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TwinVECTOR

Twinning for Development of World-Class Next Generation Batteries

Project Number: 101078935

PLAN FOR WIDENING INTERACTIONS WITH EU PROJECTS AND NETWORKS

Activity: WP7 – Dissemination, exploitation, and communication

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2	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	AIT	Austria
3	BAYERISCHE FORSCHUNGSALLIANZ BAVARIAN RESEARCH ALLIANCE GMBH	BayFOR	Germany
4	KARLSRUHER INSTITUT FUER TECHNOLOGIE	KIT	Germany
5	TEKNOLOGIAN TUTKIMUSKESKUS VTT OY	VTT	Finland

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Acronyms and Definitions

Acronym	Definition
BayFOR	Bavarian Research Alliance
DEC	Dissemination, Communication and Exploitation
DoA	Description of Action
HTA	High-Tech Agenda
JP ES	EERA Joint Programme on Energy Storage
KoWI	Kooperationsstelle EU der Wissenschaftsorganisationen
RAU	Research administration unit at TBU
WP	Work Package



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Executive Summary

The deliverable PLAN FOR WIDENING INTERACTIONS WITH EU PROJECTS AND NETWORKS aims firstly at establishing collaborations with EU-funded projects that are currently underway through cross-clustering and participating in joint workshops organized by BayFOR, aimed at advancing battery-related research across all EU-funded projects.

Secondly, the deliverable provides plan for pursuing ongoing or new partnerships with international networks involved in battery research, as well as research administrations at other universities, to foster cooperation and knowledge sharing.



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1 Introduction

1.1 The Project TwinVECTOR

The TwinVECTOR project aims to create a centre of excellence at the Tomas Bata University in Zlín (TBU), focusing on next generation battery sustainable design, energy business models, and sustainability assessments, with the support of upgraded research and administration unit (RAU). The RAU therefore coordinates the capacity building measures of the partners' activities to emphasize the synergy and the creation of the centre of excellence at TBU. Hence, TBU will team up with excellent foreign institutions: VTT, AIT, KIT, and BAYFOR. The whole spectrum of activities is planned to activate knowledge at TBU, set-up knowledge pool and capacity building activities enabling flexible, multidisciplinary project teams to address the topic of the next generation of batteries with the help of life cycle thinking via sustainability assessments.

Additionally, advanced battery technologies also need to be assessed via a combination of techno-economic simulation tools, cost-benefit analysis, and business model innovation. The widening country of Czechia, specifically the Zlín region, aims to increase scientific expertise and capacity in these areas and methods. The consortium members will share the expertise so that TBU can boost the research capacity to undertake world-class research and development activities in the energy storage field and bring them to the market. The ability to produce original ideas will be reflected in multiple outcomes expected in the short-term horizon: EU projects submitted in cooperation with excellent partners, scientific papers, conferences, and business agreements. High-impact research is expected long-term with technology transfer into practice. The existing research capacity of all members will be strengthened via additional capacity-building activities in partnership with BAYFOR.



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1.2 Purpose and Scope of the Deliverable

The Deliverable 7.3 “Plan for widening interactions with EU projects and networks” refers to the task 7.2 “Widening interactions with EU-projects/networks”. BayFOR leads the D7.3 and takes responsibility for the tasks during the entire project duration. All consortium partners contribute to D7.3 with suggestions and support to fulfil following aims:

- Cross-clustering with ongoing EU-funded projects and common workshops (organised by BayFOR for all EU-funded projects related to battery topics);
- Initiating cooperation by engagement in international networks related to the battery research and with international networks of research administrations (including with other universities).

The purpose of the Twinning instrument is to improve networking efforts between research institutions in Widening countries and other beneficiary partners in the consortium. This involves providing assistance in the development and enhancement of networking capabilities, as well as facilitating the exchange of knowledge and best practices among research institutions and partners to promote excellence. While Twinning actions empower the research profile of Widening partner institution, they also boost the research capabilities and its staff including special focus on strengthening the research management and administrative skills of the coordination institution of the Widening country.

1.3 Process of Development

The overall aim of the Twinning instrument in Horizon Europe is to facilitate and improve access to excellence for research institutes of the Widening partner, namely TBU, and among the other consortium partners, namely VTT, AIT and KIT through knowledge transfer and exchange of best practice. Additional aim of the project is to start and enhance networking activities between Widening partner and other countries by building on the experience and potential of networking for excellence.

