



The EU Battery Passport: Everything You Need to Know

Requirements, Timelines & Benefits

Term Glossary

EU Green Deal:

The EU Green Deal is a comprehensive plan to make the EU climate-neutral by 2050, safeguard biodiversity, establish a circular economy and eliminate pollution, while boosting the competitiveness of the European industry and ensuring a just transition for the regions and workers affected.

Circular Economy Action Plan:

Devised by the European Commission, the Circular Economy Action Plan aims to transition the European Union towards a sustainable economic model, minimizing waste and maximizing resource efficiency.

Battery Regulation:

The Battery Regulation is a legislative framework of the EU Green Deal aimed at promoting sustainability, safety and circularity in the design, production and disposal of batteries within the European Union.

Market Overview

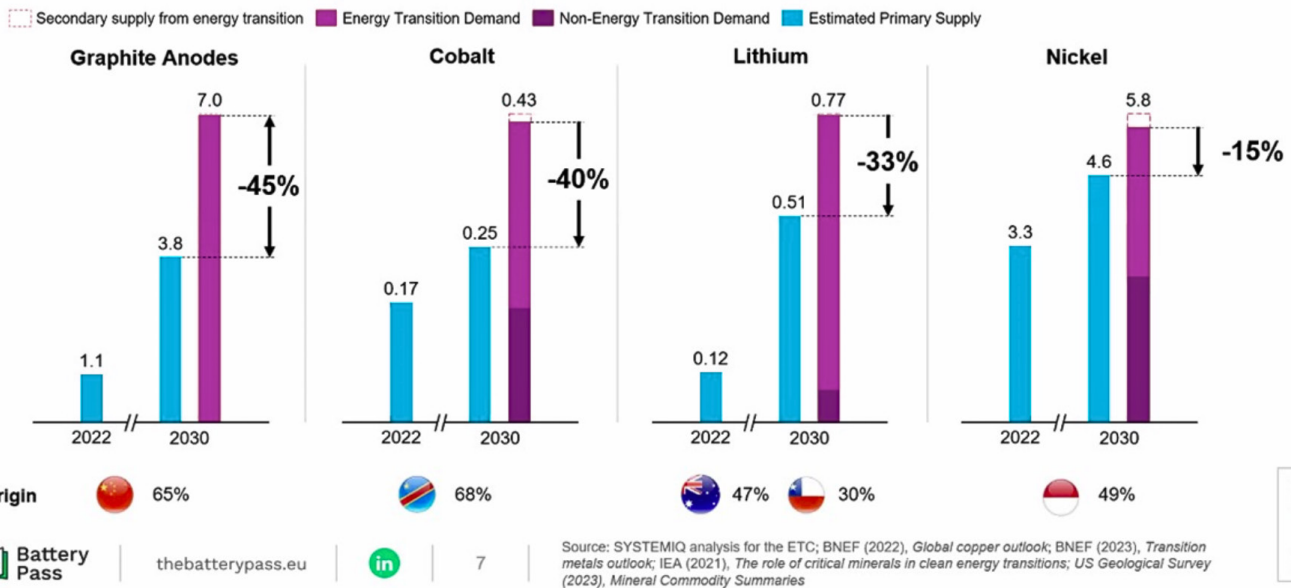
The global battery market is multiplying every year, with an estimated compound annual growth rate of 14% by 2030¹. While this is a trend affecting multiple sectors, the transition of the transport industry to electric is a major factor in increasing demand for batteries and their key materials. To promote sustainability and circularity, the European Union has implemented a Battery Passport directive to mitigate the impact of increased demand.

This policy encourages producers of batteries to reduce the demand for virgin materials per battery and enables the infrastructure for widespread recycling to increase battery life. In reaction, China is tightening the export of raw materials for batteries², meaning that producers of batteries in the United States and the European Union are feeling the effects of constrained inputs.



Though, estimated supply growth for key battery materials is insufficient to meet the rapidly rising demand and dependency on single countries is high

Global battery key material demand and supply in 2030, million metric tonnes



Source: Battery Pass – Global Battery Key Material Demand and Supply Chain in 2023

Looking at the resource forecast of key battery material, the rapid battery demand will be challenged by the lack of resources such as cobalt and lithium. This scarcity requires comprehensive resource management, including recycling, and necessitates the battery passport regulation’s sustainable results.

