



**NETWORK OF RESEARCH PILOT LINES  
FOR LITHIUM BATTERY CELLS**

D6.4

Policy Briefs

### Deliverable Information

---

<b>Related work package(s)</b>	<b>WP 6</b>
<b>Contractual date of delivery</b>	<b>M12</b>
Actual date of delivery	M12
Author (s)	Ilka von Dalwgik (KIC SE)
<b>Lead beneficiary</b>	<b>EIT InnoEnergy (KIC SE)</b>
Contributing participants	TUBS
Estimated person months used	1
<b>Dissemination level</b>	<b>Public</b>
Nature	Policy Brief

### Project Information

---

Project title	Lithium battery cell pilot lines network
Project acronym	LIPLANET
Project call	H2020-LC-BAT-2019-2020 (CSA)
<b>Grant number</b>	<b>875479</b>
Project duration	01.01.2020 – 31.12.2021



This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 875479

## Executive Summary

---

LiPlanet aims at creating a more competitive lithium battery cell manufacturing ecosystem and increase the production of lithium battery cells towards industrial scale.

The Policy Brief is guiding the reader through the key milestones that brought to the identification, at a European level, of Batteries as a strategic asset in the transition to a low carbon-economy.

When it comes to the European Batteries Ecosystem, LIPLANET is well placed to address the challenge of training experts and engineers on a technical level, especially for battery cells mass production. LiPLANET is already preparing concepts and is also cooperating with other European initiatives and projects, such as Allbatts, Battery 2030+ and ETIP Batteries Europe on the topic of skills and education. LiPlanet creates synergies, favours collaboration between industry and academia, and, most importantly increases through all of its activities the basis of trained experts.

The ambition is to develop this initiative into a self-sustaining network. In order to build on the current structure and results, particular attention will be needed to ensure that the activities of LiPLANET are continued after end of the current CSA to avoid a break-up of the network.

Expert Groups are now in the process of being established and as soon as they are set up and running, concrete recommendations and best-practice examples will be elaborated and will influence the next policy brief in December 2021. More details on the implementation of the network and its ambition are illustrated along this deliverable.

## Table of Content

---

1	Introduction .....	4
1.1	LiPLANET in brief .....	4
1.2	Scope and objective of this deliverable.....	4
2	Policy Brief .....	5
2.1	European Research Pilot Line Networks and their role in Accelerating Sustainable Large-Scale Battery Manufacturing in Europe .....	5
2.2	LiPLANET in the Batteries Ecosystem .....	6
2.3	LiPLANET Expert Groups, what to expect? .....	7
2.4	Conclusions .....	10

## 1 Introduction

Europe needs to develop domestic manufacturing capacities of sustainable batteries to build a truly competitive and resilient European Battery value chain. A powerful innovation and production ecosystem, such as the LIPLANET network, plays a key role in the European battery ecosystem and accelerates the transfer of research results into industrial application in battery manufacturing.

### 1.1 LiPLANET in brief

The overall objective of the LiPLANET project is to create a European innovation and production ecosystem and reinforce the position of the European Union (EU) in the lithium battery cell manufacturing market. LiPLANET plans to build a more competitive lithium battery cell manufacturing ecosystem and increase the production of lithium battery cells towards industrial scale, by bringing together the most relevant European lithium battery cell pilot lines and the main stakeholders of the battery sector. The project LiPLANET lays the foundation for a network of battery cell pilot lines in Europe. This network allows to exploit synergies between pilot line operators, identify knowledge and equipment gaps, organize joint trainings as well as, favour collaboration with industry and academia, and facilitate the access to market.

For this purpose, different activities are followed throughout the project:

- mapping of the European lithium battery cell pilot lines and implementation of a network,
- creation of a standardized legal framework and a data exchange platform for the cooperation between industry, academia and pilot lines,
- round-robin test to compare qualification methods,
- development of a roadmap for joint strategies of the network towards industrial scale battery cell production in Europe.

### 1.2 Scope and objective of this deliverable

A policy brief can be described as a short document that presents findings and recommendations on a certain topic to policy makers. The aim of this deliverable is to raise awareness of the EU policy-makers about LIPLANET as an important element in the European battery ecosystem and that a continued support to this network activity is an effective way to incentive the growing European battery industry and provides the infrastructure for training that is on a technical level, especially for mass production.

The policy brief will be forwarded to relevant stakeholders in the European Commission. It will also be published on LIPLANET's website and social media channels. The policy brief will also feed the dissemination events foreseen in WP6 and the final conference.

