BEPA Batteries European Partnership Association

BEPA Matchmaking Event

HORIZON EUROPE 2025 CALLS

February 26th, online

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Sabancı Üniversitesi

HORIZON-CL5-2025-04-D2-04:

Integrating advanced material, cell design and manufacturing development for high-performance batteries aimed at mobility

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Sabancı University

1996	1999-2000	1.317.581 m²	187.445 m²
Established	First academic year	Campus size	Covered area

Non-profit Foundation University

A Top-Ranked Research University

All Programs in English

Scholarships for all graduate students

2500+ undergraduate students,
600+ graduate students,
6500+ undergraduate alumni, 2000+ grad alumni

Faculty of Engineering & Natural Sciences
110 faculty members, 10 full time instructors,
3 researchers, 27 post-docs

4 Research Centers & 120 Laboratories

- ❑ *Center of Excellence on Nano Diagnostics (EFSUN)*
- ❑ *Center of Excellence in Data Analytics (VERİM)*
- ❑ *Integrated Manufacturing Research and Application Center (SU-IMC)*
- ❑ *Nanotechnology Research and Application Center (SUNUM)*

https://www.sabanciuniv.edu/en

Continuous Process for Solid State Battery Production

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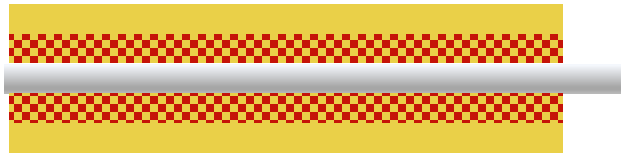
Cathode active material

Hybrid solid electrolyte

Graphite/Si - anode active material

Continuous Coating Process

Continuous Coating Process



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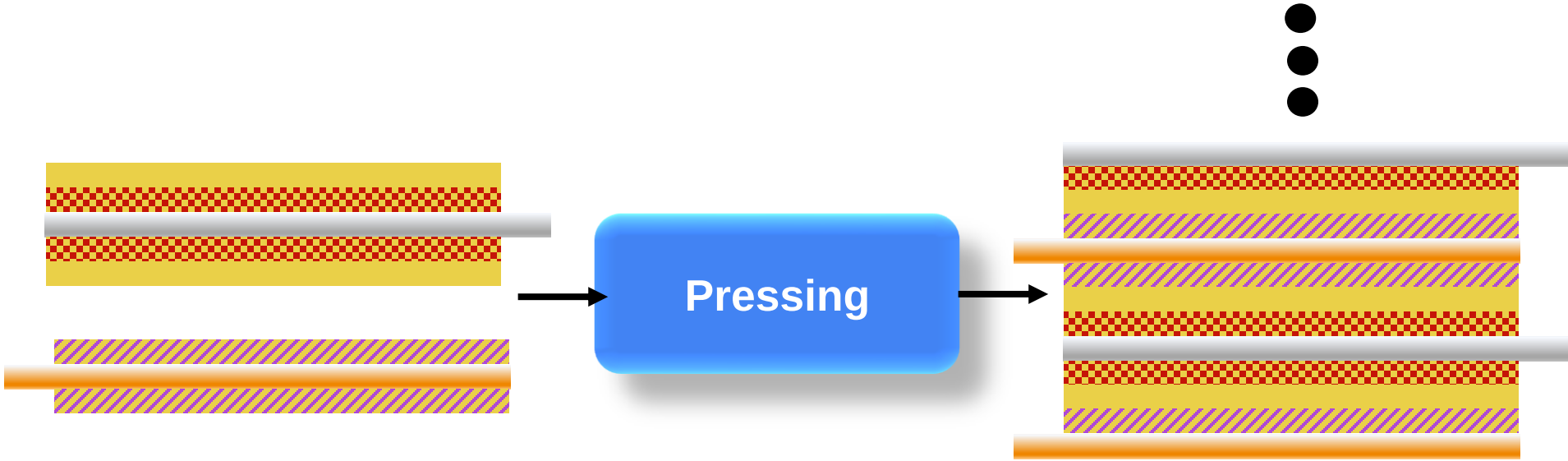
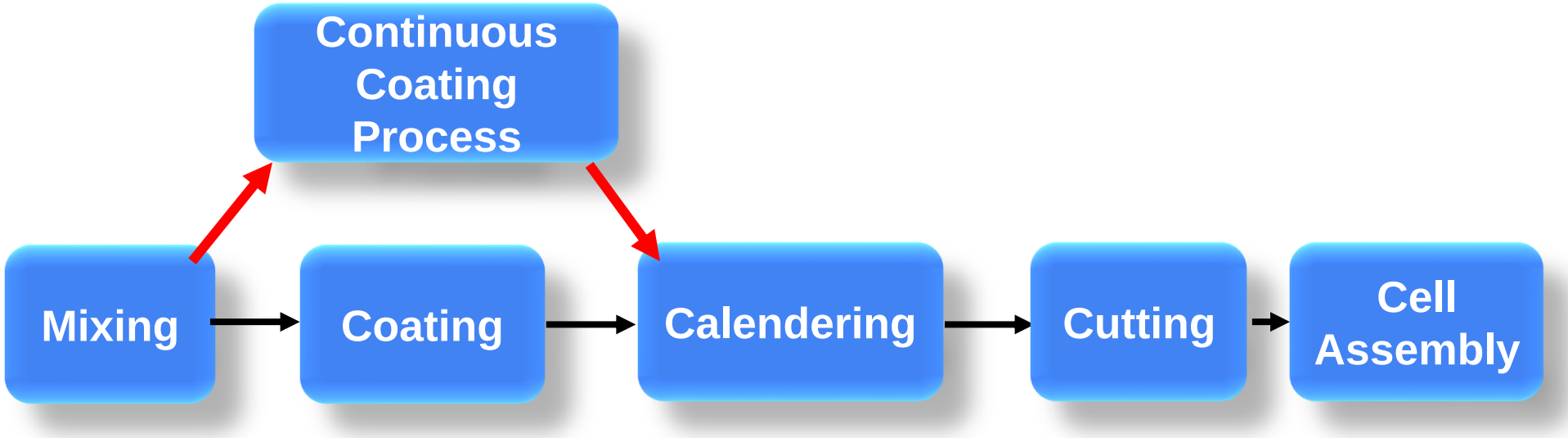
Continuous Process for Solid State Battery Production



