



Energy Systems Integration: the future of transport

Structure and FAQ



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1.1. Course description

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.

This course gives learners a big-picture understanding of the history, the changing present, and the future for electromobility which is and is set to remain one of the most compelling, globally relevant, and innovative areas in our global economy that is being shaped by the energy transition. Learners will also explore compelling case studies to understand how tech giant ABB has been changing the playing field, driving innovation in high-end electromobility for cars and public transport.

1.2. Learning outcomes

This course empowers learners to:

- Differentiate different car propulsion technologies, from combustion engines to hybrid vehicles and fully electric cars
- Formulate the different challenges to large-scale deployment of electro-mobility
- Fully understand the impact of electromobility on the electricity grid
- Master different business models for electric vehicle charging
- Appreciate different modes of electric transportation and their respective challenges for further electrification.

1.3. Course structure and content

Energy Systems Integration: the future of transport is a fully online course that consists of eight self-paced online lessons which are as follows:

- **Lesson 1:** History of electric transportation: from Edison to the new Tesla
- **Lesson 2:** Electrical drives in transportation: overview of technologies
- **Lesson 3:** How does the integration of electromobility affect the energy system?
- **Lesson 4:** Business models and regulations behind charging stations
- **Lesson 5:** Integrating other forms of electric transportation into the energy system
- **Lesson 6:** The path towards large-scale electric vehicle use
- **Case study 1:** How to roll out a reliable network of fast chargers?
- **Case study 2:** Urban transformation: the impact of electrifying public transport

1.4. Who are the experts in the course?

This course was developed in collaboration with experts from the EIT InnoEnergy ecosystem, authorities in sustainable energy from the worlds of research and industry. Faculty for this course 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.

1.5. Target audience

The course is ideal for professionals in the energy industry. It is also expertly designed for academics and individuals who want to deepen their understanding of electromobility, challenges, innovations, and future scenarios in this exciting, fast-moving space.

1.6. What qualifications does a learner need to join to the Energy Systems Integration: the future of transport course?

There are no prerequisites in order to be able to follow and benefit from the Energy Systems Integration: the future of transport course. It is recommended to take Energy Systems Integration: an introduction, before taking this course, although this is not mandatory.

1.7. What is the expected time investment by each learner?

The required time investment is around 2 hours/week on average. Below appears a suggested timeline (*Figure 1*).

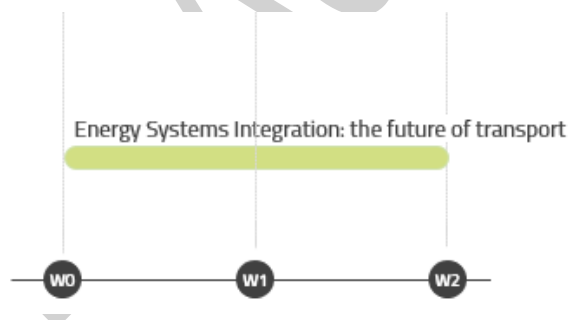


Figure 1: Suggested timeline for the Energy Systems Integration: the future of transport course

1.8. Interaction with the course leader

It is recommended that this online course has a dedicated course leader (topic specialist). The course leader shall optionally be available for a (suggested) total of one hour throughout the course run to answer asynchronous questions via the learning platform or other means. This is recommended to take place in a forum where all learners have access and can benefit from the answers or any discussion.

The course leader's profile is expected as follows: Experience in electric drives and electromobility in general. Additionally, important to have an up-to-date overview of the electric vehicle market.

1.9. Course evaluation

To succeed in the Energy Systems Integration: the future of transport course and receive a Certificate of Completion, a learner needs to complete at least 80% of the course contents.

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