

SCANIA ENVIRONMENTAL REPORT 1998



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STATEMENT OF THE PRESIDENT AND CEO

It has been an intensive, exciting environmental year for Scania. Several strategic investments that we initiated in recent years have begun to bear fruit.

During 1998, we completed the introduction of the 4-series truck and bus generation in Latin America, giving us a global product range and production system. This means that Scania products are manufactured using the same product specifications and the same environmental standards at all our production units.

Thanks to forward-looking, technologically advanced engine development, today we can already supply our customers with engines that meet European Union (EU) exhaust emission requirements that will apply from the year 2000.

In recognition of our systematic energy-saving efforts over the years, we were awarded the 1998 EKO energy prize in Sweden. We are pleased and proud of this achievement, and we have already met our 1999 goal for reduced energy consumption.

Our effort to implement a certified environmental management system, which began in 1995, is in its final stage. During 1999, we expect Scania's European industrial operations to be certified in accordance with the ISO 14001 international standard. Our Latin American operations have been certified since 1997.

While Scania is improving and expanding its environmental activities, we are continually receiving new signals from our surroundings on the environmental impact of transport work and the vehicle industry. This debate is important, at times intensive and above all complex. It places heavy demands on both our knowledge and our openness to environmental issues.

Our new environmental policy emphasises the importance of continually incorporating environmental aspects into our



day-to-day work and being willing to discuss them with everyone affected by our operations. As part of our environmental strategy, everyone who works at Scania receives environmental training.

I would like to convey my thanks to all Scania employees who, through their knowledge and dedication, have contributed to our successful environmental work. Now let us carry it further.

A handwritten signature in black ink, which appears to read 'Leif Östling'. The signature is written in a cursive, flowing style.

Leif Östling
President and CEO

SCANIA TODAY

Scania is one of the world's leading manufacturers of trucks and buses. It is the fifth largest heavy truck make in the world market. In Europe, Scania is the second largest heavy truck make. In Latin America, Scania has a leading position. Scania is the world's third largest bus make in the heavy segment.

Aside from heavy vehicles, Scania markets service products that may include everything from parts, maintenance and financing to a fixed price per kilometre. During 1998, Scania completed the production changeover to its new generation of trucks and buses, the 4-series. Scania is thus entering the 21st century with a new global product range.

Scania shares are quoted on the Stockholm Stock Exchange and on the New York Stock Exchange.

Scania worldwide

Scania is represented in about 100 countries through 1,000 dealerships with 1,500 service workshops.

There are production facilities in eight countries of Europe and Latin America: Sweden, Denmark, France, the Netherlands, Poland, Brazil, Argentina and Mexico. In addition, there are assembly plants in a number of other countries.

Research and development work is concentrated in Sweden.

At the close of 1998, Scania had 23,500 employees worldwide, of whom 17,000 in production and development facilities and more than 6,000 in the company's own sales and service companies.

Scania's products

Scania manufactures trucks with a gross vehicle weight of more than 16 tonnes (Class 8), designed for long-distance haulage, regional and local distribution of goods as well as construction haulage.

Scania's bus and coach range consists of bus chassis as well as fully built buses for more than 30 passengers, intended for use in urban and intercity traffic or as tourist coaches.

Scania's industrial and marine engines are used, among other things, as power sources in generator sets, earthmoving and agricultural machinery as well as aboard ships and pleasure craft.

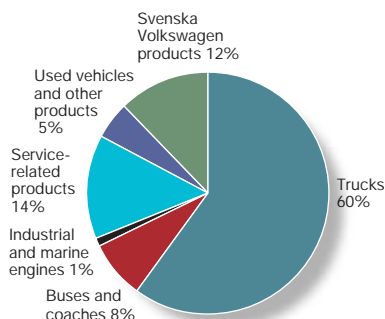
Scania and Volkswagen each own 50 percent of Svenska Volkswagen, which is the Swedish importer of Volkswagen, Audi, Seat, Skoda and Porsche. Scania also owns the Swedish passenger car distributor Din Bil, which accounts for 40 percent of Svenska Volkswagen's deliveries.