What is the EU Battery Passport?

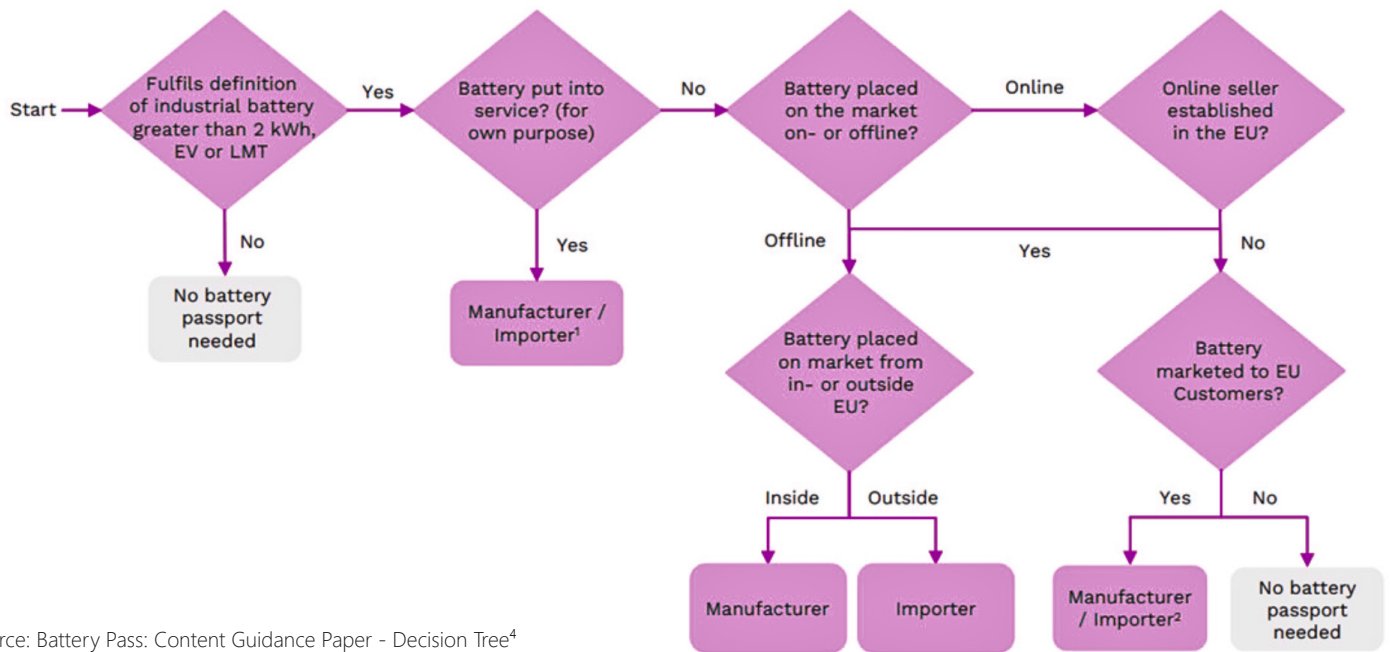
The upcoming EU Battery Passport Directive³ is one initiative that is part of the EU Circular Economy Action Plan and EU Green Deal. Under this directive, producers and importers of batteries to the EU will have to provide a Digital Product Passport (DPP), a digital document that provides information about a battery’s environmental footprint, material origins, durability, reparability and recyclability. The regulation covers large batteries above 2 kWh, mainly with transport, industrial and electric vehicle (EV) applications, among others. This will make battery production more sustainable and give consumers comparable information when they are deciding between alternatives in a purchase decision. The EU Battery Regulation is the first product legislation encompassing the entire life cycle with the aim to ensure batteries are sustainable, circular and safe.

Who is Responsible for the EU Battery Passport?

The responsibility lies with the economic operator who places a battery on the market or puts it into service.

