



Boosting Europe's sustainable battery cell industrial manufacturing value chain by developing an optimised machinery with intelligent control processes to minimise costs, scrap and energy consumption.



Funded by
the European Union



BATMACHINE in a nutshell

Programme: Horizon Europe Framework Programme 2021 - 2022

Call: Towards creating an integrated manufacturing value chain in Europe: from machinery development to plant and site integrated design ([HORIZON-CL5-2022-D2-01-04](#))

Type of Action: Innovation Actions

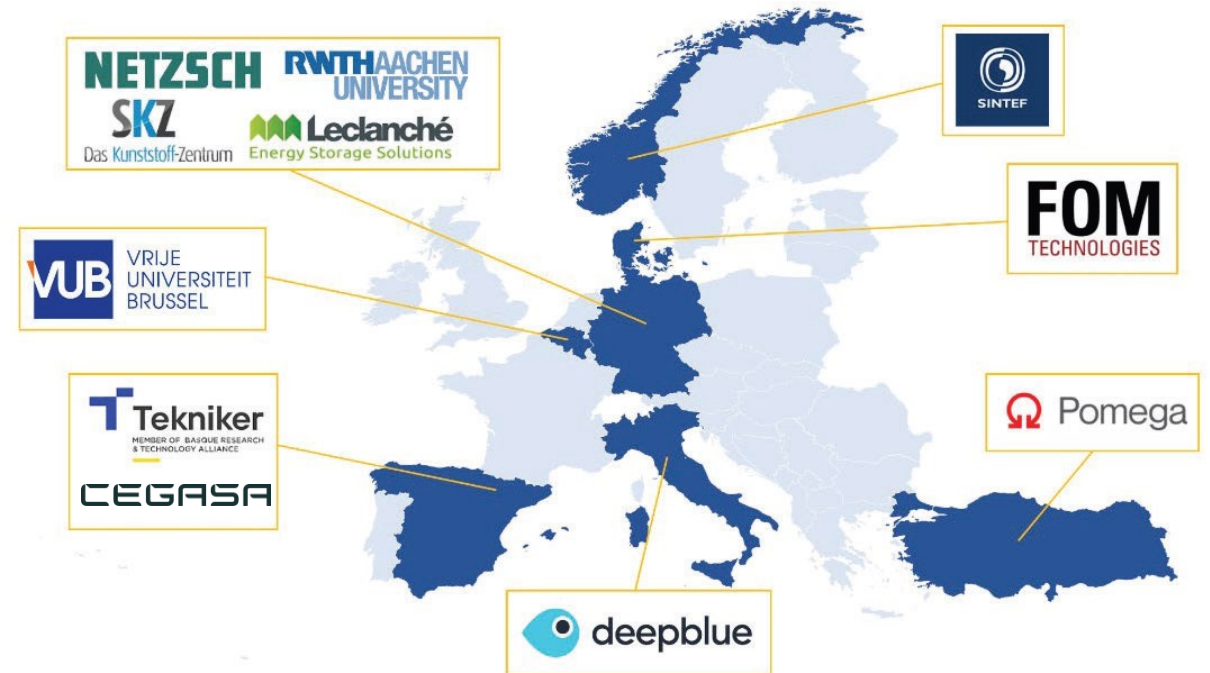
Project Name (ID): Boosting Europe's sustainable battery cell industrial manufacturing value chain by developing an optimised machinery with intelligent control processes to minimise costs, scrap and energy consumption (101104246)

Budget: 5 645 321.50 €

Duration: 1 June 2023 – 30 November 2026 (42 months)