There are three types of beneficiaries within the consortium: While TBU as the coordinator of TwinVECTOR is the partner from the Widening country; VTT, AIT and KIT are the research partners and finally BayFOR is the “Enabler” for the coordinating part. Both latter roles mentioned will perform knowledge transfer and exchange of best practice between the beneficiaries and especially to the Widening partner.

BayFOR as the “Enabler” in the consortium supports the coordinating university (TBU) in building up the capacity and their networks. Indicated in the DoA of the project, BayFOR is responsible for



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the task 7.2 for the cross-clustering with ongoing EU-funded projects and common workshops (organized by BAYFOR for all EU-funded projects related to battery topics); and initiating thus cooperation by engagement in international networks related to the battery research and with international networks of research administrations.

To achieve these goals, WP7 will first identify and analyze EU projects that are relevant to TwinVECTOR's objectives and scope. This will involve conducting a comprehensive review of project documentation, including reports, publications, and other outputs. The WP will then prioritize projects based on their relevance and potential for collaboration.

The next step will be to establishing contact with the selected projects and initiate discussions on potential areas of collaboration. The WP will also explore opportunities for joint dissemination and outreach activities, such as joint workshops, conferences, or publications.

Finally, WP7 will document the results of these collaborations and disseminate them to the wider community. This may include publishing joint research papers, reports, or other outputs that showcase the benefits of cross-project collaboration. Through these efforts, the WP aims to foster a culture of cooperation and knowledge sharing within the EU community, ultimately leading to more efficient and effective project outcomes.



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2 Widening interactions strategy and objectives

In the context of this deliverable, the aims of the Twinning project TwinVECTOR in terms of widening interactions will be achieved by:

- stimulating and strengthen the “scientific strategy” of the Research administration Unit (RAU) of the coordinator for research and innovation capacity in the defined research area of battery and raising up scientific quality of the staff partners involved in the workshops/webinars.
- Supporting the scientific strategy including preparation for participation of new/ongoing research project(s) with the beneficiaries and also of other international partners in the prior defined scientific area of battery and related fields by setting up cross-clustering activities.

This "strategy" should include activities such as a series of workshops or webinars (including virtual training), additional short-term staff exchanges and at least one short-term on-site activity:

- Roadshow for a delegation of coordinator staff to hot-spots, i.e. other research experts and institutes.
- Active and passive participation in conferences, events or exhibitions as dissemination and outreach activities (e.g. presentations about the TwinVECTOR project or its presentation at a stand or with a poster).
- Such activities at events support the establishment of contacts and the initiation of international networks for future collaborations. More details are provided in deliverable 7.2 DEC-plan (Dissemination, Communication and Exploitation plan).
- The organisation of joint summer school does not fall within the scope of D7.3, as it relates to Task 7.2 and is highlighted by the research partner AIT in WP5 of D5.3.

These interactions are fulfilled across several objectives, which are shown in the detailed structure in Table 1.



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Excellence	
Objective 1	Initiating excellent capacity and resources for international cooperation
Objective 2	Strengthening the engagement of TwinVECTOR partners by integrating research component
Networking	
Objective 3	Enhancing knowledge transfer towards TBU
Objective 4	Enhancing of best practice sharing towards TBU
Reputation	
Objective 5	Establishing cooperation with industry players integrating regional battery ecosystem into national and international networks
Objective 6	Increasing high-impact research of TBU
Research management and administration	
Objective 7	Formulating TBU battery research management and administration strategy
Objective 8	Amplifying the research management capacity and administration skills of TBU
Creativity	
Objective 9	Stimulating research cooperation among partners
Objective 10	Mobilising and engaging TBU students in battery research
Objective 11	Boosting creativity by integrating new transdisciplinary approaches in battery science

Table 1 TwinVECTOR objectives

BayFOR will perform the widening interactions by the indicated project objectives in the following areas:

1. **Excellence:** Initiating excellent capacity and resources for international cooperation
2. **Networking:** Enhancing knowledge transfer
3. **Reputation:** Establishing cooperation with industry players integrating regional battery ecosystem into national and international networks
4. **Research Management and Administration:** Amplifying the research management capacity and administration skills of TBU
5. **Creativity:** Stimulating research cooperation among partners



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2.1 Excellence

Objective 1

Initiating excellent capacity and resources for international cooperation

The goal of Objective 1 is to promote R&I networking measures for collaboration and knowledge transfer to TBU. This can be achieved by actively participating in events and scientific conferences, either as a presenter or a passive attendee, but also submission of EU research projects.