Scania's strengths

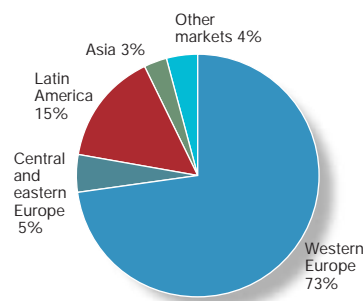
Scania vehicles can be tailored to each customer need. These vehicles have a long service life and low operating costs. Scania's success is based on:

- Its concentration on vehicles designed for customers working with heavy transport of goods and passengers.
- A modular product system and a global production system.
- A service organisation that offers various repair and maintenance packages.
- A focus on growth markets.

Sales by product area, 1998



Sales by market area, 1998 Scania products





Scania's production sites	
Sweden	
Södertälje	Head office, research and development, component and engine manufacture, truck assembly.
Oskarshamn	Cab manufacture.
Katrineholm	Bus and bus chassis development and manufacture.
Luleå	Manufacture of side and cross members as well as rear axle housings.
Sibbhult	Gearbox manufacture.
Falun	Axle manufacture.
The Netherlands	
Zwolle/Meppel	Engine and cab assembly, truck assembly.
France	
Angers	Truck and bus assembly.
Denmark	
Silkeborg	Bus assembly.
Poland	
Slupsk	Truck and bus assembly.
Brazil	
São Paulo	Engine and cab manufacture, truck and bus assembly.
Argentina	
Tucumán	Gearbox and axle manufacture, truck assembly.
Mexico	
San Luis Potosí	Truck assembly.

Scania's ten largest truck markets						
	Heavy truck registrations			Market share in %		
	1998	1997	1996	1998	1997	1996
Great Britain	5,705	5,403	5,591	18.8	20.5	18.6
Brazil	5,268	7,050	5,226	33.4	39.5	38.2
Germany	4,438	3,227	2,990	8.9	7.9	7.7
France	3,635	2,854	3,276	9.4	9.3	9.6
The Netherlands	3,348	2,333	2,878	22.7	20.1	23.1
Spain	2,850	2,050	1,285	16.1	14.9	12.1
Italy	2,252	1,880	2,257	12.5	13.4	15.0
Sweden	1,705	1,429	2,181	46.1	43.0	48.6
Argentina	1,595	1,728	1,509	28.6	34.8	42.0
Belgium	1,356	1,274	1,242	17.8	18.0	20.0

Scania's five largest bus markets						
	Bus registrations			Market share in %		
	1998	1997	1996	1998	1997	1996
Brazil	1,209	1,351	1,369	9.0	10.1	9.1
Spain	372	363	335	15.2	16.8	17.3
Great Britain	323	231	272	12.1	10.4	11.0
Egypt ¹⁾	268	438	-	-	-	-
Sweden	242	262	325	30.3	27.6	38.0

¹⁾ Sales

THE TRANSPORT SECTOR AND THE WORLD AT LARGE

The transport sector is rapidly developing ways to combine growing transport needs with an improved global environment.

Sea, air and land transport services all interact to form an efficient transport system. The demand for transport services is growing, as trade becomes more extensive.

Production, and therefore distribution, increasingly occur after an order arrives directly from the customer. The “just-in-time” concept means that industrial production systems are based on quick, timely deliveries and minimal inventories.

Meanwhile, in all major markets there is an increasing demand for transport services with less environmental impact. The focus will be on improved emission levels, adaptation to alternative fuels and reduced noise levels.

Restructuring in Europe

The need for road haulage is increasing. This trend can be seen clearly in Europe, where the single market is promoting trade and deregulation in the transport industry. Deregulation not only leads to an increase in trade and transport work but also to stiffer competition between companies in the transport business. Profitability in the industry is low and major restructuring is expected. This appears most likely to be achieved by hauliers that offer sophisticated, reliable service employing the “just-in-time” concept and that lower the costs of transport work. Hauliers can also devise logistics concepts in which transport work is only one element of the services they offer customers.