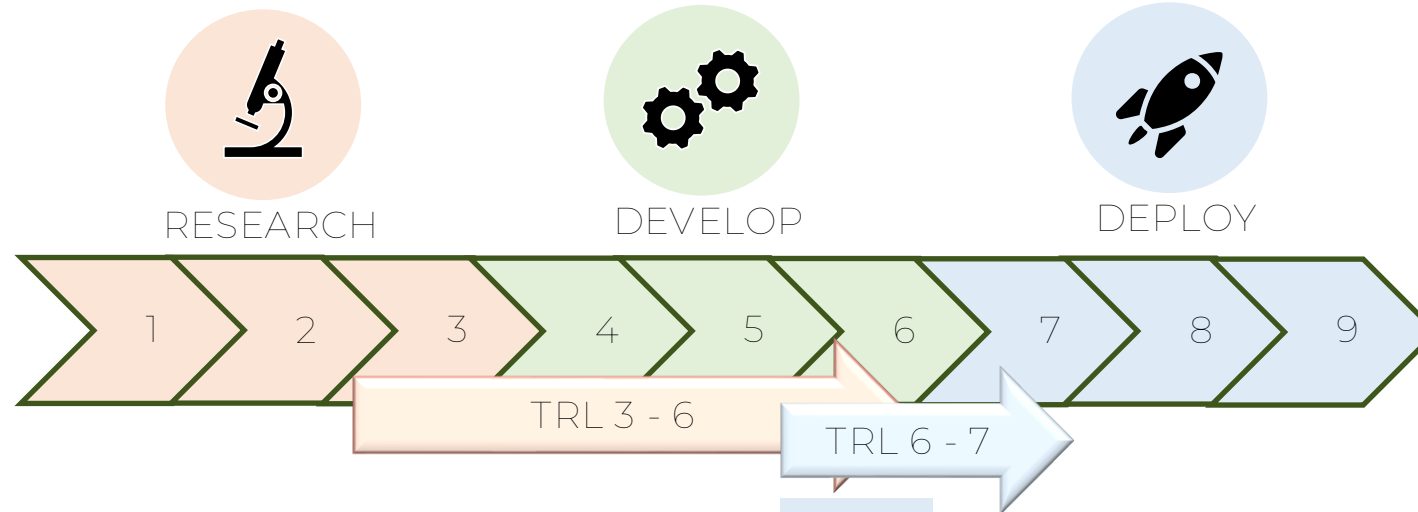
Consortium: 11 beneficiaries + 1 affiliated entity from 7 countries

Project Coordinator: Vrije Universiteit Brussel (VUB)





BATMACHINE OBJECTIVES



OBJ.1

Develop new battery cell manufacturing machinery, with priority on minimising energy needed for cells production, enhancement of plant efficiency rates

OBJ.2

Implement intelligent control processes and Industry 4.0 to enable the site integration and optimisation

OBJ.5

Develop a horizontal integration procedure of the European supply chain for battery process equipment into the growing production of giga-scale battery cells

OBJ.3

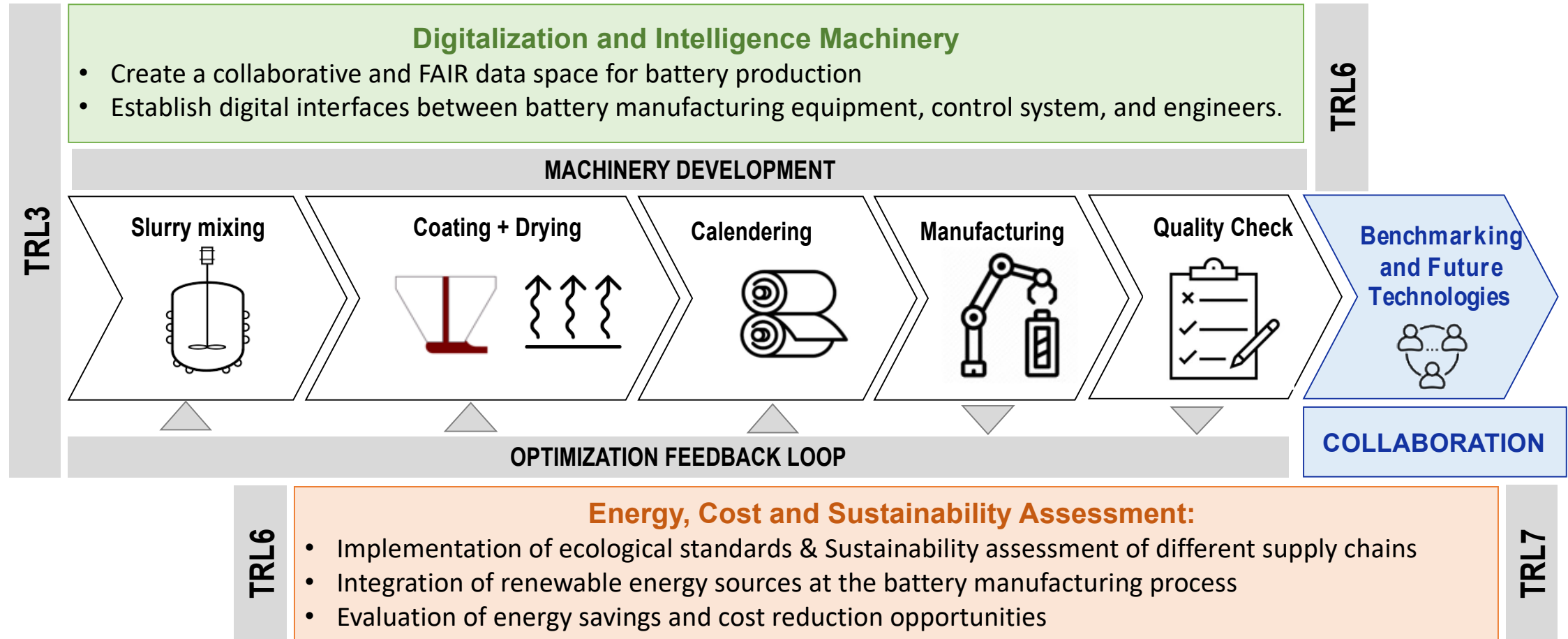
Cost and energy optimisation of the battery manufacturing process including the integration of low-carbon and low-emission energy sources

