

Transport and the environment

Cellulosic Specialties in Örnsköldsvik and Stenungsund

EXECUTIVE SUMMARY



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Abstract

The environmental impacts from the transport to and from Akzo Nobel Surface Chemistry, Cellulosic Specialties in Örnsköldsvik, producing EHEC and MEHEC (former Rheology Additives) have been studied from global and local perspectives.

The global transport of goods to and from Örnsköldsvik caused total emissions of 3700 tonnes of CO₂, 65 tonnes of NO_x, 4.0 tonnes of HC, 35 tonnes of SO₂ and 2.9 tonnes of CO in 2001. At the same time, 51 TJ of fossil energy was used. The emissions of NO_x, CO and SO₂ from the production process at the site in Örnsköldsvik in comparison to the transport are 2 times less in all the emissions mentioned. The amounts of CO₂ emitted from the transport and production processes are quite similar.

From a local perspective, 270 tonnes CO₂, 836 kg NO_x, 197 kg HC, 4 kg SO₂ and 678 kg CO were emitted from the transport within a distance of 15 kilometres from the Örnsköldsvik site. These emissions are insignificant compare to the total emissions in an average Swedish area with the same radius. The journeys of employees to and from work in most cases cause more negative environmental impacts than the local transport of goods.

Introduction

In order to make progress in sustainable development, the information about environmental impacts from transportation of goods and journeys of employees to and from work is absolutely necessary. This is why Cellulosic Specialties in Örnsköldsvik was motivated to gather information about transportation and use it in order to identify the most significant environmental impacts and develop policies and plans for environmental sustainability.

More than 100 different products are manufactured at Cellulosic Specialties in Örnsköldsvik. These products are transported to more than 80 countries by truck, train and ship. Most of the products are first transported to Gothenburg by truck or train, in Gothenburg they are reloaded to trucks or ships, and further transported to Europe and to the rest of the world. The raw materials for the production are delivered from 8 different countries. Consequently, the overall transportation scenario become rather complex.

The total distance covered by transportation of goods to and from Örnsköldsvik was 177 million tonnes*km in 2001: 62% was carried out by ship, 22% by truck and 16% by electrical train. Compare to other long-distance transports, railway often is an environmentally advantageous transport system. Therefore, as part of company's environmental policy, a considerable effort to use environmentally friendly electrical trains instead of trucks for the transportation of products to Gothenburg was made by Cellulosic Specialties during the last years.

Global environmental impact

The total emissions to air from global transport activities at Cellulosic Specialties were 3700 tonnes of CO₂, 65 tonnes of NO_x, 4.0 tonnes of HC, 35 tonnes of SO₂ and 2.9 tonnes of CO in 2001. 51 TJ of fossil energy was used to transport goods.

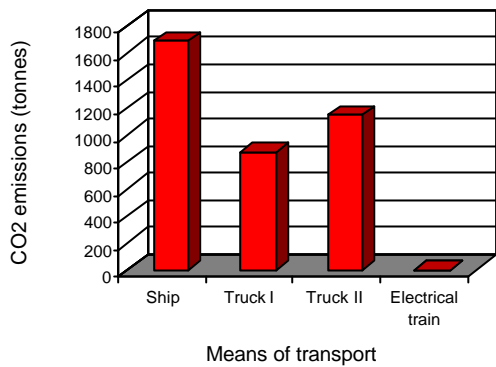


Figure 1. CO₂ emissions from all global transport to and from Cellulosic Specialties in 2001.

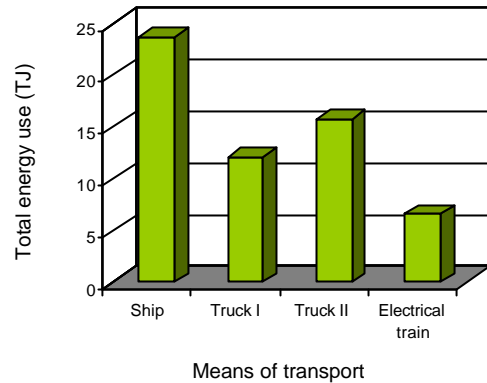


Figure 2. Total energy use for all global transport to and from Cellulosic Specialties in 2001.