- **Manufacturers** that design batteries or put them on the market
- **Importers** that put batteries on the market from a third country

Decision tree determining the type of economic operator responsible



Source: Battery Pass: Content Guidance Paper - Decision Tree⁴

The Role of Traceability in Meeting the Battery Passport Requirements

As with corporate sustainability in general, traceability plays a crucial role when developing a digital passport system for any operator. By connecting the entire supply chain, Tracking & Tracing solutions provide real-time visibility across global value chains, harmonizing product information from raw material to end-of-life. In addition to the reporting of this data through the Digital Product Passport (DPP), companies must consider the data sources along the supply chain, how much data that amounts to and how that data will integrate with existing manufacturing processes.

Operators in the battery industry can look nearby to the pharmaceutical and luxury sectors to get an idea about the further benefits of improved traceability beyond basic compliance. For example, battery producers can expect to benefit from:

- **Access to comprehensive and reliable information**

Not only consumers make decisions, but businesses as well. By gathering data on individual batteries, entire datasets become available, allowing for better business planning and decision making for operators.

- **Improved business processes and automation**

By setting up reliable serialization processes, the value chain is primed for automation and optimization.

- **Increased sustainability and a strong basis for impactful corporate social responsibility**

The requirements of the battery passport lay the groundwork for generally improved sustainability processes. Managing detailed data on the carbon footprint, circularity and battery efficiency enables improving the metrics beyond the tracking. The regulations will progress in this direction too with carbon performance classification in 2026 and required recovery rates in 2027.

How to Meet the Requirements of the EU Battery Passport Directive

As with any regulation, there is a lot for companies to know at different phases. This is where a compliance expert comes in.

The regulation covers large batteries above 2 kWh, mainly with transport, industrial and EV applications, among others. To be compliant, manufacturers and other economic operators must provide information about their carbon footprint, materials sourcing, circularity and item history with the following considerations:



Each Battery Must be Unique

The basic principle of the DPP is that the history and information for each battery can be viewed immediately. To enable this, each battery must be uniquely identified and have a QR code to retrieve and verify the relevant information.



Information Must be Current and Accurate

The information included in the DPP must be accurate, complete and up to date. This responsibility applies not only to the economic operator but anyone storing data or performing operations on their behalf.



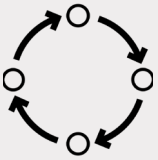
Materials Must be Responsibly Sourced with Proven Origins

The most resource-intensive phase of battery production is the raw material sourcing and extraction. Because of this, the DPP must include information on where and how these materials are sourced, ultimately enabling end users to make informed decisions and improving the sustainability of the entire supply chain through increased transparency.



Carbon Impact Must be Measured

The carbon footprint of the battery will be the first phase of the regulation in the DPP. The information that must be provided at this phase includes the breakdown of carbon released at each life cycle stage. By August 2026, batteries will also be categorized into performance classes based on this carbon footprint information.