OBJ.4

Implement ecological standards in the design phase and investigate the environmental and social impacts of different machinery and supply chains to come to best practice proposals

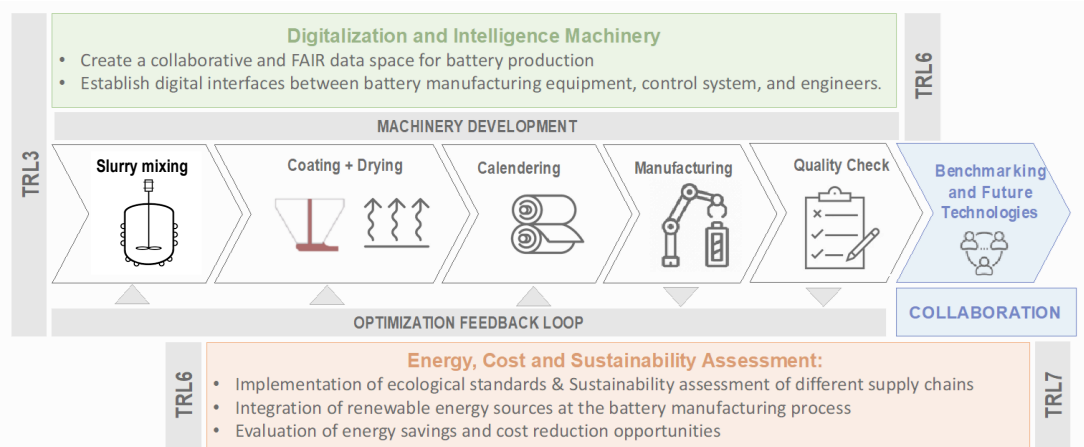


BATMACHINE phases and TRL level goals





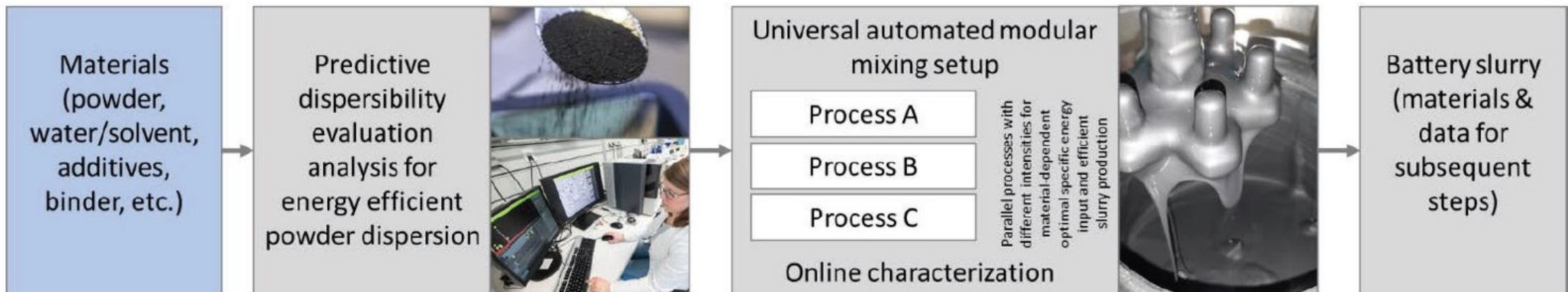
BATMACHINE phases and outcomes



Evaluation of scientific methods to predict the dispersibility of the components in battery slurries

