

InnoEnergy Skills Institute

Energy Systems Integration: the Future of Transport

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Available in: English

The transportation sector is at a crossroads. As one of the biggest consumers of the world's energy and a major contributor to CO2 emissions and air pollution, the onus is on the transport sector to find alternative energy solutions to drive a sustainable future for all.

In this certification, you will learn about the electrification of the transportation system and how this development affects the overall energy system. You will hear crucial insights about business models and regulations impacting electric vehicles. Finally, you'll explore the needs of an urban transport system, including charging infrastructure.

Learning outcomes

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

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- Explain how the history of electric transport is reflected in today's industry
 - Differentiate different car propulsion technologies, from combustion engines to hybrid vehicles and fully electric cars
 - Describe the impact of electromobility on the energy system
 - Explain how current business models and regulations impact the design of electric charging systems
 - List multiple forms of electric transport and their impact on the energy system
 - Describe challenges and solutions on the path to transport electrification at scale
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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 lessons and is structured as follows:

Lesson 1: History of Electric Transportation: From Edison to Tesla

- Get introduced to the concept of electrification of the transportation system, through a short history of the electric vehicle, technological breakthroughs that have led to the revival of electric transportation, and challenges that still need to be addressed.

Lesson 2: Electrical Drives in Transportation: An Overview of Technologies

- Learn how to recognise the difference between a battery electric vehicle and a traditional gas-fueled car, and about the most common types of hybrid electric vehicles.

Lesson 3: How Does the Integration of Electromobility Affect the Energy System?

- Review the different primary sources of energy used to generate electricity and understand how the extra electricity used for transportation affects the electricity grid on different scales

Lesson 4: Business Models and Regulation Behind Charging Stations

- Learn how electromobility is integrated within the larger energy system considering the charging infrastructure, return on investment, as well as relevant taxes and fees.

Lesson 5: Integrating Other Forms of Electric Transportation into the Energy System

- Explore several other modes of electric transportation such as public transportation, electric ships and planes, and more.

Lesson 6: The Path Towards Large-Scale Electric Vehicle Use

- Explore some of the important challenges for electromobility and its future.

Case study 1: How to Roll Out a Reliable Network of Fast Chargers

- Learn about several technologies developed by ABB that assist with the integration of electromobility in today's energy system and explore different approaches to rolling out fast-charging networks.

Case study 2: Urban Transformation: The Impact of Electrifying Public Transport

- Get introduced to electric public transport, looking into three different technologies used for electrifying public transport: overhead lines, inductive charging, and conductive charging.

Instructors

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

Johan Driesen



Full professor at the Faculty of Engineering and Science head of Subdivisie EnergyVille Electa, Driesen with years of experience in distributed generation of electricity, renewable energy, power electronics, electrical drives, electric vehicles, and smart grids.

Peter Van Den Heede

Head of Sales Council – Electrification Benelux at ABB, working at ABB for more than 10 years in the fields of smart grids, electrification, and business development.

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: 6 Hours

Is it right for you?

This certification is beneficial for learners involved in the energy industry, and for academics and individuals who want to deepen their understanding of energy systems integration and developments in this exciting and important field.

Prerequisites: Basic understanding of the 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 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.