Specifically, to keep up task 7.2 for Objective 1 BayFOR has been actively supporting the coordinator (TBU) under topic HORIZON-CL5-2022-D2-01-05. Furthermore, TBU has been involved in: HORIZON-INFRA-2023-SERV-01-01 and HORIZON-CL5-2023-D2-02-01.

2.2 Networking

Objective 3

Enhancing knowledge transfer towards TBU

Enhancing knowledge transfer towards TBU with trainings, workshops and/or webinars is strongly correlated also with the Objective 8 for Research management and administration. Workshops/Webinars within the first 12 months are planned and have partially been performed:

1. **Prior Kick-off meeting:** In M1, a workshop was conducted to advise TBU's research administration unit on preparing for the kick-off meeting more efficiently. This hop-on workshop was mentioned in the DoA for Work Package 2, specifically for task 2.3. BAYFOR had already completed this workshop before the project's kick-off meeting, as part of their commitment to the project. An extra webinar was held to provide further guidance to TBU's research administration unit, in addition to the previously planned one.
2. **After the kick-off meeting:** EU-workshop for researchers of TBU presenting where and how to find appropriate EU-funds and where to get appropriate support e.g. by NCP, EEN and BayFOR was performed (see also section 3.4).

Workshop on the management workshop is planned jointly together with the road show of the delegation of staff members of the Widening coordinator by mid of the year 2023 (more details on date for the roadshow – see explanation for roadshow in the section 3.1).



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2.3 Reputation

Objective 5

Establishing cooperation with industry players integrating regional battery ecosystem into national and international networks

External Advisory Board (EAB) is created within the first six months of the project and providing feedback to the ongoing development of the project, progress towards the objective, and applicability and economic requirements of the market. The advisory group members will follow the intermediate outputs according to prior signed non-disclosure agreement defined in the consortium agreement. The EAB shall assist and facilitate the decisions made by the General Assembly. The External Advisory Board Member shall assist the consortium parties when implementing the project by providing information, advice and feedback when requested. This objective will be achieved with contribution from all partners.

2.4 Research management and administration

Objective 7

Formulating TBU battery research management and administration strategy

Objective 8

Amplifying the research management capacity and administration skills of TBU

The objective is specifying principles of scientific and management strategy including the upgrade of research management and administration unit (RAU) at TBU that functions as a service point for researchers to assist them in preparing proposals and managing projects. The aim is to bring about a specific change in the organizational setting by providing excellent research teams with knowledge and services that are essential for international research collaboration. For this purpose, a milestone has been set in form of a *Guideline for scientific and management strategy of the consortium*.

2.5 Creativity

Objective 9

Stimulating research cooperation among partners



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In this section main emphasis is given to the dedicated enhancing knowledge transfer towards TBU by staff exchange and roadshow, also strong correlated in Objective 9 Stimulating research cooperation among partners in WP2, task 2.2:

1. Roadshow to research administration units of Bavarian universities working on battery issues
2. International initiatives for the Liaison at BayFOR Brussels and KoWi and also in WP2, task 2.3 for training workshops and/or webinars.



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3 Overall progress and current status

The current status of the Deliverable 7.3 “Plan for widening interactions with EU projects and networks” relates to the task 7.2 “Widening interactions with EU-projects/networks” and aiming at cross-clustering with ongoing EU-funded projects and common workshops (organised by BAYFOR for all EU-funded projects related to battery topics) and initiation of collaborations through engagement in international networks related to battery research and with international networks of research administrations (also with other universities).

In the context of research and innovation (R&I), collaborations and knowledge exchange are essential for progress and success. The following sections provide a detailed overview of different types of collaborations and interactions, namely BayFOR staff exchange and roadshow, BayFOR initiated cooperations, EU project interactions, and wider network interactions. The main planning and preparation have been completed. Some KPIs have already been partially carried out.

3.1 BayFOR staff exchange and roadshow

Twice a year, BAYFOR conducts a short-term staff exchange to support TBU's Research Administration Unit (RAU) in research and administrative management for proposal preparation and project management/administration skills. Due to the need to save time and budget resources, these staff exchanges were conducted online instead of on-site.