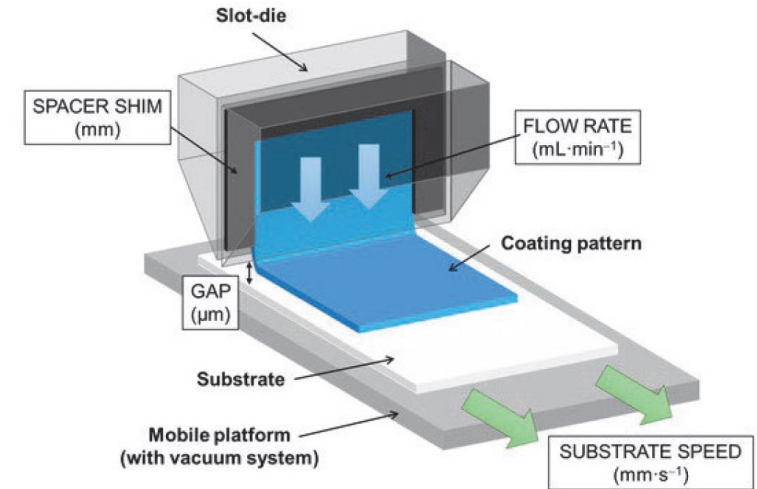
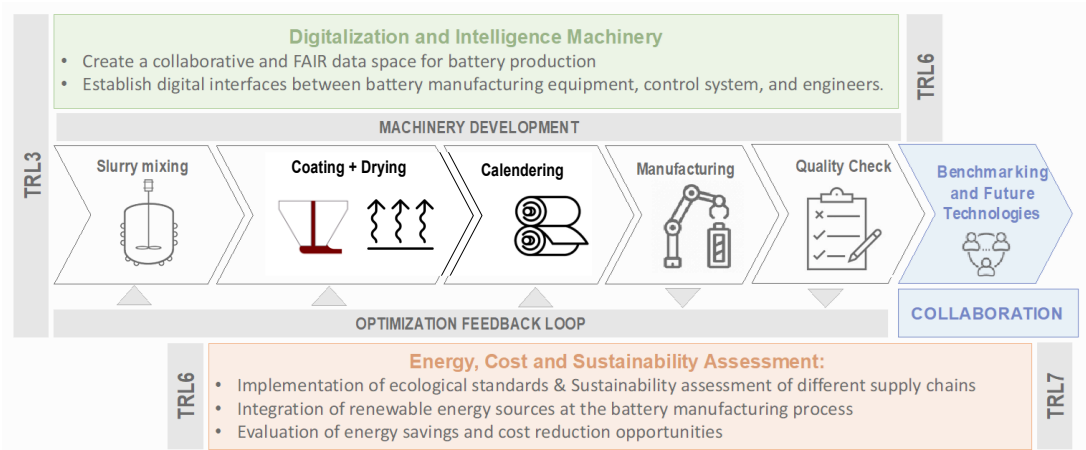


Development of a universal automated modular battery slurry mixing equipment for energy-efficient processing





BATMACHINE phases and outcomes



Angulo-Ibáñez, Adrián, et al. "Slot-Die Process of a Sol–Gel Photocatalytic Porous Coating for Large-Area Fabrication of Functional Architectural Glass." *Catalysts* 11.6 (2021): 711.



