effective integration of renewable energy sources in the power grid</td>
<td>3. Improve cycle lifetime &gt; 2x</td>
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<td>4. Reduce battery cost - 60%</td>
<td>5. Ensure battery safety\textsuperscript{(1)} automotive 4 / aviation and waterborne 2</td>
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<td>6. Implement BAT in manufacturing and recycling operations (plants 4.0 or 5.0)</td>
<td>7. Improve sustainability and circularity)</td>
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\textsuperscript{(1)} EUCAR cell safety level
A clear intervention logic, identifying the key challenges to be tackled by the detailed targets for each specific objective

**Specific Objectives**

- Provide the European Industry with differentiating technologies
- Battery solutions for clean mobility
- Cost-effective integration of renewable electricity

**Faced challenges**

<table>
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<tr>
<th>Competitiveness</th>
<th>Sustainability</th>
<th>Industrial Upscaling</th>
<th>Uptake (market, regulatory, policy)</th>
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<td>Raw material processing technologies</td>
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<td>Advanced materials</td>
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<td>Cell design</td>
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<td>Manufacturing processes</td>
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<td>Recycling technologies</td>
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<td>Application specific, smart and safe battery solutions for all transport modes (road, air, water, rail)</td>
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<td>Flexible, scalable, smart and affordable solutions for stationary applications</td>
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A Strategic Research & Innovation Agenda (SRIA) built on the key R&I areas

**Raw Materials**
- **AREA 1**: Raw Materials and Recycling
  - **SO1**: Provide the European Industry with differentiating technologies, supporting the development of an innovative, competitive and sustainable battery manufacturing industry in Europe
  - **TO4**: Reduce battery cost - 60%
  - **TO6**: Implement BAT in manufacturing and recycling operations (plants 4.0 or 5.0)

**Advanced Materials**
- **AREA 2**: Advanced Materials and Manufacturing
  - **SO1**: Provide the European Industry with differentiating technologies, supporting the development of an innovative, competitive and sustainable battery manufacturing industry in Europe
  - **TO1**: Increase energy density +60%
  - **TO2**: Increase power density and charging rate (charging time < 20')
  - **TO3**: Improve cycle lifetime > 2x
  - **TO4**: Reduce battery cost - 60%
  - **TO6**: Implement BAT in manufacturing and recycling operations (plants 4.0 or 5.0)

**Cells**
- **Application Integration**
- **End-of-life**

**Packs**
- **AREA 3**: Battery end-uses and operations
  - **SO2**: Develop sustainable and affordable battery solutions for clean mobility
  - **SO3**: Enable a cost-effective integration of renewable energy sources in the power grid
  - **TO1**: Increase energy density +60%
  - **TO2**: Increase power density and charging rate (charging time < 20')
  - **TO3**: Improve cycle lifetime > 2x

**Modules**

** AREA 4 - Safety**
- **TO5**: Ensure battery safety

** AREA 5 - Sustainability**
- **TO7**: Improve sustainability and circularity

14 October 2020
Scope of the Partnership

• While R&I has to be conducted on all parts of the value chain, advanced materials development and battery cell design & manufacturing are seen as the key activities for which a well-structured coordination will allow Europe to develop the most differentiating technologies.

• The Partnership should therefore allocate a substantial part of its resources on these segments of the value chain, along with circular economy aspects:
  - Active material and related components (battery-grade raw materials, cathodes, anodes, binders, electrolytes (particularly solid-state future electrolytes), the processes and equipment to manufacture them, and novel methods for accelerated discovery and engineering of materials and interfaces)
  - Other materials (separators, casing, mechanical components,...)
  - Cell assembly technologies: the transition to solid state creates the opportunity to invest in new technologies to compete worldwide, but it requires advanced technology for manufacturing: specialised equipment for new manufacturing technologies...
  - Re-use, recycling, secondary raw materials from recycling
  - Regarding applications, the Partnership will mainly focus on batteries for decarbonised transport and stationary energy storage.

• Appropriate balance between short-to-medium term and long-term R&I activities:
  - enhancement of close-to-market Li-ion technologies (TRL 5-8)
  - new promising and longer-term breakthrough technological solutions (TRL 2-4)
Interactions and synergistic effects with other Partnerships

Applications sectors with a dedicated Partnership

- 2Zero
- Clean Aviation
- Zero-emission waterborne transport
- Transforming Europe’s rail system

The dedicated partnership takes the lead on the downstream R&I segment activities specific to this sector

2Zero Partnership as an example

- 2Zero will be responsible for R&I activities dealing with the integration in the vehicle, charging infrastructures, etc.
- Topics related to battery modules, battery packs and battery management system will be addressed as interface in both partnerships. The responsibility will be allocated to main research focus (i.e. either upstream (material, cell or battery manufacturing innovations) or downstream (vehicle integration,...)
The Partnership on Batteries in the European R&I landscape

**PARTNERSHIP ON BATTERIES**

- **Feedback for SRIA / roadmaps update**
- **Coordination / Collaborations** (facilitated by ETIP Batteries Europe)
- **Inputs to define R&I calls (SRIA / Technology Roadmaps … )**
  - Identify the high priority topics to be implemented in its R&I work programmes
  - Support and oversee the portfolio of funded projects
  - Reinforce networks between industry, RTOs, universities and other organisations
  - Attract engagement of more stakeholders in collaborative R&I activities and demo-projects
  - Encourage a robust lab-to-market process and innovation and technology transfer

**Other Partnerships**
- Battery downstream & complementary WP under Horizon Europe

**Other R&I activities**
- (under Horizon Europe, IPCEIs, S3 interregional Partnership, national and bilateral instruments,...)

**Horizon Europe Pillar 3 and other market uptake instruments**

**INNOVATION FUND**

**Skills development**

**Other strategic bodies…**

**Innovation and technology Transfer**

**14 October 2020 BATTERY 2030PLUS KICK-OFF**
Next steps - Q4 2020 - Q1 2021

• Setting up the Partnership association (AISBL)
• Finalisation with the EC of the Strategic Research and Innovation Agenda (SRIA), on the basis of the 1st draft elaborated in an consultation process open to all the battery stakeholders
• Negotiation with the EC of the commitments from the partners
• Signature of the contractual arrangement
• Finalisation of WP2021-2022 and opening of first calls

Join the Partnership association to actively contribute!

✓ updating the SRIA, which defines the main R&I priorities for the next years
✓ providing concrete inputs to the Horizon Europe Work Programmes
✓ networking with the most excelling entities of the European battery sector
✓ participating in the association’s governance
✓ ...

Express your interest HERE
Thank you!

The Batteries Partnership Core team

with the support of