



Demonstrate and Assess Tools for Environmental Sustainability

DANTES

Transport and the environment

Cellulosic Specialties in Örnsköldsvik and Stenungsund



Environmental Performance Indicators

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CHALMERS



Introduction

Indicators are measurable aspects of organization, which provide summarized information on how the organization is performing. For example, to assess a financial performance, the indicators such as company turnover, profit, and amount of products sold might be used.

Indicators can also be used to measure environmental impacts. Environmental performance indicators (EPIs) can show clearly how the organization is performing, and provide a firm basis for future targets and improvements. Thus, Cellulosic Specialties at Örnköldsvik, Akzo Nobel Surface Chemistry started to work on developing a set of performance indicators to reflect the progress on sustainable transportation of goods and personnel.




The choice of indicators to describe the most important environmental impacts from transportation is crucial to the quality of the report and its value to stakeholders. Our goal is to provide the readers with a clear and meaningful picture of the organization's environmental performance. To do this, we chose indicators that give a representative picture of environmental conditions, provide a basis for international comparison, and are simple and easy to interpret.

Four indicators were selected for the transportation to and from Cellulosic Specialties at Örnköldsvik:

1. means of transport used;
2. energy consumption by the transport;
3. carbon dioxide emissions;
4. sulfur and nitrogen oxides emissions.

This year we compose the environmental performance report on transportation and present the data from 2001.

EPIs for transportation to and from Cellulosic Specialties

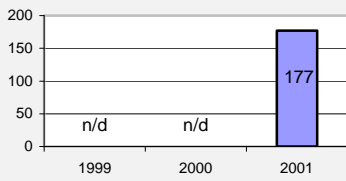
Unit	Objective	Comment
	Means of transport used	
<p>million tonnes*km</p> <p>%</p>	<p>To minimize the number of trips using non-environmental friendly means of transportation</p>	<p>This indicator shows the proportion of trips carried out by train, truck and ship. Compare to other long-distance transports, railway often is an environmentally advantageous transport system. This is true for Sweden where SJ trains run on “green” hydro power electricity.</p> <p>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 from Örnsköldsvik to Gothenburg was made by Cellulosic Specialties during the last years.</p>
	Energy consumption by the transport	
<p>TJ/year</p> <p>MJ/tonne product produced, year</p> <p>MJ/tonne*km, year</p>	<p>To choose environmentally friendly means of transportation and reduce consumption of fossil energy by transport</p>	<p>This indicator also provides information on the greenhouse gas emissions and air pollutant emissions that are directly dependent on energy consumption.</p>
	Emissions of carbon dioxide	
<p>tonnes CO₂/year</p> <p>tonnes CO₂/tonne product produced, year</p> <p>tonnes CO₂/tonne*km, year</p>	<p>To reduce emissions of carbon dioxide to a minimum</p>	<p>This indicator measures the carbon dioxide emissions contributing to global warming.</p>
	Emissions of sulfur and nitrogen oxides	
<p>tonnes SO₂, NO_x/year</p> <p>kg SO₂, NO_x/tonne product produced, year</p> <p>kg SO₂, NO_x/tonne*km, year</p>	<p>To reduce sulfur and nitrogen oxides emissions to a minimum</p>	<p>The indicator measures the sulfur and nitrogen oxides emissions contributing to acidification. Nitrogen oxides emissions also contribute to eutrophication.</p>

Environmental performance in 2001

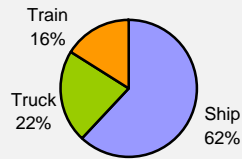


Means of transport used

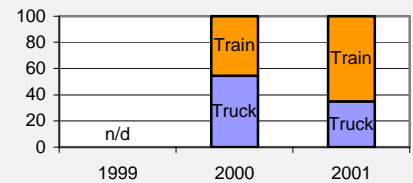
Total distance covered by goods (million tonnes*km)



Total distance covered by goods in 2001, by mean of transport



Transportation of goods from Örnsköldsvik to Göteborg (%)

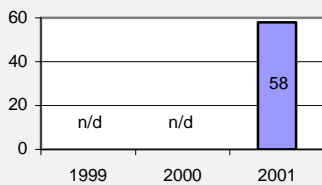


As a result of company's environmental strategy the use of electrical trains between Örnsköldsvik and Göteborg increases from 45% in 2000 to more than 65% in 2001.