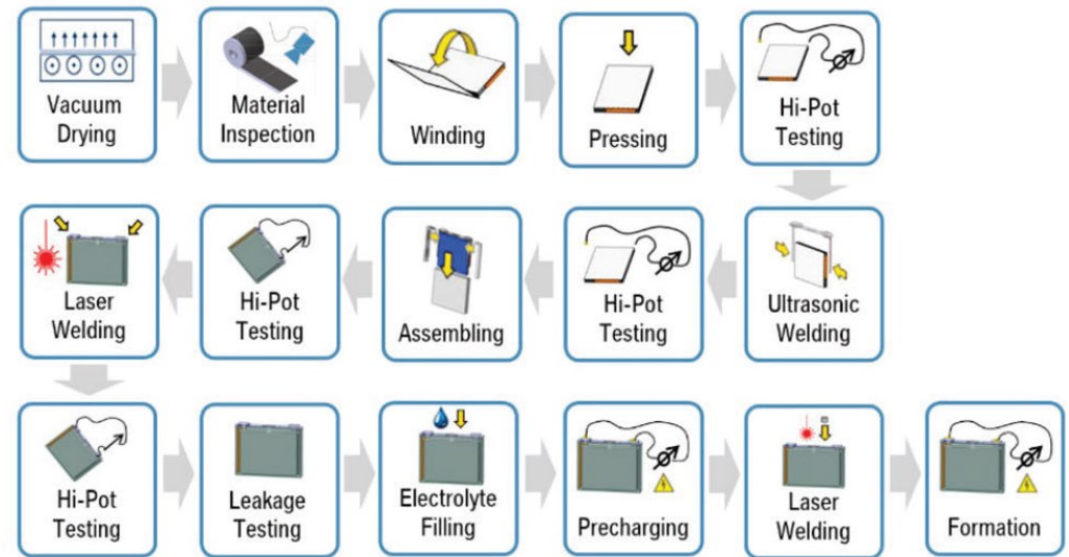
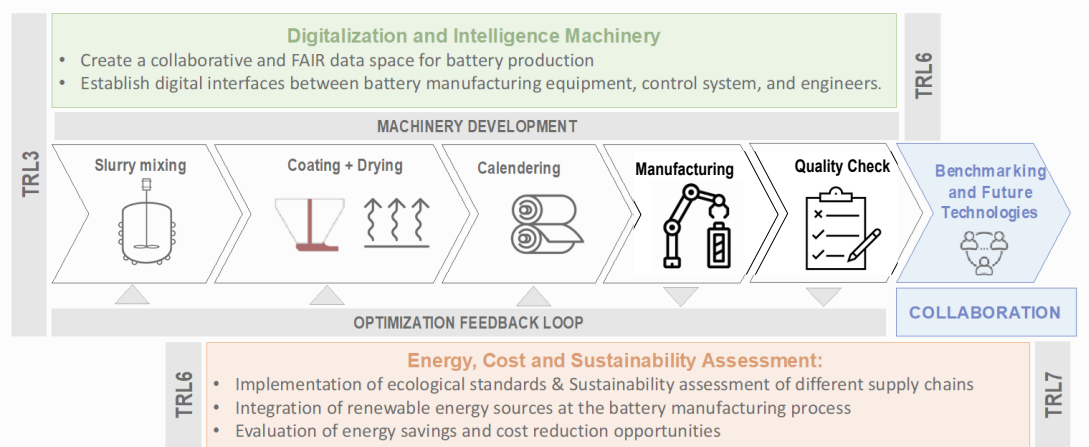
Development of a new modular roll-to-roll battery slot-die coater sourced and assembled in Europe.



Modular design of coater and calendaring machine being designed to minimize energy consumption through integration of intelligent control processes.



BATMACHINE phases and outcomes



Kornas, Thomas, et al. "Multi-criteria optimization in the production of lithium-ion batteries." *Procedia Manufacturing* 43 (2020): 720-727.



