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**BUSINESS SOLUTIONS FOR LOGISTICS DECARBONISATION**

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In spite of the fact that the society is greatly concerned about ecological problems and the consequences of the industrial progress, few people ever think about the connection of such spheres as logistics, marketing and ecology. In the context of logistics, the prime concern tends to be pollution, or the impact of vehicle emissions into the atmosphere. Vehicle emissions generally relate to burning fossil fuels and the gaseous and particulate emissions from the engines, for example CO<sub>2</sub>.

Freight and logistics are considered a growing contributor to global climate change. According to the International Transport Forum (ITF), freight transport accounts for about 39 % of transport CO<sub>2</sub> emissions and around 8 % of CO<sub>2</sub> emissions worldwide. It's also a major contributor to air pollution. Road constitutes 62 % of emissions, while sea contributes 27 %, air 6 %, rail 3 % and inland waterways 2 %. In Europe, freight constitutes 6 % of total CO<sub>2</sub> emissions and 30 % of transport CO<sub>2</sub> emissions [1].

That is why more and more governments, associations and businesses are taking the responsibility for the consequences of the climate change triggered by CO<sub>2</sub> emissions. The goal is that Europe could be the first climate-neutral continent in the world by 2050, according to the Paris Agreement [2].

Logistics companies are now looking for ways to reduce negative emissions. But when it comes to freight transport and logistics, they face challenges. Freight emissions are still increasing, in contrast to most other sectors. Global transport demand is estimated to triple by 2050, which would mean doubling carbon emissions under a business as general scenario [3].

We want to point out that these challenges can be reached by some steps in four solution areas. They are marketing, management, logistics and ecology.

Solutions to manage freight transport demand growth are described in the table below. Several different solutions are included that may impact freight-transport demand but that also consider factors such as the welfare of service operators and users and access to goods and services.

Table 1 – Business solutions for logistics decarbonization

Area	Solutions	Description
Logistics	Supply chain restructuring	Redesign of a logistics network's nodal points, distribution hierarchy and inter-related transport flows to minimize distances travelled and optimize load factors
	Localization and nearshoring	Localizing production close to consumption where feasible, such as agriculture produce, and nearshoring of inbound materials closer to manufacturing
	Load optimization	Optimize the loading of vehicles taking the vehicle and freight dimensions into account, which can be enhanced using software. Improvements of the load factor of the vehicle through physical techniques such as efficient unit loads, and a combination of a mechanical and manual loading may be necessary
Marketing	Consumer (customer) behaviour	Influencing consumer behaviour through awareness-raising and education on their purchasing habits and encouraging re-use, refurbishment, remanufacturing and recycling. Whether last-mile home delivery reduces carbon emissions depends on how this service is delivered and if it replaces a consumer shopping journey with a motorized vehicle that generates more emissions. It needs to consider lead time and delivery time and move in the opposite direction of the "one hour" and "same day" delivery
Management	Decentralization of production and stockholding	Moving production stockholding and sales closer to consumers. As an example, we can see many retailers that are expanding their inventory management to include stores
	Multi-modal optimization	Optimizing the combination and complementarity of different modes and linkages between types of transport by adding, providing better access to, and optimizing transshipment possibilities. An example is the use of high-capacity road freight transport vehicles, including the European Modular System, in the first and last road legs of combined and multimodal transport operations which could reduce the number of vehicles used by one-third

Ecological	3-D printing	3-D printing of spare parts, selected products or parts of products that can be combined with manufacturing closer to markets, while acknowledging that raw materials still need to be transported
	Dematerialization	Reducing the physical quantity of goods, products and packaging needed to deliver consumer value. Possibilities are product re-design, waste minimization, recycling, digitization, miniaturization, material substitution, and postponement of dispersing products to new markets

Source: own representation based on [4].

All solutions areas need to be further investigated in terms of challenges and opportunities and should be considered when designing a decarbonization strategy. To achieve emissions reduction goals for freight transport and logistics, many innovations have to be made. The necessary new technologies, organizations and business models must be identified, designed, tested and applied successfully together. If the specific target of zero emissions is to be achieved by a certain year, the efforts of different stakeholders, including companies, government, research and development institutes and civil society, need to be balanced. The process to achieve this balance is not straightforward, nor is its management. But it is absolutely possible if these four stakeholders unite and take action.

### References:

1. EC-DC R&I (Final Report of the High-Level Panel of the European Decarbonisation Pathways Initiative 2018) [Electronic resource]. – Mode of access: [https://ec.europa.eu/info/sites/default/files/research\\_and\\_innovation/research\\_by\\_area/documents/ec\\_rtd\\_decarbonisation-report\\_112018.pdf](https://ec.europa.eu/info/sites/default/files/research_and_innovation/research_by_area/documents/ec_rtd_decarbonisation-report_112018.pdf). – Date of access: 20.10.2022.
2. European Commission – EU Action (2050 long-term strategy) [Electronic resource]. – Mode of access: [https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2050-long-term-strategy\\_en](https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2050-long-term-strategy_en). – Date of access: 20.10.2022.
3. OECDiLibrary (ITF Transport Outlook 2021) [Electronic resource]. – Mode of access: [https://www.oecd-ilibrary.org/transport/itf-transport-outlook-2021\\_16826a30-en](https://www.oecd-ilibrary.org/transport/itf-transport-outlook-2021_16826a30-en). – Date of access: 20.10.2022.
4. ETP-Alice (Roadmap towards Zero Emissions Logistics 2050) [Electronic resource]. – Mode of access: <https://www.etp-logistics.eu/wp-content/uploads/2019/12/Alice-Zero-Emissions-Logistics-2050-Roadmap-WEB.pdf>. – Date of access: 20.10.2022.