IT streamlines logistics

Information technology (IT) will also have a considerable impact on the transport business. Besides contributing to economic profits, IT can also help make transport work more environmentally sound.

For example, the efficiency of transport work can be improved by using the satellite-guided Global Positioning System (GPS) and mobile data communications. In this way, hauliers can track a vehicle’s position more easily and direct it to a new assignment to avoid driving it empty. This technology can also help select the best route.

The global climate

Worldwide, 1998 was the warmest year in the 20th century. These weather conditions were believed to be related mainly to El Niño, a recurring weather phenomenon that causes major disruptions in global weather patterns.

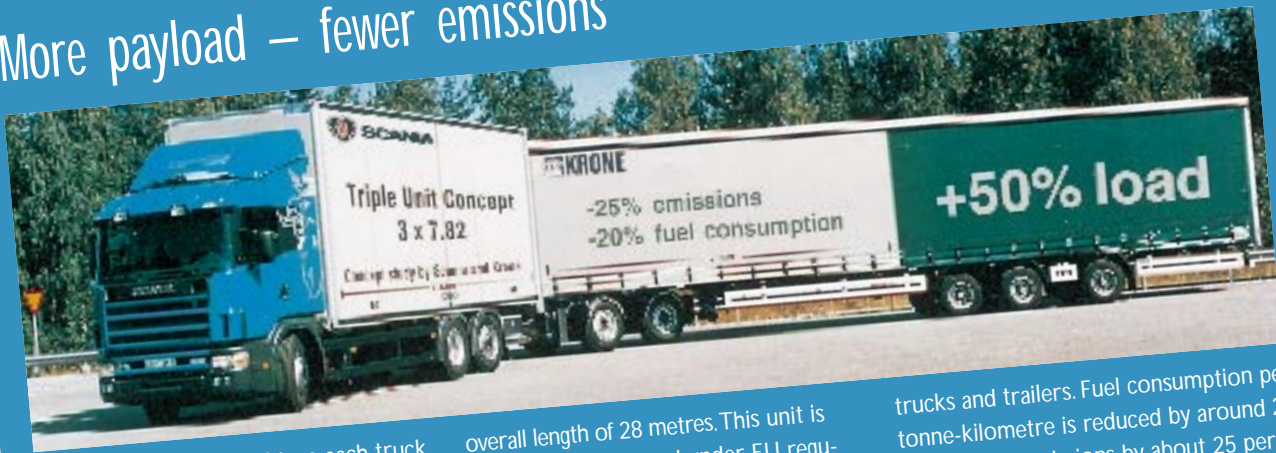
The effects of El Niño intensified people’s concern about the greenhouse effect. Political discussions on the global climate waned after the 1997 UN climate change conference in Kyoto, Japan. The follow-up meeting in Buenos Aires in November 1998 also concluded without any major changes in the negotiating situation.

However, the EU has begun preparatory work on reducing emission levels of carbon dioxide, the gas with the greatest effect on climate, by apportioning emission quotas among its member states. The transport sector accounts for between 20 and 30 percent of carbon dioxide emissions.

An agreement between the European Commission and the car industry on a 25 percent reduction in carbon dioxide emissions by the year 2010 has been in place since 1998. A majority in the European Parliament would also like to include heavy vehicles in the EU’s carbon dioxide strategy. The EU Commission has not yet presented any concrete proposals.

The issue of limiting carbon dioxide emissions from heavy vehicles is one example of how environmental demands and economically motivated demands can work in the same direction. For many years, heavy vehicle manufacturers have

More payload – fewer emissions



Transporting more freight on each truck can reduce the quantity of transport work, thereby lowering its environmental impact. In 1998, together with the German trailer manufacturer Krone, Scania presented a concept truck and trailer with an

overall length of 28 metres. This unit is longer than permitted under EU regulations (18.75 metres) as well as the Swedish–Finnish exception (25.25 metres). On the other hand, it can carry 50 per cent more payload than conventional

trucks and trailers. Fuel consumption per tonne-kilometre is reduced by around 20 percent and emissions by about 25 percent. Is this one example of a future solution for efficient transport work?

seen a growing demand from their customers to reduce fuel consumption, and thereby costs and carbon dioxide emissions.