Integrate new machinery into production processes and optimize them based on feedback

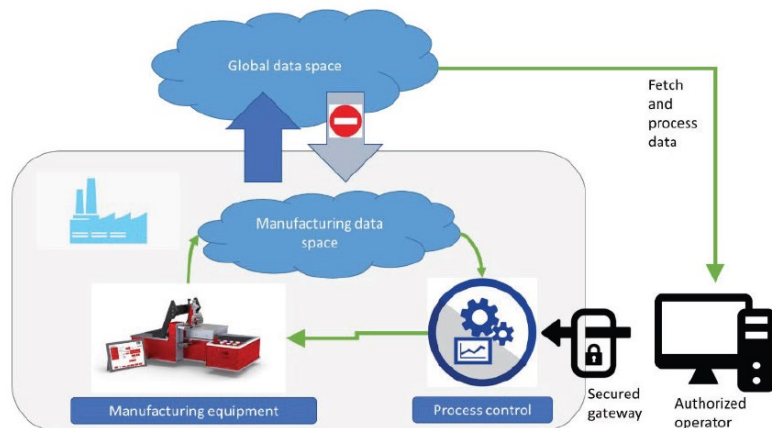
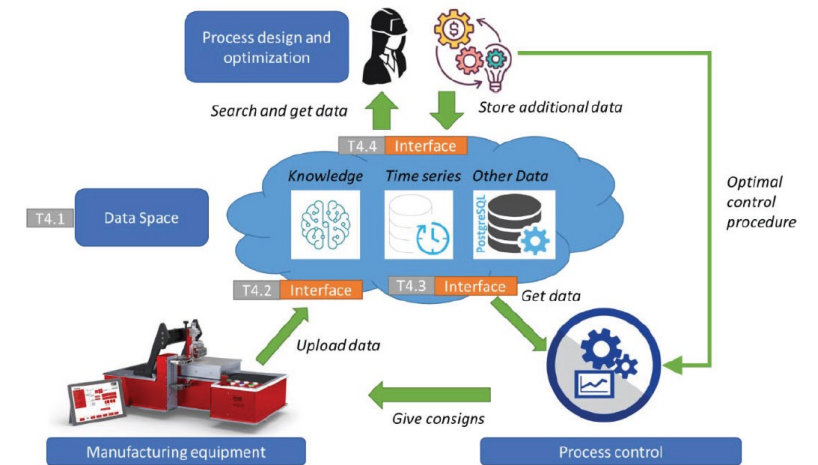
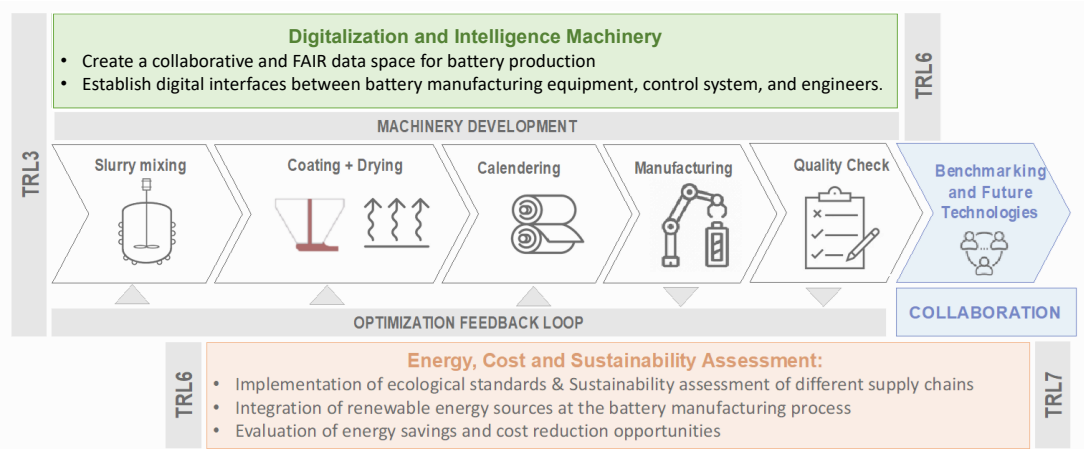


Feasibility assessment and scale-up scenarios using data from the pilot line to a Gigafactory