Additional to the DoA a second online project management webinar was performed with following content:

- Administrative and financial project management skills (e.g. daily management, support with kick-off, initiation and support of reporting, support with legal, contractual and budgetary affairs, amendments, consortium agreement)
- External communication (e.g. visual identity, communication package, project website)

Moreover, staff exchange, and a delegation roadshow is planned at existing research units of Bavarian universities working on battery issues. The criteria for selection of these Bavarian research units working on Battery for a staff exchange and delegation roadshow are following:

1. **HTA:** Implantation of the Bavarian units within the Bavarian research policy for capacity building initiative of the Bavarian state government, the so called „High Tech Agenda“ (HTA), initiated 2019. Within HTA, the Bavarian state government finance for capacity building initiative, mainly to enhance professorships and research infrastructures for Artificial Intelligence, quantum technology, Aviation/Space and 80 mio. € on battery and mobility;
2. **EU:** Knowledge on how to write EU-Proposals and running EU-funded projects



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3. **BAT:** Their existing international networks on battery issues.

Knowing the criteria of each unit provides an advantage for the TBU coordinator to leverage the unique strengths and experience of each unit according to their specific criteria. Following Bavarian institutes were selected for roadshows with indication of selection criteria from 0 (low, not applicable) to 3 (high) in the order of: HTA, EU, BAT

Unit Nr.	Research units	SE/RS	HTA	EU	BAT
I	Technologiezentrum Energie TZE at Hochschule Landshut (University of Applied Sciences)	RS	0	1	3
II	Institute Machine Tools & Industrial MGT at Technische Universität München (TUM)	SE/RS	3	1	2
III	CARISSMA: Center of Automotive Research at TH Ingolstadt (University of Applied Sciences)	RS	0	2	2
IV	BayBatt: Bavarian Center for Battery Technology at University Bayreuth	RS	3	1	3
V	Fraunhofer-Institut for Silicatresearch ISC in Würzburg	SE	1	2	3

Table 2 Bavarian Research Units

- I. Unit Nr. I (TZE) is not financed by the HTA (0), but as already one battery related EU-project coordinated namely the above mentioned HyFlow (1). Because of its long-term research and development activities of TZE, it is well suited and has large networks of contacts to academia and companies.
- II. Unit Nr. II (TUM) is financed with in HTA with new infrastructures upon new pilot lines and has many funded projects by the federal German ministry but only 2 EU-projects as partner. TUM is well settled in Bavaria for networks and can enhance their international networks.
- III. Unit Nr. II (CHARISMA) is not financed within HTA (0), participating each year in EU-funded battery related proposals and therefore have large international network. Due to their cooperation and proximity to Audi, there are working on issues dealing with batteries on mobility.
- IV. Unit Nr. IV (BayBATT) is the Bavarian Centre of Battery technology. As young centre it will be fully financed by HTA (3) and nominated up to 9 professorships related on battery research and development, which will start up to 2024 with their research activities and therefore a huge



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- potential for TBU to get together with this centre. The professorship is nominated upon their EU-proposal knowledge (1) and upon their BAT (3) related research activities and networks.
- V. Unit Nr. V (ISC) is settled in the north of Bavaria as a publicly funded research institute but not financed by HTA. The different units working on materials, recycling and digitisation issues of battery, annually participating in EU-proposals (2). Because of their participation in EU-proposals and their membership in BEPA, Battery 2030+, with active participation in the task force materials and digitisation of the ETIP Batteries Europe, they have a broad networking capability.

The first two units already approved a road show for a visit of a delegation of TBU in June 2023, the third unit is waiting for approval and remaining waiting till the nominated professorships and laboratory get operative, which leads to delay for an appointment for roadshow.

To save resources on travel time and budget, one round roadshow as indicated in figure 1 of Bavarian roadshow for TBU in one week, planned with the number of pit-stops of host institutes. A dedicated time schedule is needed to be organised with each „pit-stops“ of host institutes for the roadshow, which proves to be challenging to plan. Nevertheless, all five units together have a huge potential for TBU for network activities towards enhancing knowledge transfer towards TBU and cooperation for future EU-proposals.

