Successful online learning for sustainable last mile logistics

CHAPTER 3: Trends for more effective Last Mile Distribution

UNIT 3.4: Improving logistics' effectiveness & impact

Capsule 3.4.5

Switching to new energy models

Co-funded by the Erasmus+ Programme of the European Union

To be done prior to this capsule:	Capsule 2.1.2, 2.1.3
Capsule linked with:	Capsule 2.3.4, 2.4.1, 2.4.2, 2.4.5, 2.5.1, 2.5.2, 3.4.4, 3.4.7
Authors:	NVF & SUSMILE Consortium

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Objectives of the Capsule

One of the solutions to reduce the environmental impact of last mile distribution (LMD) is the switch from internal combustion engines to new energy sources. This capsule will provide an introduction to the topic and examples of the switch and its application in LMD.
The objective of the capsule is to help learners understand what is an energy model, why there is a need to change it and how the transition is/will be applied in LMD.

Category	Document, source	EQF		
		4	5	6
			X	X

Exercises included	YES

Effort for the capsule	Content 5 Min.	Exercises 5 Min.	Extra material 25 Min.

Contents

Instructions for the Capsule

You will find attached to this Capsule three primary sources of information:

1. The first source is a web site article that describes the energy challenge that the world faces, and argues for a need to switch to a new energy model.

2. The second source, web site article, writes about possible ways how electric mobility could change logistics and last mile delivery sector.

Instructions for the Capsule

3. The third article of this capsule argues that electric vehicles are the future of last mile delivery. Do not forget, however, that there are also some other options than electric vehicles as is mentioned at the end of the capsule.

4. The last article is used within an exercise at the end of the capsule. It offers a brief example of switching on electric vehicles in a logistic company.

By reading through those sources you should get a basic overview of some challenges connected to the issue of energy sources. Also you will see the advantages and disadvantages of electric vehicles if they would be used in last mile delivery sector. Besides that, the following pages of the capsule bring a brief summarization of the source‘s content most relevant to the topic.

Introduction to the concept of energy models: why we need to switch them

Our world experienced three great industrial revolutions that transformed the world over the last 250 years. They were powered by a variety of energy sources: coal, oil, and then nuclear power.

Now we face a dilemma: with depletion of fossil fuels and in the increase in energy demand the world needs new sources of energy. Moreover, those sources have to be ecological to stop global warming.

Introduction to the concept of energy models: why we need to switch them

Our chance is to implement an energy transition that both satisfies increasing energy demand and prevents continuous irreversible damage to the environment. Those sources are wind, solar photovoltaic and thermosolar, and also traditional energy sources, such as hydraulic and biomass energy**.**

Source (web site in EN): de la Plaza, I. M. (2021, April 12). *The Energy Challenge: the Transition to a New Energy Model.* https://www.bbvaopenmind.com/en/science/environment/the-energy-challenge-thetransition-to-a-new-energy-model/

Video (in EN): *The Energy Challenge: the Transition to a New Energy Model* https://youtu.be/yT784fbS_Wg

Specific application in logistics: transition to electric mobility

Logistic and LMD sector will be significantly touched by energy transition. One of the most obvious changes can be switching on electric mobility.

There are some negatives and positives of combustion engine vehicles and electric vehicles as you can see in the table on the next list.

Specific application in logistics: transition to electric mobility

Parameters	Internal Combustion Engine Vehicle (ICE)	Electric Vehicle (EV)
Cost of Ownership	*Low*	*High*
Eco friendly	*Air and noise pollution*	*No pollution*
Fuel cost	*Hike in petrol prices*	*Battery replacement cost*
Maintenance cost	*High*	*Low*
Last mile logistics	*Expensive*	*Cost effective*
Technology advancements	*Difficult*	*Effectively implemented*

Source (web site in EN): esmito.com. (2021, September 3). *Electric mobility disrupting the logistics and last mile delivery industry.* *https://esmito.com/blog/electric-mobilitydisrupting-logistics.html*

Source (web site in EN): Sarma. S. (2021, February 9). *Electric Vehicles (EVs) — The Future of Last-Mile Deliveries in 2021 and Beyond.* *https://blog.locus.sh/electricvehicles-for-last-mile-deliveries/*

Specific application in logistics: transition to electric mobility

However, electric vehicles powered by rechargeable batteries are not the only possible solution. Other promising technologies that could help in the transition to non-fossil fuel energetic model are being developed.

Hydrogen energy, to name one, is already in use in the case of public transportation or garbage trucks. Some hybrid electric vehicles use fuel cells to charge the battery. The fuel cells use hydrogen and oxygen to generate electricity by an electro-chemical process producing only water as a by-product.

Specific application in logistics: transition to electric mobility

So as you see, those hybrid vehicles on hydrogen use electric energy to move, but the source of energy is different from standard electric vehicles. While the former use hydrogen to generate electricity, the latter use electricity produced by power stations for charging its car batteries.

In future we will see what concept will win. So far, however, hydrogen vehicles are not prepared for mass production and use.

As a use case of using of hydrogen garbage truck you can see the video below:

Video (in EN): https://youtu.be/9BYqjHLEhV0

Document, Source 1

de la Plaza, I. M. (2021, April 12). *The Energy Challenge: the Transition to a New Energy Model.* https://www.bbvaopenmind.com/en/science/environment/the-energy-challenge-the-transition-to-a-new-energy-model/

Document, Source 2

Esmito.com. (2021, September 3). *Electric mobility disrupting the logistics and last mile delivery industry.* https://esmito.com/blog/electric-mobility-disrupting-logistics.html

Document, Source 3

Sarma. S. (2021, February 9). *Electric Vehicles (EVs) — The Future of Last-Mile Deliveries in 2021 and Beyond.* https://blog.locus.sh/electric-vehicles-for-last-mile-deliveries/

Document, Source 4

DHL. (2021, September 6). *DHL supply chain adds a new Volvo electric truck to its fleet.* https://www.dhl.com/cz-en/home/press/press-archive/2021/dhl-supply-chain-adds-a-new-volvo-electric-truck-to-its-fleet.html

Exercise: Open questions

Based on what you have learnt in this capsule, please try to answer the following questions in your own words.

- Why we should switch to new energy models?
- In what way the LMD sector can be affected by the energy transition?
- What are the main pros and cons of vehicles with the combustion engine and electric vehicles?
- Are there some ecological alternatives of electric vehicles available?

Exercise: Practicing

Read through a short article about adding electric vehicles to the DHL delivery fleet and identify:

- Main motivation of DHL for switching on electric vehicles.
- Main obstacle the company faces in using electric vehicles.

Source (web site in EN): DHL. (2021, September 6). *DHL supply chain adds a new Volvo electric truck to its fleet.* https://www.dhl.com/cz-en/home/press/press-archive/2021/dhl-supply-chain-adds-a-new-volvo-electric-truck-to-its-fleet.html