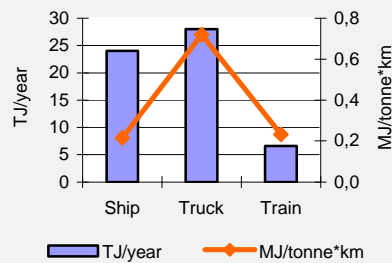
Energy consumption by the transport

Energy use (TJ)



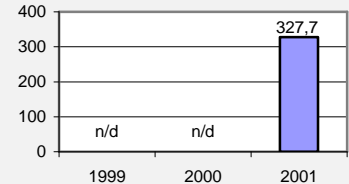
The energy consumption for the production processes at Cellulosic Specialties in Örnsköldsvik is about four times higher than for transportation.

Energy use 2001, by mean of transport

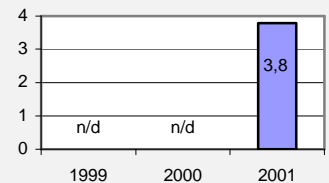


The total energy use (TJ/year) is higher for ship and truck transport than for train. Note that the total distance covered by ship is longer than for other means of transportation. However, the average energy consumption (MJ/tonnes*km) for truck transport is higher than for ship and train.

Energy consumption (MJ) per million tonne*km travelled



Energy consumption (MJ) per tonne product produced

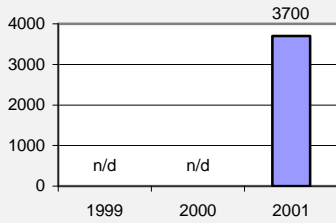


Environmental performance in 2001



Emissions of carbon dioxide

Carbon dioxide emissions (tonnes)



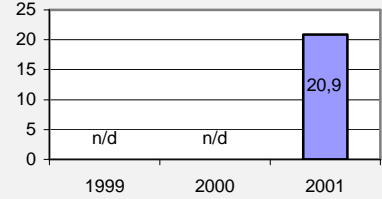
A comparison of carbon dioxide emissions from the transportation with the total emissions from the production facilities at Cellulosic Specialties in Örnsköldsvik shows that the amounts of CO₂ emitted are quite similar.

Carbon dioxide emissions 2001, by mean of transport

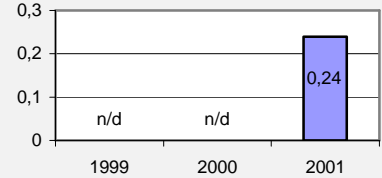


The low CO₂ emissions from the electric trains are due to the use of environmentally friendly hydro power electricity for SJ trains in Sweden.

Carbon dioxide emissions (tonnes) per million tonne*km travelled

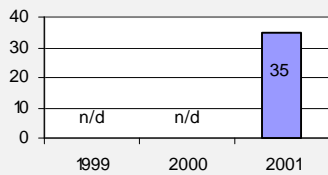


Carbon dioxide emissions (tonnes) per tonne product produced

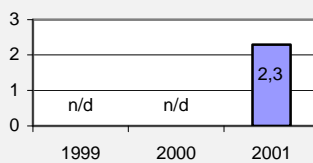


Emissions of sulfur and nitrogen oxides

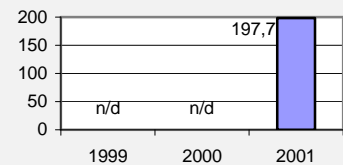
SO₂ emissions (tonnes)



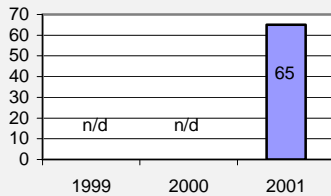
SO₂ emissions (kg) per tonne product produced



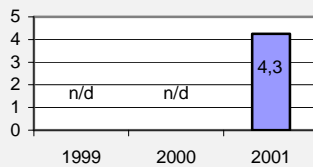
SO₂ emissions (kg) per million tonne*km travelled



NO_x emissions (tonnes)



NO_x emissions (kg) per tonne product produced



NO_x emissions (kg) per million tonne*km travelled

