InnoEnergy Skills Institute

Energy Storage and the Battery Revolution

Last revised: 2023 March

There is a global imperative to integrate the electricity grid and renewable energy generation and supply. Driving innovation in this space is battery storage which has the potential to revolutionize the way we store energy, and to reshape the playing field for everyone. To keep ahead of change and ensure staying in front of emerging opportunities, it is important to build an industry-standard knowledge and understanding of the battery value chain – from raw materials to recycling.

This certification is a fast-track to insider understanding of battery storage – developments, evolution, applications, and opportunities and provides learners a comprehensive understanding of the battery storage revolution. Specifically, learners receive an overview of the battery storage value chain from raw materials to second life and recycling and insights into developments in battery storage. They get an understanding of different battery storage applications and insights into the market evolution in battery storage, new opportunities, and market dynamics.

Learning outcomes

Upon completion of the certification, learners will be able to:

- Get a big-picture perspective of the battery storage value chain from raw materials to second life and recycling
- Understand different battery storage solutions – potential, applications, and benefits
- Explore business models and market evolution in battery storage
- Get an understanding of new opportunities, market dynamics, and challenges

Certification structure

The certification is delivered fully online and is self-paced, making it easy for participants to learn without having to take time off work.

The certification consists of eight courses and is structured as follows:

Course 1: The Importance of Battery Storage

- Explore different energy storage alternatives, why energy storage is important for our future, and how it can revolutionise the energy sector.

Course 2: Aspects of the Battery Storage Value Chain

- Learn the basics of lithium-ion battery production, from raw materials through manufacturing.

Course 3: Application 1: Electric Vehicles

- Investigate the market of electric vehicles, charging infrastructure, and emerging business models linked to electric vehicles.

Course 4: Application 2: Energy Storage Systems (ESS): Grid / Home

- Understand how using batteries allows for an increase of renewable integration in the grid and brings environmental and financial benefits to customers.

Course 5: Application 3: Industrial Products

- Explore how electrification in underground mining can reduce overall costs, reduce CO2 emissions, and much more.

Course 6: Application 4: Local Energy Systems Based on Storage

- Understand how using batteries allows for an increase of renewable integration in the grid and brings environmental and financial benefits to customers.

Course 7: Investment Scenarios and Business Models for Battery Energy Storage

- Explore new investment scenarios and innovative business models arising in the highly mutable battery energy storage market.

Course 8: Battery Recycling and Second Life

- Learn different models of handling batteries when they are no longer suited to their original purpose, including reuse and recycling.

Instructors

The certification is led by experts from the EIT InnoEnergy ecosystem. Instructors on this certification are:

Iván Contreras

Founder and CEO of Torrot, a manufacturer of electric bicycles and scooters. Iván is specialised in knowledge management, high-speed organisations, and innovative product development.

Victoria Flexer

Researcher at CONICET and Professor at the National University of Jujuy. She has a Ph.D. in Chemical Sciences and her work ranges from sustainable mining techniques to the development of state-of-the-art batteries

Julian Jansen

Research and Analysis Manager at IHS Markit Technology, leading the global research on energy storage and provides insight into the value drivers and emerging business models driving storage deployment across Europe and N. America.

Björn Jernström

CTO of Ferroamp and inventor of four different patents related to ACE technology that enables savings on grid fees and faster EV charging. He has previously founded two successful startups in the electric power industry.

Oliver Koch

Managing Director and COO of sonnen, with overseas operations for the company such as worldwide procurement and manufacturing.

Yann Laot

VP Strategy, Sales & MarketingVP Strategy, Sales & Marketing ACC - Automotive Cells Company and former Director of Services, Support, and Solutions for Energy Storage Solutions at SAFT. Specialties are Li-ion topics, i.e. markets, products, technologies, manufacturing, and competitive landscape analysis.

Fernanda Margarido

Associate Professor with Habilitation at IST/UL, on the scientific area of Environment and Energy of the Department of Mechanical Engineering, President of the Scientific Council and researcher at the Center for Innovation, Technology and Policy Research (IN+), and coordinator of the Waste Processing and Management Laboratory, leading a research group on Materials Recycling of Wastes and End-of-Life Products.

Carlos Nogueira

Senior Researcher at Laboratório Nacional de Energia e Geologia with a PhD in Materials Engineering and degree in Chemical engineering, as well as numerous research projects within the area of batteries and recycling processes.

Bo Normark

Industrial Strategy Executive and former Thematic Leader for Smart Grids and Energy Storage at EIT InnoEnergy. He has more than 35 years of industrial experience in ABB in development, design, project management, and global management of the Power Systems business.

Erik Svedlund

The Global Marketing Manager – Electrification at Epiroc. He held several positions over the years, at Atlas Copco. Erik is an innovative and visionary leader committed to electrifying the mining world.

Jan Verveckken

Worked in the quality control department of Audi Brussels. He recently was working under EBA Academy at EIT InnoEnergy. Currently, a professor of electrochemical engineering, energy transition and power at the Rotterdam University of Applied Sciences

How will you learn?

This is an online certification and can be taken at your usual study location. The certification consists of eight courses and is self-paced.

Duration: 13 Hours

Is it right for you?

This certification is beneficial for learners working in energy technology, renewable energy, engineering, and consultancy. But anyone interested in developing their knowledge of battery storage and enhancing their professional development will find it useful.

Prerequisites: General understanding of the energy and electricity system.

Certificates of Achievement

We offer two pathways for issuing of certificates, **InnoEnergy Skills Institute Certificate** and **EDC (European Digital Credentials),** each with its own unique set of benefits, allowing your organization to choose the one that best suits the objectives. **The Achievement recognition will be awarded at a >75% course assessment pass rate.**

InnoEnergy Skills Institute Certificates

What is it?

The InnoEnergy Skills Institute serves as the certificate issuer, verifying learners' progress and achievements with the course material.

What are the benefits?

InnoEnergy Skills Institute certificates are highly adaptable for recognizing various learning levels and achievements. We offer Participation, Completion, and Achievement certificates for learners who complete online courses through the Skills Institute platform.

What that means for you?

You will receive a digital credential that you can store in your personal digital credential wallet. You can also add and share these credentials on your social media platforms. The authenticity of the credentials can be verified online by anyone seeking credential verification.

European Digital Credentials (europass)

What is it?

European Digital Credentials provide an online record of an individual's personal achievements and qualifications. Recognized by employers across continent, InnoEnergy Skills Institute can issue European Digital Credentials, which learners can add to their European Digital Credentials wallet. For this type of credentials, we only offer Achievement certificates, awarded at a >75% course assessment pass rate.

What are the benefits?

It allows learners to signal their skills and qualifications using the European Learning Model — a semantic standard that helps the recognition of qualifications and digital credentials across Europe. It also combats fraud, and greatly reduces administrative costs.

What that means for you?

You can be confident in the authenticity of your credentials and showcase your skills in a way that is understood in the context of the European Learning Model. You'll also be able to access everything quickly and easily via your online European Digital Credentials wallet.

Versioning

#	Version	Summary of Changes	Date
1	v1.1	Updated the formatting as per InnoEnergy Colour and Font styles	09-Dec-24