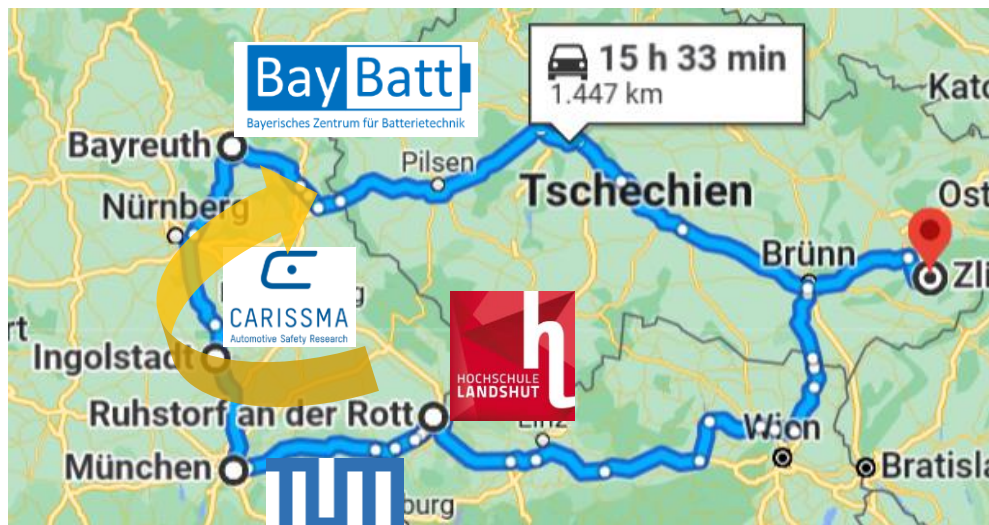


Figure1: Bavarian roadshow for TBU indicating different host institutes for „pit-stop“



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3.2 International cooperations initiated by BayFOR

With the aim to support the research and administrative management (RAU) of TBU, they will be invited at BayFOR's Liaison Office in Brussels and at KoWi webinars and events.

BayFOR has a permanently staffed [liaison office BayFOR](#) in Brussels to represent the interests of Bavarian stakeholders and their international cooperating partners at EU level, which is set up as an independent entity with the legal form of an International Non-Profit Organization (A.I.S.B.L.). The liaison office is involved in international initiatives, committees, bodies and networks (e.g. [European network UAS4EUROPE](#), [UnLiON - Universities Informal Liaison Offices Network](#)), which are represented in Brussels and therefore may support the RAU of TBU to initiate and enhance their networks for cooperation's for strategic partnerships.

[KoWi](#) is the "Kooperationsstelle EU der Wissenschaftsorganisationen" (The EU Liaison Office of the German Research Organisations) which is the joint service platform of the major German science organisations. Annual KOWI performs online webinars and on-site workshops project management, audits and financial and contract management workshops. The events offer practical introduction to the researching funding of the European Union: Annual Conference on EU Research & Innovation Funding for beginners and advanced staff members on EU-Projects, on which staff member of RAU of TBU may participate.

Additionally, BayFOR organises with KOWI a common autumn conference 2023 in Munich on behalf the Bavarian research policy "High Tech Agenda" and their measures to maximise its impact. Policy-makers and researchers from academia and economy participate there and represent therefore a huge platform for RAU staff to enhance their networks.

In summary, contacts for international initiatives with the Liaison at BayFOR Brussels and KoWi have been postponed until the joint event of BayFOR-KoWi. After the event, it is planned to visit the liaison BayFOR to initiate and enhance strategic networks.



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3.3 Ongoing EU projects for cross-clustering

The TwinVECTOR project seeks to collaborate with a number of ongoing and recent large-scale R&D initiatives at both European and national levels. This collaboration is aimed at exploring opportunities for partnership, particularly with EU projects listed in table 3, among others. The direct involvement of consortium partners in some of these projects will facilitate cooperation and enhance their outcomes with the aim of sharing knowledge, best practices, and lessons learned to improve the overall success of both projects.

StoRIES/EERA

The H2020 project StoRIES project was conceived to address the challenge of improving the economic performance of storage technologies, through the collaboration of a consortium comprising of European Strategy Forum on Research Facilities facilities, technology institutes, universities, and industrial partners. The main technological objectives of the project are centered on the development of energy storage, with a focus on optimizing hybrid energy systems and improving materials for devices, leveraging access to world-class research infrastructures and services. StoRIES also aims to analyse socio-technical and environmental aspects of new developments and systems and provide training and education on these issues.

Coordinated by KIT in Germany, the EERA Joint Programme on Energy Storage (JP ES) was established in 2011 with the aim of efficiently developing new energy storage technologies and supporting the objectives and priorities of the SET Plan by pooling and integrating activities and resources on all levels of the value chain, including international partners. The JP ES promotes synergies through collaborations within the programme and with other joint programmes, leading to long-term and durable integration of European research capacities in energy storage. By linking strongly to industrial partners, the programme supports the transfer of research outcomes to innovation and products, with the ultimate goal of establishing strategic European leadership in energy storage.