## 2 Policy Brief

### 2.1 European Research Pilot Line Networks and their role in Accelerating Sustainable Large-Scale Battery Manufacturing in Europe

The future is electric, and batteries are at the core of this transition to a low carbon-economy. The need for efficient batteries – for transport, power and industrial applications – is growing fast and at an increasing pace. The availability of capable and sustainably produced batteries, and the skills to produce them, is thus a prerequisite to sustain the rapid migration from fossil to electric.

In this transformation it is not only a business imperative to support the European automobile industry and thus to maintain the corresponding jobs, but also an industrial opportunity to strengthen the competitiveness of Europe and facilitate the overall energy transition, leveraging technological excellence and a strong industrial base on European soil.

The European Commission Vice President Maroš Šefčovič launched in 2017 the European Battery Alliance (EBA) to address this challenge and create a competitive and sustainable battery cell manufacturing value chain in Europe. There is a strategic need to develop domestic manufacturing capacities of sustainable batteries.

Large-scale battery manufacturing is a complex process that includes many consecutive process steps. Already the actions developed by key stakeholders, as part of the EBA250 network under the European Battery Alliance, emphasised that sufficient and key human capital skills are missing in Europe especially on applied process design and cells manufacturing. The need for a competitive European knowledge in battery technology and battery cell production has therefore lead to many non-industrial pilot lines recently established all around Europe. However, being small on a global scale, each pilot line alone can hardly keep up with the advancements of battery cell production, particularly in Asia.

Mutual exchange of data, expertise, and access rights between these pilot lines is hence crucial in order to maximise the benefits of Europe battery related efforts.

These challenges were acknowledged by the EU Commission who in the Strategic Action Plan on Batteries agreed to work with relevant stakeholders to create links between the educational network and the European pilot line network to gain manufacturing experience and know-how that ultimately led to the launch of the LIPLANET network.

## 2.2 LIPLANET in the Batteries Ecosystem

LIPLANET, a Coordination and Support Action under Horizon 2020, established in January 2020, is a first step in ramping up manufacturing skills. Research pilot lines for the production of lithium battery cells, such as LIPLANET, constitute a crucial infrastructure resource for training and education of experts. An open pan European network is a common resource for sharing knowledge, trainings and education and offers education and training for new high qualified and skilled operators. Additionally, LIPLANET will foster the development of the production of Lithium battery cells from small batch testing towards industrial scale in Europe through the creation of a network of Lithium battery cell pilot lines integrating industrial stakeholders. Cooperation between industrial and academic partners will be strengthened in order to identify knowledge and equipment gaps and to set standards. By organizing joint trainings and workshops, the existing gap between materials research and development and the industrial production of battery cells will be closed, thus enabling efficient and safe scale-up.

Especially education and training have been identified as very important topics by members of the consortium, both internally (between pilot lines) and externally (as offer/knowledge exchange for industry lines, research and schools/universities). LIPLANET is already preparing concepts and is also cooperating with other European initiatives and projects, such as Allbatts, Battery 2030+ and ETIP Batteries Europe on the topic of skills and education. LIPLANET is well placed to address the challenge of training of experts and engineers on a technical level, especially for mass production.

LIPLANET plays therefore a key role in the European battery ecosystem. Through its activities the network accelerates innovation and production of battery cells towards industrial scale in the EU, it creates synergies, favours collaboration between industry and academia, and, most importantly increases through all of its activities the basis of trained experts. Furthermore, LIPLANET empowers the development and upscaling of innovative, sustainable and competitive lithium battery cells and process equipment towards European industrial scale production. LIPLANET will build up on the just yet published Strategic Research Agenda on Batteries<sup>1</sup>, by reinforcing the aspects that make European industry capable to feed the demand of innovative battery cells production in medium to large series. This is also well in line with the recommendation that calls on national and regional authorities to invest in and support the establishment, advancement and collaboration of open research infrastructures for battery research within Universities and Research & Technology Organisations (RTOs).

---

<sup>1</sup>[https://ec.europa.eu/energy/sites/ener/files/documents/batteries\\_europe\\_strategic\\_research\\_agenda\\_december\\_2020\\_\\_1.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/batteries_europe_strategic_research_agenda_december_2020__1.pdf)

## Our vision for the European network of research pilot lines for lithium battery cells

### LiPLANET in 2030

Europe benefits from a powerful **innovation and production ecosystem** built upon a **strong, self-sustaining network**. The LiPLANET network is the **one-stop-shop service provider for education, knowledge transfer, testing, certification and pilot scale production** of **lithium and post-lithium** battery cell technologies for **research, industry and authorities**.