BATMACHINE phases and outcomes



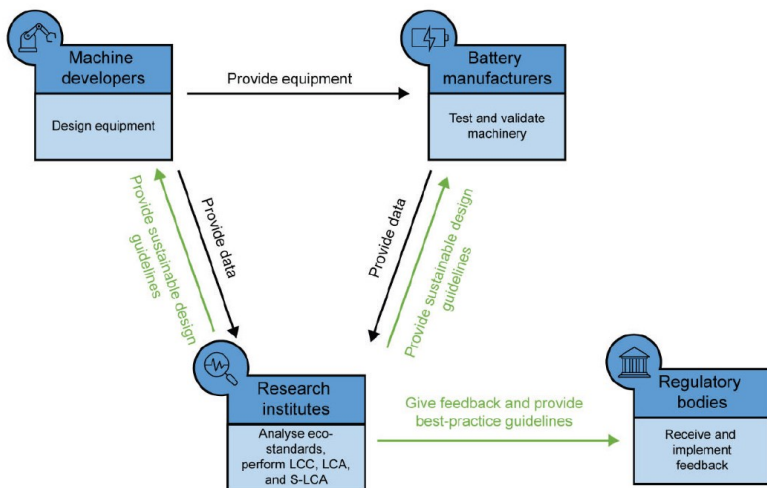
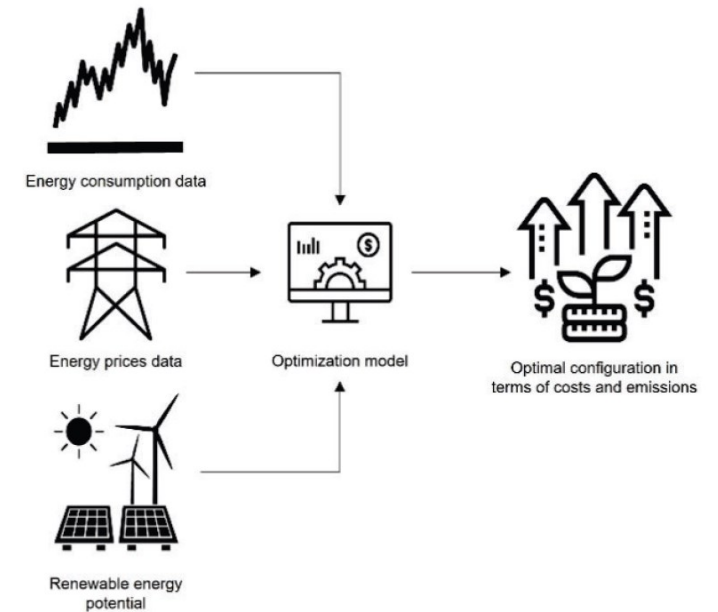
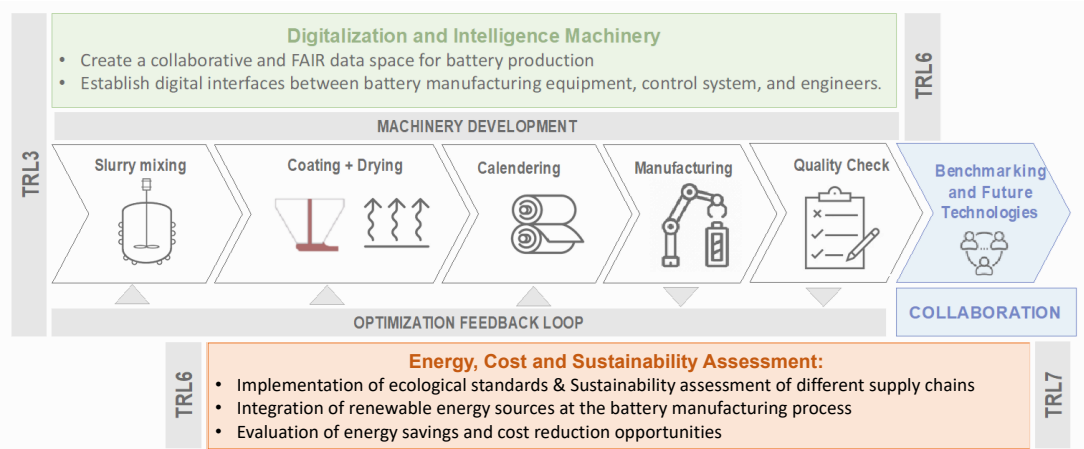
Implementation of Industry 4.0 tool to enable intelligent quality and process control of battery manufacturing



Data space to put the basis of a digital passport for each battery cell leaving the production line and track until recycling



BATMACHINE phases and outcomes



Holistic sustainability assessment including techno-economic, environmental and social indicators