Pressed and stacked sheet ready to be introduced to the battery manufacturing process

Continuous Process for Solid State Battery Production



Work Packages

WP1: Anode/Anolyte Preparation and Characterization

*Development of Si-C composite.

*Optimization of anolyte formulations for compatibility with solid-state electrolytes.

*Structural, electrochemical, and mechanical characterization.

WP2: Cathode/Catholyte Preparation and Characterization

*Synthesis and optimization of cathode materials (NMC).

*Development of compatible catholyte materials to enhance ion transport.

*Material characterization and performance validation.

Work Packages

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WP3: Electrolyte Preparation and Characterization

*Development of solid and hybrid electrolytes with tailored conductivity and mechanical stability.

*Compatibility studies with electrodes and scalable processing methods.

*Thermal, electrochemical, and structural analysis.

WP4: Hybrid Composite Manufacturing (Continuous Process Development)

*Optimization of the continuous process to produce cathode/catholyte-electrolyte-anode/anolyte layers in a single step.

*Process adaptation for existing battery production lines.

*Characterization of the composite sheets for mechanical integrity, uniformity, and electrochemical performance.

Work Packages

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WP5: Cell Assembly and Testing

*Fabrication of prototype cells using the new hybrid composite sheets.

*Electrochemical performance testing, including cycle life, rate capability, and stability.

*Safety and scalability validation at TRL 5 level.

WP6: Process Modeling and Digitalization

*Development of process models for continuous process-based composite sheet fabrication.

*Implementation of digital twin technology for process optimization.

*AI-driven data analysis to enhance manufacturing efficiency.

Work Packages

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WP7: Life Cycle Analysis (LCA) and Sustainability Assessment

*Evaluation of energy consumption, waste reduction, and resource efficiency of the new process.

*Comparative analysis of environmental impact vs. conventional SSB manufacturing.

*Recycling strategies for end-of-life materials.