It is achieved through:

- ✓ connecting and integrating the R&D battery cell pilot lines all around Europe, being **inclusive** towards industrial and non-industrial stakeholders,
- ✓ promoting the **combined and individual features and capabilities** of the pilot lines,
- ✓ accelerating application of **circular economy** and **Industry 4.0** in battery cell production,
- ✓ establishing the **competencies, standards, value chains, and unique selling propositions**,
- ✓ fostering **training and education** as well as the **exchange of knowledge and best practices**,
- ✓ conjoining with **complementary initiatives, projects and pilot lines**,
- ✓ aligning with the **European strategies on sustainability and batteries**<sup>1</sup>.

LiPLANET empowers the development and upscaling of **innovative, sustainable and competitive lithium battery cells and process equipment** towards **European industrial scale production**.

### 2.3 LiPLANET Expert Groups, what to expect?

The first LiPLANET policy brief will not be influenced by the expert groups, due to the fact that they are not implemented yet. As soon as said groups are set up and running, concrete recommendations and best-practice examples will be elaborated and will influence the next policy brief in December 2021. The following paragraphs will give an overview on how the expert groups will be structured and how their work will influence the next policy brief.

The expert groups incorporate a significant role in LiPLANET, as they are the main networking and exchange point within the network. Their main goal is to foster the exchange between the LiPLANET network members. Within an expert group, topics that are of interest for that group, can be worked on with all the participants being able to contribute to the discussion. The Groups will then be able to identify the steps that are needed to further advance the project through workshops, trainings or collaborations with other expert groups.

The key issues to work on by the expert groups are:

- **Scientific Exchange:** New discoveries, papers and interviews will be shared. This includes both the work that has been done by LiPLANET members and work from non-members. Research that might be of interest for the whole network will be mentioned in a regular newsletter. More topic specific research will be circulated within the expert group.
- **Exchange of experience:** In order to find further opportunities to increase energy and resource efficiency in battery production, the members experience on yield quotas, energy demands and cell quality will be shared.
- **Education:** In collaboration with the industry and academia, the expert groups will develop new concepts to strengthen European battery production. This can be new university courses or trainings and educational videos for already operational production facilities.
- **Benchmarking/ comparison:** Production processes and measurement methods will be compared in order to identify opportunities for growth within the member's facilities.
- **Best practice:** Best practice identification regarding production processes (e.g. in terms of process speed, flexibility, resource and energy efficiency) and measurement methods.
- **Information material and summaries of core findings:** These will be prepared by the expert groups to be provided to task 3.2.1 and WP6 for distributing results to associated partners and the public.
- **Work on new topics together:** As issues may overlap between the expert groups, an exchange between the expert groups is desired.

The groups themselves are made up of personnel from the participating pilot lines, and allocated to the suitable group according to their specific expertise. They will elect a chair from within the group, using an informal election process. These group chairs will lead and organize the meetings for the groups, that will occur on a regular basis. They will be responsible for the communication with the other expert group leaders and the LiPLANET executive board.

So far, six groups with a respective topic have chosen and will be initialised:

Group 1) – Materials Processing and Safety

Group 2) – Production Technology and Sustainability

Group 3) – Cell Design and Recyclability

Group 4) – Education and Training

Group 5) – Scientific Exchange and IP (Round Robin)

Group 6) – Digitalisation, Measurement Methods and Quality

A detailed description of the different aspects can be found in Deliverable 3.2 – Expert group setup.

Due to the diverse setup up of topics for expert groups and the different key issues mentioned above, a big variety of input will be elaborated and influence the future policy brief. In order for this to happen, the input, that comes from many sources, has to be clustered. The approach for this will be a bottom-up one. The reasoning behind this is that the ideas most likely come from those persons that actually work on the pilot lines, technicians and scientists. These persons, however, usually don't have the connections to issue these ideas to the policy makers. Uniting their recommendations into one document will vastly increase their chance to be implemented by policy makers, especially if synergies and the reach of the network is being used.

The flow for the clustering will start in the expert groups, where the recommendations are issued. The chairs will exchange and align them at a bi-monthly conference between the expert group chairs (most likely in a virtual fashion). The collected recommendations will then be given to the executive board, which is also present at these conferences. They have the chance to review the recommendations. Within the executive board, consortium members of the LiPLANET project will be present, who will make sure that the author of the future policy brief will receive the consolidated recommendations. The flow from the members input to the policy brief can be seen in Figure 1.

