InnoEnergy Skills Institute

Solid State Batteries

Last revised: 2023 March

As the industry is pursuing ever-higher energy density, faster charging and lower cost, the current Li-ion technology platform based on liquid electrolytes faces is soon approaching the technical limits. A switch to solid-state electrolytes is on the horizon and is already now the subject of large research efforts.

This certification gives a high-level overview of the imminent switch to solid electrolytes in the battery industry and provides insight into the impact this will have on the industry. It provides you with information on the next-generation electrolytes for Li-ion and Lithium metal batteries, the solid electrolytes. You will understand why the shift to a solid electrolyte is necessary, which types of solid electrolytes exist, how they work, and their specific features and benefits. Lastly, you will understand how the electrolyte plays a key role in cell architecture, electrode manufacturing, and cell assembly.

Learning outcomes

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

- Give the basic build-up of Li-ion and lithium batteries and assign the relevant components with their purpose
- List the main requirements for solid-state electrolytes
- Compare ionic conductivity mechanisms through ceramics, polymer, and composite electrolytes
- Give the challenges involved with integrating a solid-state electrolyte in a battery cell
- Compare the thin-film battery technology against the classical Li-ion battery technology

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 one course and is structured as follows:

Course 1: Introduction to Solid-State Batteries

- Explore the fundamentals behind solid-state batteries to understand the potential and challenges behind these cutting–edge technologies.

Instructors

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

Maarten Mees

R&D team leader in Electrochemical Storage at IMEC. Maarten has completed research and research education in physics at KU Leuven while having master level studies in Electrical Engineering also at KU Leuven. Maarten is focused on developing the next generation of solid-state batteries, with an interest in ALD technology and the development of novel nanomaterials for the cause.

How will you learn?

This is an online certification and can be taken at your usual study location. The certification consists of one course and is self-paced.
Duration: 2 Hours

Is it right for you?

The course in this certification is beneficial for chemical engineers, process engineers, battery and R&D professionals looking into next-generation battery technology. Also, anyone interested in understanding solid-state battery technology might find it useful.

Prerequisites: In order to be able to follow and benefit from the solid-state batteries' certification, learners would need to be acquainted on a high level with the working principle of batteries and lithium-ion batteries in general.

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 the 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