The Circularity of Materials

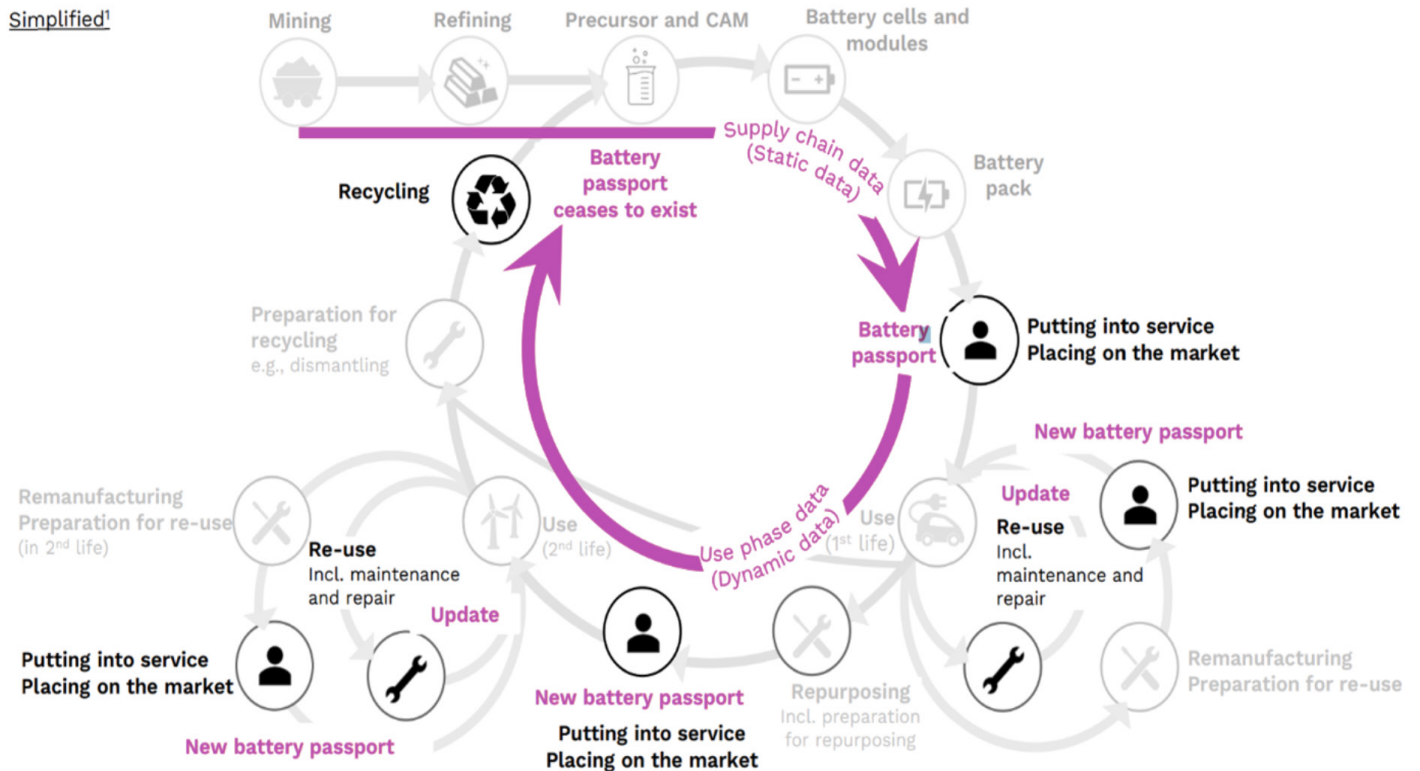
A key part of the circular economy is the plan for the end of life of materials. To enable this goal, the DPP must provide safety information for recyclers and refurbishers. This includes directions on how to safely disassemble the battery, a record of what % of the battery has already been refurbished and how this affects the lifespan, spare parts information and waste collection.



Performance Information Must be Available

The DPP should include information on the capacity of each battery, along with estimated lifetime data in either years or battery cycles. In addition to the lifetime and capacity information, there should also be information about the efficiency of the battery shown as a ratio of the total energy output by the system to the total energy input to the system.

Core responsibilities for the EU Battery Passport are making battery data accessible by attributing a unique identifier, updating and storing the information. In this battery lifecycle graph, handling operations and EU Battery Passport responsibilities are summarized:



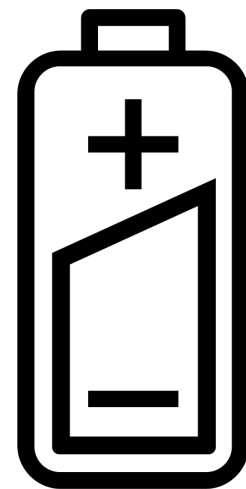
Source: Battery Pass: Simplified Battery Pass Process⁵

How do Digital Product Passports Fit in Your Tech Stack?

Digital Product Passports are enabled by digital supply chain serialization and reporting. The four main capabilities for the EU Battery Passport are:

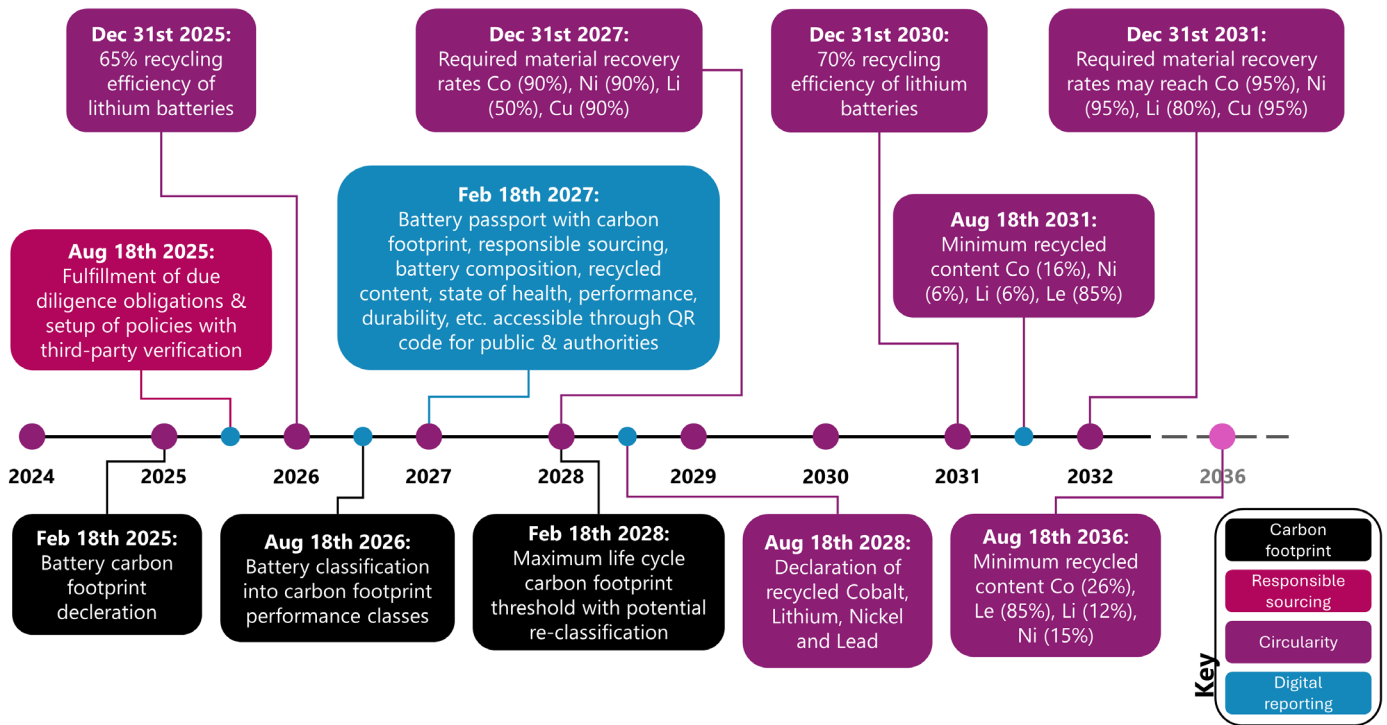
- **Serialization and Identification**
- **Lifecycle Visibility**
- **Process Control**
- **Compliance and Reporting**

Ultimately, the operator must have solutions to acquire data, apply rates and information like carbon estimates, perform any calculations like carbon footprint or energy efficiency, deliver and visualize analytical information and have this information available to be recalled via QR-code. This can be enabled with solutions that integrate with existing ERP tools.



Deadlines for EU Battery Passport Compliance

The EU Battery Passport Directive began enforcement on the 17th of August 2023. The DPP requirement begins with a carbon footprint phase on the 18th of February 2025. Later, phases covering responsible sourcing, circularity and digital reporting come into effect, giving operators time to prepare for regulations and test systems before they are required. Even though deadlines seem far away, the reality is that the complexity and wide-ranging compliance aspects will affect business processes in many ways. This requires a well-advanced planning of the entire compliance project to make sure all business aspects and stakeholders are in alignment. The average project length for implementing such a project ranges between 12-24 months.