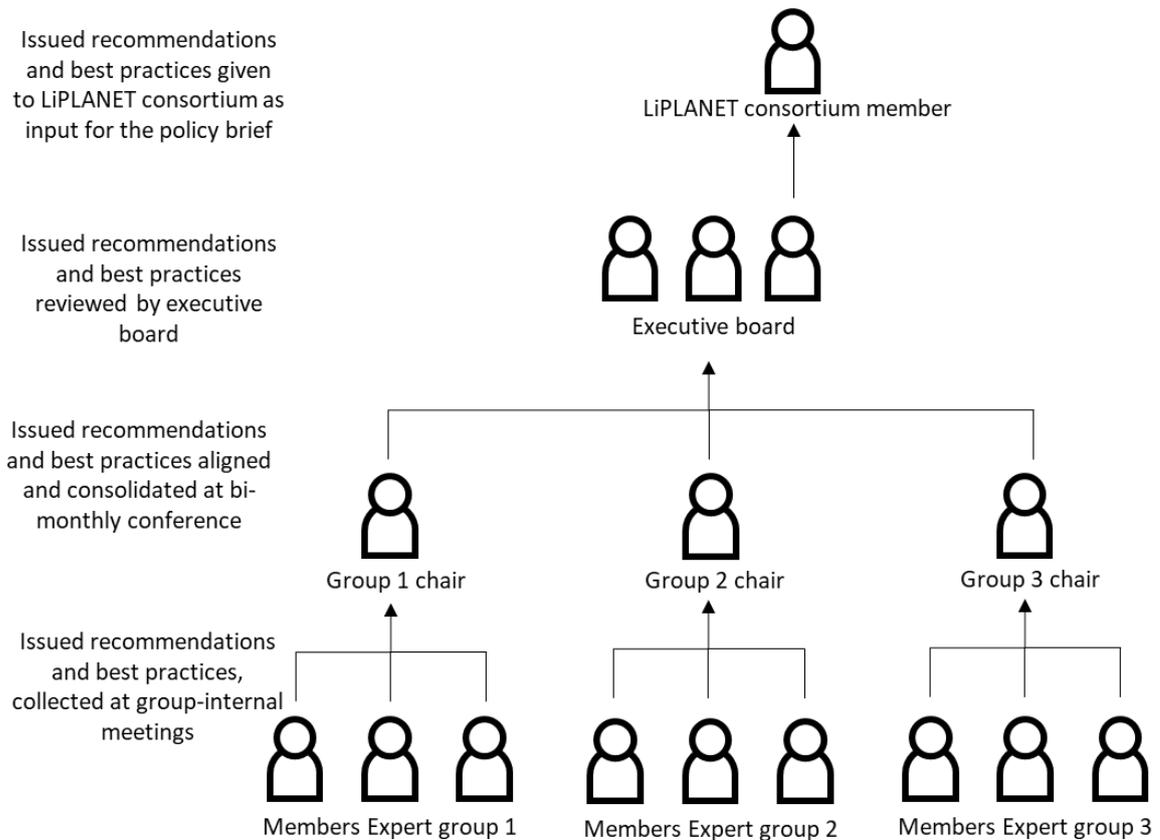


Figure 1: Information flow for the LiPLANET policy brief, using a bottom-up approach

## 2.4 Conclusions

The European battery industry benefits from a powerful innovation and production ecosystem built upon a strong and inclusive network such as LIPLANET. Each pilot plant alone cannot keep up with the advancements of the rapidly evolving battery cell production technology and industrialisation. In order to maximize the benefits of European battery related efforts, mutual exchange of data, knowledge, expertise between these pilot lines, facilitated by an efficient management of access rights, is crucial. It is therefore important to ensure a continuity for the network that currently is established. The ambition of LIPLANET is to develop this initiative into a self-sustaining network. This is planned to be achieved by the establishment of a more formal network, possibly in form of an association. Different ways on how to ensure the continuity of the network will be further explored in the coming year of the current project. Among others the participation of the future LIPLANET association in EU projects, e.g. working on dissemination, is in discussion. By building on best-practices, a stable network of pilot lines for lithium battery cells will help Europe to address the challenge of training of experts and engineers for battery cells mass production;; extending the network by including new pilot-lines from Members States currently not part

of this network will also accelerate the deployment and support training activities in these Members States.

A long term-financial stability for the operation of each of the pilot lines is also an important aspect for National funding schemes to take into account if they want to address the challenge of access to sufficient trained experts for the growing battery industry.

This is also well in line with the recommendations published in the recent SRA by ETIP Batteries Europe that calls on both national and regional authorities to invest in and support the establishment, advancement and collaboration of open research infrastructures for battery research within Universities and Research & Technology Organisations (RTOs).