Energy
National Research Programmes 70 and 71

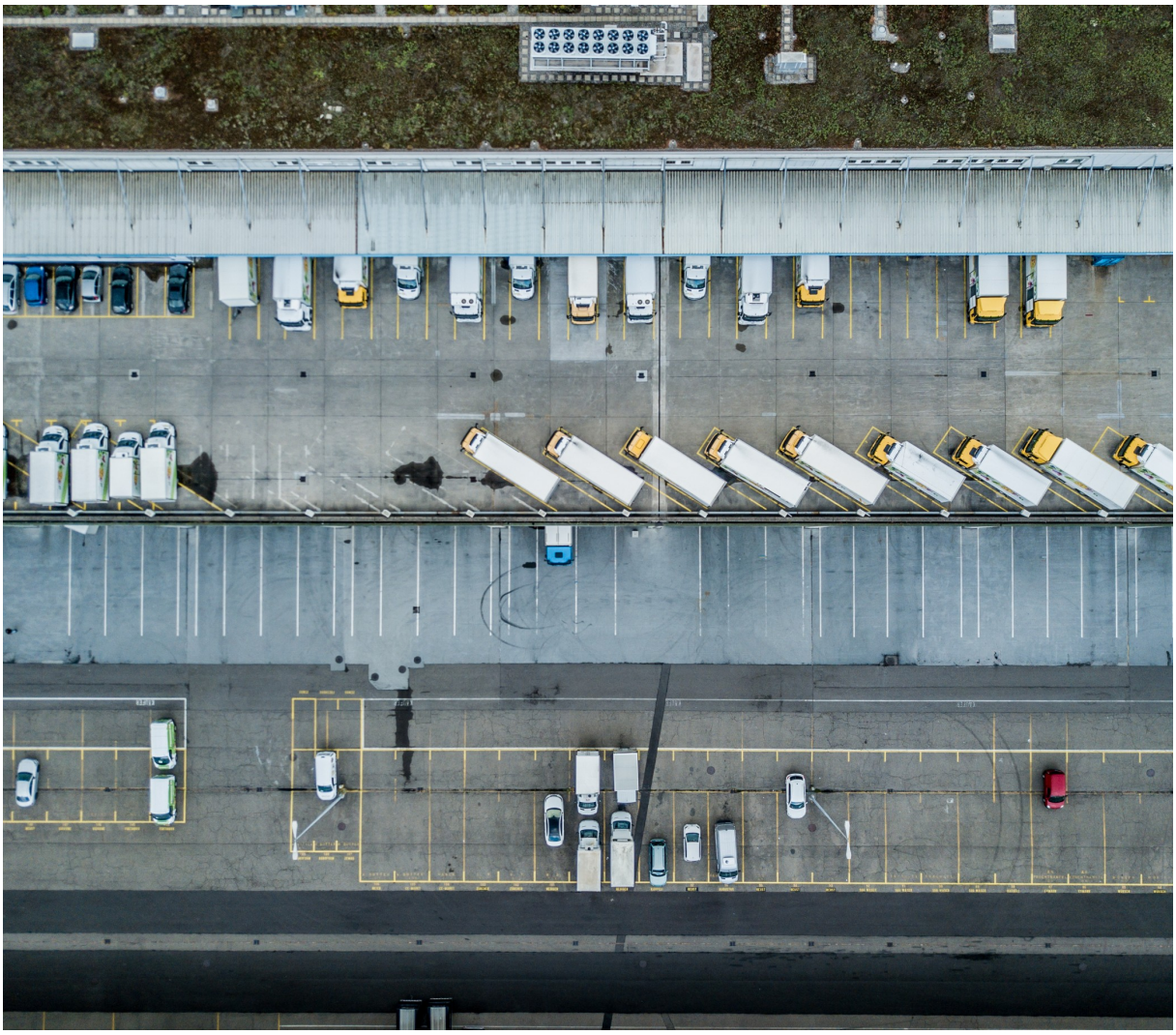
Project

Smart urban freight logistics

An Emission-Free Vision for Urban Freight Transport

An Emission-Free Vision for Urban Freight Transport

Silent, working to capacity, emission-free - such is the vision for urban freight transport. In the logistics industry, vehicles operating at full capacity, efficiently planned routes and new, CO2-free propulsion systems should contribute to the implementation of the Energy Strategy 2050.



In future, a large proportion of urban freight traffic will continue to be handled by road, with trucks and delivery vans distributing goods from logistics centres. *Source:* Shutterstock

At a glance

- The transport sector, including urban delivery services and freight traffic, accounts for approximately 40 % of the energy consumed in Switzerland. There is therefore great potential for energy savings in this area.
- Researchers have developed a vision for a complete ban on CO2 emissions and improved energy efficiency in urban logistics. This vision has the potential to make a significant contribution to the Energy Strategy 2050.
- The scientists conclude that CO2-free freight transport in cities is possible. The greatest potential lies in the areas of propulsion and fuel, mobility pricing, energy efficiency and conditions of use. However, more cooperation between the private sector and the authorities is also required.

How realistic are CO_2-free freight logistics in Swiss cities? Researchers have addressed this question and developed a vision of how the urban logistics and transport sector can become more energy-efficient and thus do without non-renewable fossil fuels. Implementation of the vision would contribute 7 % to the goals of the Energy Strategy 2050, and total greenhouse gas emissions in Switzerland would even decrease by 9 %.