Currently, 39 research organizations and universities from 15 European countries are participating in the JP on Energy Storage, including TBU. One of the key priorities for SP1 Electrochemical Energy Storage is to focus on batteries and electrochemical storage systems as two of the primary enablers for the green energy transition in the transportation sector, particularly with regard to incorporating intermittent supply from renewable sources. SP6 - Energy Storage: Technoeconomics and Sustainability plays an important role within the individual sub-programmes as well as in cross-linking the respective technologies.

Collaborating with StoRIES and EERA seems like a strategic fit for TwinVECTOR, especially since both initiatives focus on energy storage technologies. StoRIES includes a diverse group of 17



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partners, including technology institutes, universities, and industry representatives, as well as 31 associated participants from 17 countries. TBU plays a role in the StoRIES project as a linked third party, contributing mainly with its infrastructure, but also expertise and resources towards the project's objectives. This presents a great opportunity for TwinVECTOR to expand its network and benefit from the knowledge and expertise of these partners. While StoRIES has a broader focus on energy storage technologies, TwinVECTOR is specifically focused on battery-type energy storage technologies.

LiBASED

The **LiBASED** consortium is working on developing a novel Li-ion battery-supercapacitor hybrid device that combines the benefits of high-energy battery electrodes and high-power capacitors. The goal is to achieve high power and energy density simultaneously, while ensuring good cyclability.

Cooperation with the LiBASED project provides a valuable opportunity to leverage their innovative research outcomes in the development of more efficient and sustainable energy solutions. By collaborating with the LiBASED project, we hope to gain access to cutting-edge technologies and insights that can inform our own research and development efforts, and ultimately help us deliver more sustainable and cost-effective energy solutions the field of energy storage.

SOLiD

The **SOLiD** project proposes sustainable manufacturing methods for Gen. 4b solid state batteries. These methods aim to minimize the use of critical raw materials (Co and Li) while ensuring superior performance and safety. Protective layers make it possible to use NMC811 with a minimum amount of Co, without compromising the battery's lifespan. Additionally, the PLD process minimizes the thickness of Li. Dry coating eliminates toxic solvents and energy-consuming drying steps, while digital quality control reduces waste. The thickness of each layer will be minimized to achieve an energy density above 900 Wh/l. Cost-effective production methods and maximizing yield will help reduce costs. The solid electrolyte and protective interlayers guarantee safety and a long cycle life. By adopting a life-cycle thinking approach and involving stakeholders, the SOLiD project aims to design a sustainable solid-state battery factory for the future.

TBU supports the consortium with the environmental, economic and social impacts assessments of the developed SOLiD cell structures in comparison to the reference cells in pre-defined assessment phases. TBU will also contribute to basic physico-chemical and electrochemical characterizations for optimization of SPE.

FrontSeat



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The goal of FrontSeat is to enhance the research and academic opportunities available at the Slovak University of Technology in Bratislava, Slovakia (STUBA). The project aims to transform STUBA into a prestigious, modern institution that conducts cutting-edge research in advanced automatic control, produces high-quality scholars and industry professionals, and effectively shares its research and innovation achievements with an international audience.

TwinVECTOR coordinator Viera Pechancova is nominated as the member of External Advisory Board of FrontSeat.

EPIBOOST

Funded through the HE programme for Widening participation and spreading excellence as a Twinning Action, the EPIBOOST project brings together the Widening coordinator UAVR (PT) with internationally renowned partners UGent (BE) and CSIC (SP). Together, these partners aim to enhance research excellence in the emerging field of environmental epigenetics, particularly in environmental assessment. This collaboration creates a mutually beneficial scenario within the consortium, as it is a new research area that is still in its infancy.

TBU coordinator Viera Pechancova is member of the focus group with the aim for the elaboration of a Good Practices guide on the management of Twinning CSAs.

HyFLOW

The EU-funded project HyFLOW develops a modern and sustainable Hybrid Energy Storage System that is capable of meeting high-energy and high-power demands to decrease the global environmental impact. Regarding the cooperation with TBU, a common workshop within the roadshow of TBU at the labs of the coordinator of HyFLOW is under consideration.