From Figures 1 and 2 it is shown that the energy use and carbon dioxide emissions to air are higher for ship and truck transport (truck I and II)¹ than for train. Note that the total distance covered by ship is longer than for other modes of transportation.²

In order to further explain the results of the study, a comparison with the total emissions from the production facilities at Cellulosic Specialties in Örnsköldsvik has been made. It was shown that emissions from the transport are higher than from the production processes except hydrocarbons emissions that are emitted in larger quantities from the production facilities (see Figure 3). The amounts of CO₂ emitted from the transport and production process are quite similar. However, the energy consumption for the production processes is about four times higher than for transportation.

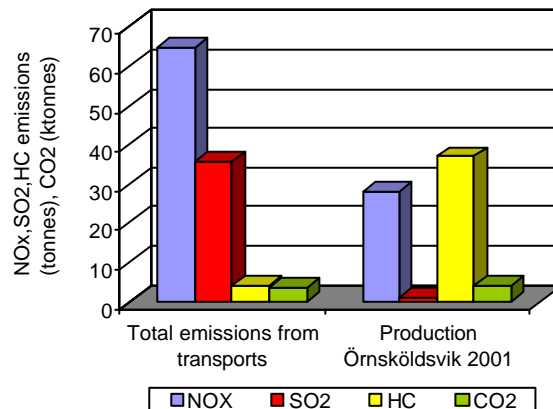


Figure 3. Emissions from all transports in comparison to Örnsköldsvik site emissions in 2001.

¹Truck I: represents average Swedish truck equipped with Euro 3 engine and using MK1 diesel as a fuel. Truck II: represents typical European truck equipped with Euro2 engine and using MK3 diesel fuel.

² 62% of the total distance was carried out by ship, 9% by truck I, 12% by truck II and 16% by electrical train.

In order to minimize emissions and energy consumption, improvements should be made not only in the production processes but also in the transportation sector. Since transportation contributes to higher amounts of emissions compare to the production, it is evident that much more attention should be paid to this sector.

Local environmental impact

The local environmental impact was estimated within a distance of 15 km from the Örensköldsvik site. The environmental impact from the journeys of employees to and from work, impact from the local transport of goods as well as the impact from industrial trucks and other working machines at the production site have been considered.

It was found that during these activities 270 tonnes CO₂, 836 kg NO_x, 197 kg HC, 4 kg SO₂ and 678 kg CO were emitted in the Örensköldsvik area in 2001.

The largest contributor to all types of emissions except NO_x and SO₂ was the journeys of employees to and from work (see Figure 4). This is due to the reason that Örensköldsvik is a small city and the easiest way to get to work is by personal car. From an environmental point of view, this is a very inefficient way of travelling. However, gasoline has a very small content of sulphur and the contribution to the SO₂ emissions is insignificant.

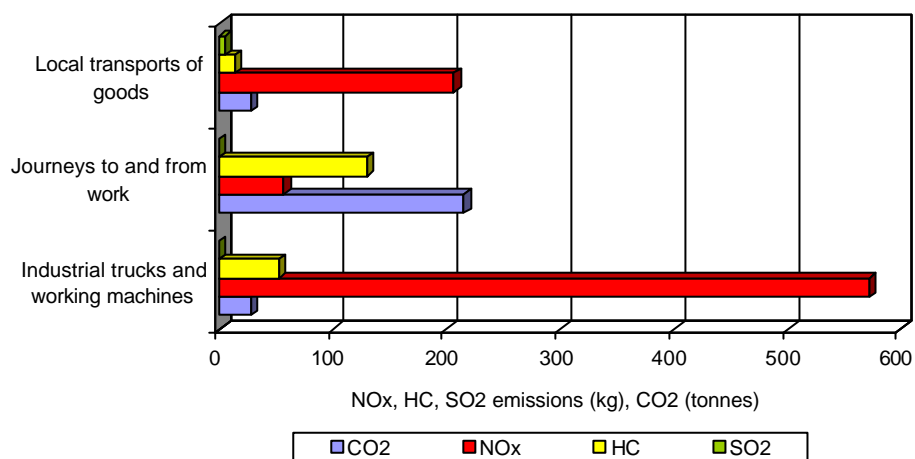


Figure 4. Emissions from local transportation at Cellulosic Specialties in 2001.

The local environmental impact from transportation at Cellulosic Specialties in Örensköldsvik is minor in comparison to other local activities in the area. The impact from the local transportation of goods is from many aspects less significant than the impact from journeys of employees to and from work or the impact from industrial trucks and other working machines used at the site.