In order to figure out how the vision of energy-efficient and CO_2-free freight transport can be implemented, the researchers began with the year 2050, for which they defined targets or rather a vision: complete absence of greenhouse gas emissions, substantially improved energy efficiency and 100 % renewable energies in the supply chain. These objectives were then compared with the current trend, i.e. the situation in 2050 in the absence of behavioural changes. In this ‘business-as-usual’ scenario, Switzerland's urban logistics would emit 2.48 million tonnes of CO_2 and present a continuous energy consumption of 122 watts per person, which is six times more that the objective of 20 watts. After defining the targets and quantifying the shortcomings, the scientists were able to search for ways to reduce greenhouse gas emissions.

Improved natural resource management or liberalisation?

In a first step, the researchers listed all factors influencing the energy consumption of urban logistics, such as governmental regulations, spatial distribution of demand, cooperation between companies or new transport technologies They then determined the potential evolution of each factor.

The scientists then integrated all possible development paths in a computer model that produced two scenarios. In scenario A, natural resources are better protected. Scenario B, on the other hand, is dominated by liberalisation and technical development.

In both scenarios, energy consumption and CO_2 emissions decrease significantly: in scenario A, almost 61 % less CO_2 is emitted by urban freight traffic, compared to 56 % less in scenario B. Impressive figures, but not sufficient for an emission-free transport economy. So, what is necessary to achieve zero emissions?

A more judicious use of technologies, regulations, behavioural changes

Based on these scenarios, the researchers then determined which innovations and changes are required to further reduce energy consumption. By doing so, they aim to demonstrate that their zero-emission vision is feasible without unrealistic assumptions regarding massive governmental regulations or ground-breaking new technologies that have yet to be developed.

However, the scientists expect zero-emission, lightweight and fully automated transportation systems to be available by 2050. This will be achieved both technically, through the use of fuel cells and batteries, and organisationally, through automation, improved route selection, avoidance of peak hours and better traffic fluidity. Automated freight trains and ground-based transport robots for the last mile are central elements of this strategy. Underground transport systems also play an important role.

The new technical means also open up completely new business models, such as the local production of goods using 3D printers, which considerably shortens transport routes.

In addition, the researchers are counting on new legal framework conditions that will increase the attractiveness of efficient and energy-saving transport systems. For example, lorries in cities are to be limited by an auction system, and the use of road infrastructures is to be regulated by mobility pricing, which also favours CO_2-free vehicles. In addition, a mandatory declaration of the energy consumption of products, both in terms of production and transport, should be introduced. This ought to encourage customers to favour less energy-intensive products. The introduction of limited road capacity should encourage transport companies to cooperate in order to optimise the use of their vehicles and thus further contribute to energy efficiency.

The investigators also believe that consumer behaviour will change. Acquisition will give way to sharing: objects will be borrowed as needed, and in this way be used more often. This sharing economy will become simpler as digitalisation progresses and, above all, “quite the thing to do”. In addition, products will once again become more durable and easier to fix. All these elements lead to less transport traffic, higher efficiency and therefore improved environmental friendliness.

However, these changes, some of which are far-reaching, will not simply happen on their own. The scientists emphasize that it is important to strengthen cooperation between companies on the one hand, and between companies and authorities on the other. This will allow for greener, more efficient and qualitatively improved freight logistics and waste management in urban areas.

Produkte aus diesem Projekt

- Stadtlogistik: Mehr Güter, 90 Prozent weniger Energie und gänzlich CO2 frei
  Date of publication: 01.01.18
- Logistique urbaine: Plus de marchandises, beaucoup moins d'énergie et sans CO2
  Date of publication: 01.01.18
- Stadtlogistik: mehr Güter, weniger Energie
  Date of publication: 01.01.18
- Plus de marchandises, moins d'energie
  Date of publication: 01.01.18
- Stadtlogistik: Mehr Güter, weniger Energie
  Date of publication: 01.01.18
- Intelligente Mobilität für die Güterversorgung in der Stadt
  Date of publication: 01.01.18
- Energieeffiziente und CO2-freie urbane Logistik – Visionen & Herausforderungen
  Date of publication: 01.01.18
- Logistique urbaine intelligente
  Date of publication: 01.01.18
- Intelligente urbane Logistik
  Date of publication: 01.01.18
- Wie wir die Güter besser verteilen könnten
  Date of publication: 01.01.18
- Smart Urban Freight Logistics
  Date of publication: 01.01.18
- Energieeffiziente und CO2-freie urbane Logistik - Aktionsplan
  Date of publication: 01.01.18
- Trends und Massnahmen in der urbanen Logistik – Ergebnisse einer Online-Befragung
  Date of publication: 01.01.18
- Vision 2050 - Energie effiziente und CO2-freie urbane Logistik
  Date of publication: 01.01.18
- Szenarien 2050 – Die Methodik und die Geschichten dahinter
  Date of publication: 01.01.18
- Wege zu einer effizienteren urbanen Logistik
  Date of publication: 01.01.18
- Weniger Lastwagen-Fahrten: Zwei Konkurrenten spannen zusammen
  Date of publication: 21.02.20

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All information provided on these pages corresponds to the status of knowledge as of 10.05.2019.