RecyLIB

RecyLIB is funded within ERA-MIN3 under the grant agreement number JTC-2021_267 and is aiming towards direct recycling of lithium-Ion batteries. A circular battery value chain as proposed in this project offers the potential of utilizing up to 40 % of recycled materials in the battery production by 2050.

In the table 3 below the overview of all relevant projects is summarized.



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Project	Relevance to TwinVECTOR	Partners involved	Plan
H2020 project StoRIES (GA No 101036910)	StoRIES addresses European Green Deal objective to ensure that the EU achieves climate neutrality by 2050, focusing on the energy sector, which is to be transformed with a consistent shift towards electricity generation based on renewable energies.	TBU, KIT, VTT, AIT	Ongoing participation as linked third party
M-era.Net LiBASED (TH71020006)	"Li-ion BAAttery-SupErcapacitor Hybrid Device". M-era.Net project on battery-supercapacitor hybridisation, coordinated by TBU.	TBU	Ongoing as coordinator
H2020 project ENERGY SHIFTS (GA No 826025)	H2020 project "Energy Social sciences & Humanities Innovation Forum Targeting the SET-Plan" where we participated in the Early-Stage Researcher programme.	TBU	Potential Follow-up
H2020 project SHAPE ENERGY (GA No 731264)	The TBU was one of the consortium partners in the finished H2020 project "Social Sciences and Humanities for Advancing Policy in European Energy".	TBU, KIT	Potential Follow-up
H2020 project HIDDEN (GA No 957202)	HIDDEN develops self-healing Li metal batteries. The gained knowledge can be used to support the TwinVECTOR project.	VTT	VTT partner as a coordinator
H2020 project SYNERGY (GA No 952169)	Synergy aims to strengthen the scientific and technical competences of Portuguese institutions in the field of energy harvesting and micropower management as a key component towards self-sustainable smart electronic platforms on flexible substrates.	VTT	TWINNING action with VTT engaged
H2020 project HyFLOW (GA No 963550)	EU-funded Battery project on Hybrid Energy Storage System, coordinated by Hochschule Landshut. Development of a sustainable hybrid storage system based on high power vanadium redox flow battery and supercapacitor-technology.	BAYFOR	BayFOR in charge of project management, dissemination and communication activities, e.g. conferences, exhibitions



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ERA-MIN3 RecyLIB (JTC-2021_267)	Direct Recycling of Lithium-Ion Batteries for circular economy.	BAYFOR	BayFOR in charge of dissemination and communication activities, e.g. conferences, exhibitions
Horizon EUROPE project SOLiD (GA No 101069505)	The SOLiD project will create a sustainable and cost-efficient pilot scale manufacturing process for a high energy density, safe and easily recyclable solid-state Li-metal battery.	VTT, TBU	TBU beneficiary
Horizon EUROPE project FRONTSEAT (GA No 101079342)	The project aims at increasing the research and academic prospects of Slovak University of Technology in Bratislava, Slovakia (STUBA) and at initiating the evolution of STUBA into a modern, reputed excellent institution that performs high-quality research in advanced automatic control, educates top-quality scholars and industrial practitioners, and is successful in active dissemination and exploitation of its research and innovation efforts.	TBU	Sister TWINNING project, the coordinator proposed for External Advisory Board
Horizon EUROPE project EPIBOOST (GA No 101078991)	The European project EPIBOOST - BOOTSING excellence in environmental EPIgenetics funded by the Horizon Europe Program, under the transversal pillar Widening Participation and Spreading Excellence - Twinning action, formally started on October 1st, 2022 and runs for three years. This is a capacity building project under coordinated by the University of Aveiro (widening partner) with two advanced partners, Ghent University and Consejo Superior de Investigaciones Científicas.	TBU	Participation at sister TWINNING projects focus group

Table 3 Ongoing projects for cross-clustering



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3.4 TwinVECTOR consortium extended networks

Furthermore, the partners plan to leverage their involvement in European networks to engage with relevant stakeholders and the scientific community. TBU, KIT, and AIT are participating as associate members in the European Energy Research Alliance (EERA) Joint Programme Energy Storage, while TBU and AIT are members of the European Association for Storage of Energy (EASE). AIT is also involved in the International Smart Grid Action Network (ISGAN) through Mission Innovation. BAYFOR, as an associated partner in the private sector (BEPA) of the EU-Partnership BATT4EU and also in the AMBP of RIS3, will increase awareness and visibility for TBU in the international battery community to pursue partnerships and collaborations (see table 4).