WP8: Manufacturing Adaptation and Integration

*Engineering modifications required for integrating the new process into existing battery productio lines.

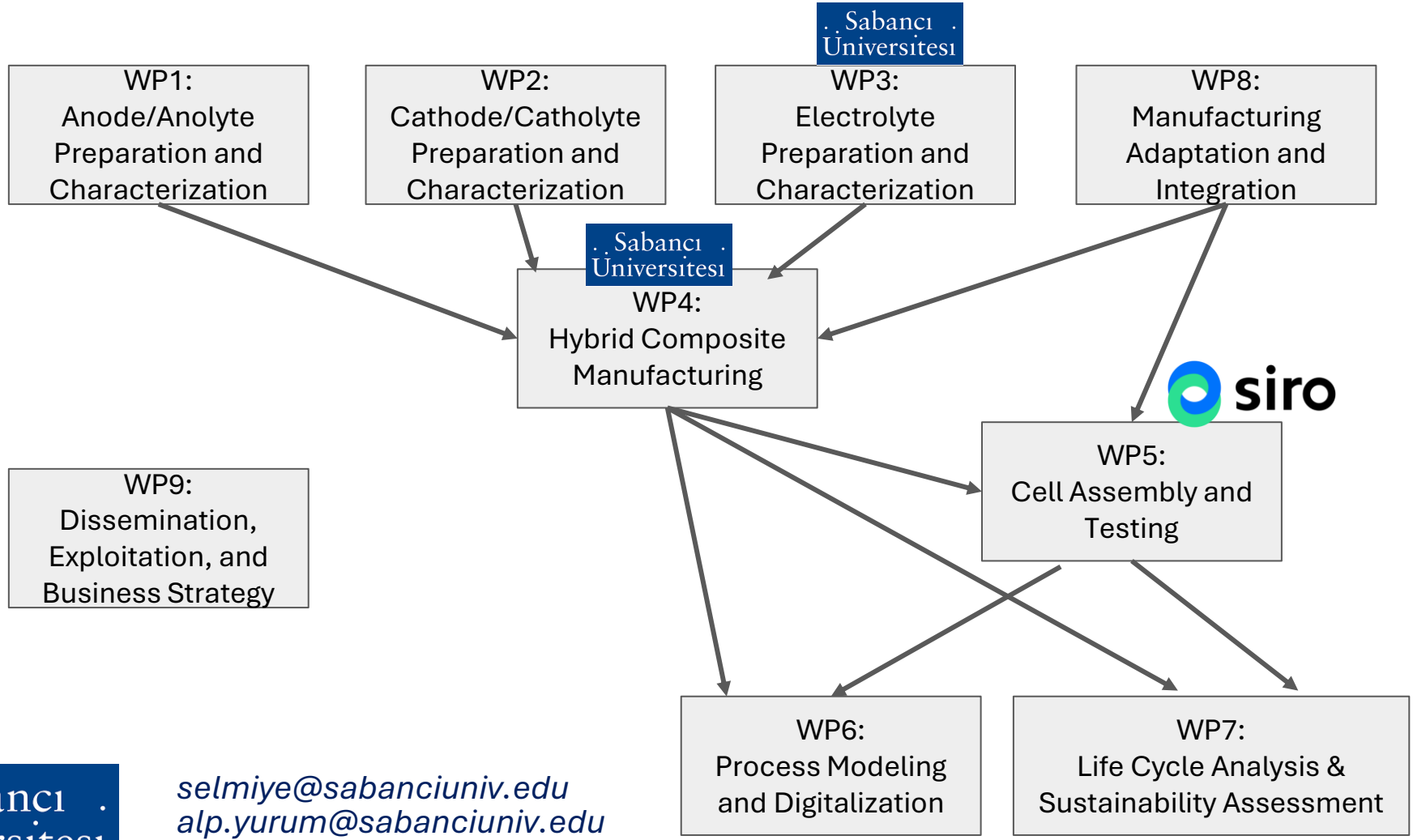
*Pilot-scale demonstration of process feasibility.

WP9: Dissemination, Exploitation, and Business Strategy

*Developing a business case for commercialization.

*Engaging industry stakeholders and potential adopters.

*Intellectual property and market analysis for technology deployment.



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