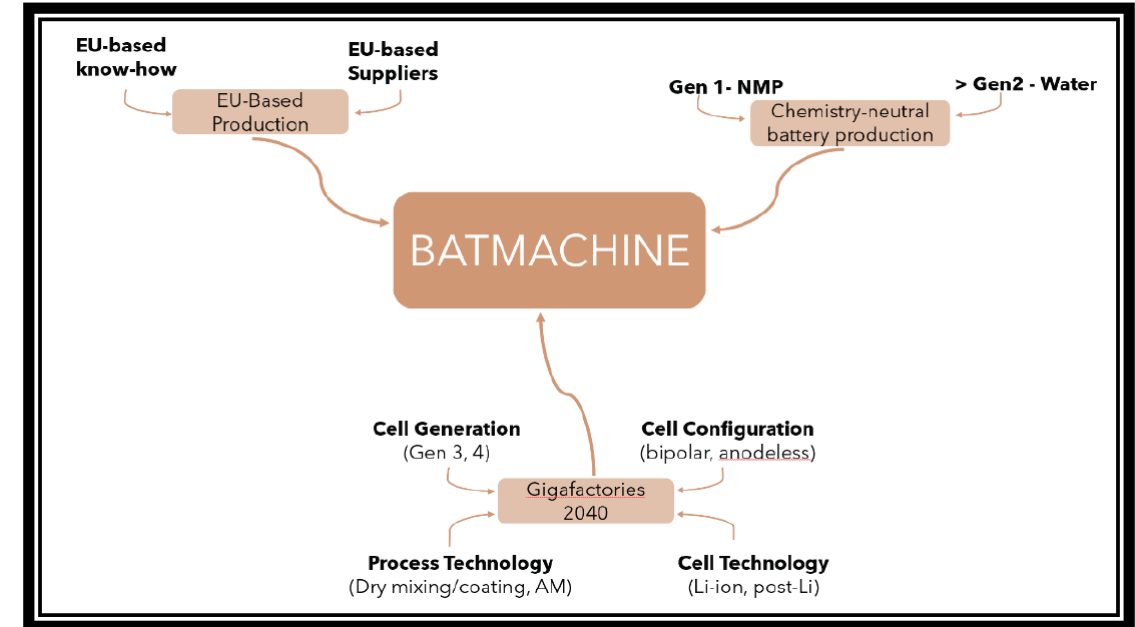
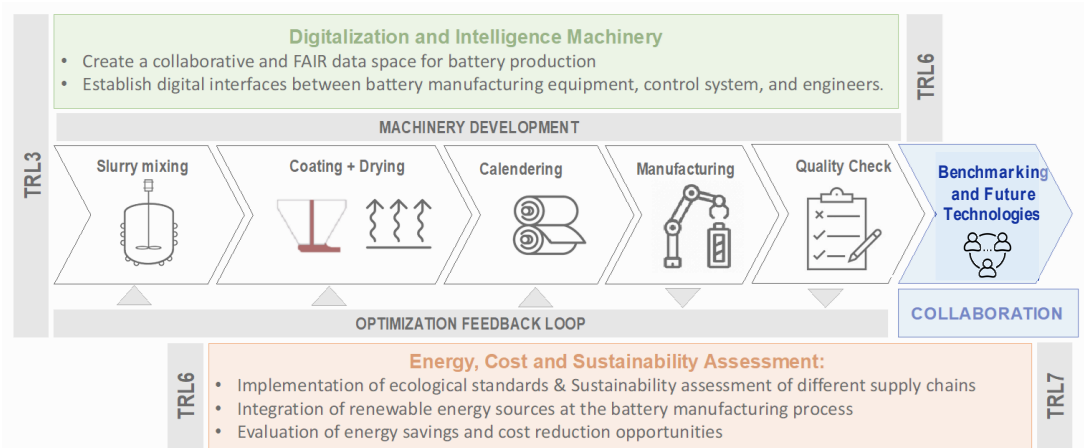
Prospective LCA methodologies for the future European gigafactories



Energy consumption data combined with a multi-objective optimization model taking into account location-specific weather and climate conditions



BATMACHINE phases and outcomes



BATMACHINE addresses horizontal integration of EU Battery Value Chain via EU-Based and chemistry-neutral battery production and provides more insights in line with 2040 perspectives of gigafactories



Various technologies are being intensively evaluated and assessed with regards to their future industrial use.



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