Within following events, TwinVECTOR was actively presented:

- BayFOR organized online EEN-Brokerage event with speaker from German NCP and BEPA on “*EU Calls for Proposals 2023 on Battery and Hydrogen Technologies*” on 14 February 2022
- BayFOR organized on-site event at Regensburg/Germany “*MSCA DN and Twinning on Materials & Processes and Artificial Intelligence*” with speaker from DG Grow on Teaming and Twinning on 23 – 24 Mar 2022
- One of the EERA/StoRIES events organized with the TwinVECTOR participation was the event *Energy Conversion and Storage days* on 21 - 23 March 2023 and the *StoRIES – EERA JP ES Workshop on Applications for Hybrid Energy Storage* on 23 March 2023.

Further, contacts have been established with the Czech NCP regarding TwinVECTOR communication, with JRC regarding stakeholder consultation about Battery Regulation, and Sustainability through Life Cycle Approaches Network of Excellence at Imperial College London.



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Network	Description	Partners involved	Plan
EERA	Joint programme for Energy Storage EERA ES is the first pan-European programme to bring together all major fields of energy storage research. The EERA Joint Programme on Energy Storage (JP ES) was officially launched in 2011 and is coordinated by KIT . This JP strongly fosters the efficient development of new energy storage technologies and supports the SET Plan objectives and priorities by “pooling and integrating activities and resources including international partners” on all levels of the value chain.	TBU, KIT, VTT	Ongoing membership
EASE	The European Association for Storage of Energy located in Brussels, Belgium, is the leading member-supported association representing organisations active across the entire energy storage value chain. EASE supports the deployment of energy storage to help with the cost-effective transition to a resilient, climate-neutral, and secure energy system.	TBU, KIT	Ongoing membership
ECP4	The European Composites, Plastics and Polymer Processing Platform ECP4 is an industry-driven collaboration that unites members from 13 countries amongst the top-level European research institutions, regional plastic clusters, and EU-level industrial organisations of plastics and composites converters.	TBU	Ongoing membership
PPS	Polymer Processing Society covering >600 institutions globally, using polymers in energy and electronics identified as one of key emerging topics.	TBU	Ongoing membership



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RIS3	The project topic corresponds to the smart specialisation priorities identified for the Czech Republic (RIS3) based on the entrepreneurial discovery process in the area of Advanced machinery/technology for strong and globally competitive industry - energy industry. Zlín region RIS3 strategy is relevant in the following destinations: innovative polymers for circular economy and creative industries.	TBU	Ongoing membership
AMBP	BAYFOR is Bavarian representative in the inter-regional Advanced Materials for Batteries Partnership (AMPB) for Electro-mobility and Stationary Energy Storage, an initiative within RIS3 in the Industrial Modernisation.	BAYFOR	AMBP is up to now on hold
BEPA /BATT4EU	BAYFOR is associated member in the recently founded BEPA (Batteries Europe Partnership Association) which is the private sector of the EU-partnership BATT4EU.	BAYFOR KIT, VTT	TBU membership under consideration
BATTERIES EUROPE	Batteries Europe is the European technology and innovation platform of the European Battery Alliance. BAYFOR is member as Bavarian representative in NRCG (national, regional coordination group)	BAYFOR KIT, VTT	BayFOR participation in the Task force of Digitalization on battery value chain
Battery 2030+	Battery 2030+ is a large-scale EU research initiative to support development of batteries of the future.	VTT, KIT	Consortium members (VTT, KIT)

Table 4 TwinVECTOR consortium extended networks



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4 Conclusion

The primary objective of deliverable 7.3, which is the PLAN FOR WIDENING INTERACTIONS WITH EU PROJECTS AND NETWORKS, is to initiate partnerships with EU-funded projects through cross-clustering and joint workshops organized by BayFOR, with the ultimate aim of advancing research related to batteries across all EU-funded projects. Additionally, the deliverable outlines a strategy for pursuing new or existing collaborations with international networks engaged in battery research, as well as research administrations at other universities, in order to promote cooperation and exchange of knowledge. In summary, staff exchange, roadshows, EU project interactions, and wider network collaborations are all valuable strategies for promoting knowledge transfer, collaboration, and innovation in R&I.

References

- [i] Grant Agreement number 101078935 – TwinVECTOR, available in F&T portal ([click here](#)).
- [ii] Consortium Agreement, available to the consortium in the protected MS SharePoint area.
- [iii] Horizon Europe Online Manual, available in F&T portal ([click here](#)).



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