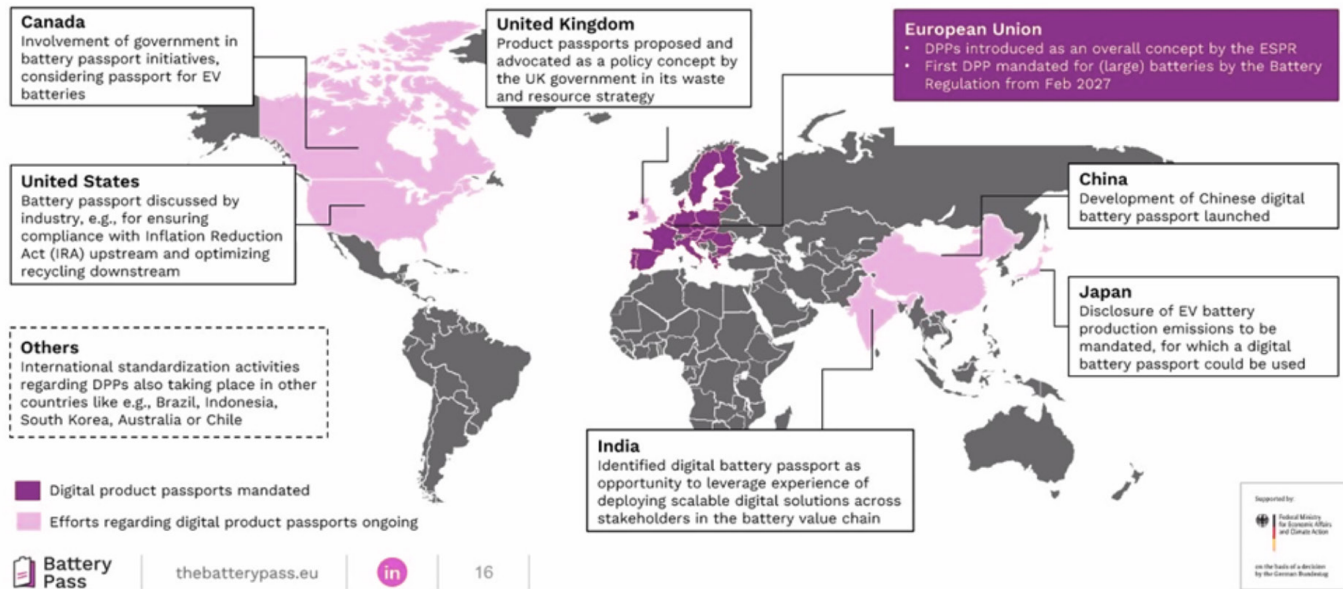
Source: Engineering Industries eXcellence, EU Battery Regulation Timeline

Digital Product Passports Beyond the European Union

It is not only European manufacturers and importers that should be following the requirements of Digital Product Passports. Traceability in the battery value chain is showing up in regulations and discussions in other regions in response to the EU's requirements and due to the value generated by these initiatives. The USA, China, Canada⁶, the OECD⁷ and others have their own initiatives and published information for stakeholders to facilitate trade with the EU or develop their own battery industry supply chains. Global enterprises that prioritize compliance will reap the benefits of increased traceability and quicker uptake of further regulations as sustainability reporting frameworks work towards standardizing due diligence requirements.

The implementation of digital battery passports is essential for achieving sustainable and circular battery value chains. Companies worldwide can look to manufacturers and economic operators within the EU to get an impression of the benefits and reasons to be prepared as major regions around the globe move towards a transparent and sustainable future.

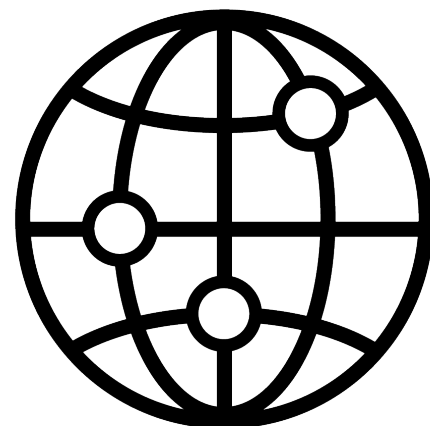
Next to the European Union, similar (regulatory) efforts on the introduction of a digital product / battery passport are ongoing globally



Source: Battery Pass: Ongoing global introduction of a digital product/battery passport

Engineering's Advantage

Engineering Industries eXcellence has broad technical expertise, deep regulatory knowledge across the globe and an innovative solution portfolio that makes us a thought leader in supply chain traceability and compliance. Our experts have strong automotive, battery, energy and software implementation expertise across the Digital Thread and have been delivering traceability projects to organizations worldwide for decades. By connecting the entire supply chain, our Tracking & Tracing solutions provide real-time visibility across global value chains, harmonizing product information from raw material to end-of-life while meeting sustainability goals.



Interested in speaking to one of our experts?

Contact us at indx.com | info@indx.com