New EU emission regulations

In July 1998, the European Parliament and the Council of the European Union approved new fuel specifications for petrol and diesel fuel. The threshold limit for

sulphur content in diesel fuel was set at 350 ppm starting in the year 2000. From the year 2005, European diesel fuel may have a maximum sulphur content of 50 ppm. Today there are no common regulations. The sulphur content of fuel marketed in the EU countries varies, but is normally between 400–500 ppm. The new EU regulations will bring the quality of fuel elsewhere in Europe close to the Swedish threshold limit of 10 ppm for low-sulphur diesel fuel.

In December 1998, the Council of the European Union submitted a proposal for a directive on exhaust emissions from heavy vehicles. These new “Euro 3” threshold limits and testing methods will initially apply to new vehicle models and engine types starting 1 October 2000, and to all new vehicles and engines from 1 October 2001 onward.

The proposal also imposes tighter requirements from 2005 and 2008 onwards, including lower threshold limits for particulate and nitrogen oxide emissions.

Since threshold limits are set several years in advance, vehicle manufacturers are able to concentrate their development resources and implement a changeover. The Council and European Parliament are expected to adopt these regulations in 1999.

Scania's position on the climate issue

The prospect of a change in the global climate due to anthropogenic emissions of carbon dioxide and other greenhouse gases is a pressing issue. Despite uncertainties regarding the magnitude of climate effects, economic, social and environmental consequences may be severe. Scania shares this concern together with the public, national governments and other parts of the business community.

Being a manufacturer of heavy vehicles and engines we recognize the fact that our products emit carbon dioxide during production and operation. We also recognize our responsibility to lower those emissions. We will reduce Scania's net emissions of carbon in the atmosphere by:

- improving the fuel-efficiency of our products
- advising and encouraging our customers to use our products in a fuel-efficient way
- improving our own use of energy in the production process
- continuing our research and development relating to the use of alternative fuels
- encouraging research and use of non-fossil replacement fuels

SCANIA'S ENVIRONMENTAL WORK

Scania shall be a market leader as regards the environmental characteristics of its vehicles and shall lower resource consumption and raise efficiency in its production system as much as possible.

Scania's mission

Scania's mission is to supply its customers with vehicles and services related to the transport of goods and passengers by road. By focusing on customer needs, Scania shall grow with sustained profitability, thereby generating shareholder value.

Scania's industrial operations specialise in developing and manufacturing vehicles that shall lead the market in terms of performance, life cycle cost, quality and environmental characteristics.

Scania's commercial operations, which include importers, dealers and service points, shall supply customers with optimal equipment and aftersales support, thereby providing maximum operating time at

minimum cost over the service life of their vehicles.

Since 1989, Scania has worked on the basis of a Group-wide environmental policy, which constitutes the foundation and framework of its environmental objectives and targets and thus also indicates the direction of its environmental work.

Scania most recently revised its environmental policy in 1998, taking into account the environmental reviews it had completed and the environmental issues that are considered important to Scania today. The new environmental policy applies from February 1999. It reflects Scania's goal of continually reducing the product's environmental impact during its entire life cycle.

Scania's environmental organisation

To ensure that environmental issues permeate all its operations and day-to-day work in a concrete manner, Scania has chosen to integrate environmental activities into its regular organisation as much as possible.

Ultimately in charge of the Group's environmental work is the Environmental Board, which makes decisions on environmental issues of strategic importance to Scania.

The more operative tasks at Group level are directed by the Environmental Committee, which also prepares issues for the meetings of the Environmental Board. The Environmental Committee comprises environmental coordinators from all of Scania's areas of operations. They, in turn, head environmental committees in their respective units.

Scania's environmental year

Scania's annual environmental work at Group level opens with a review by the Environmental Board. At this time, the Board follows up the results of the pre-

Environmental Policy

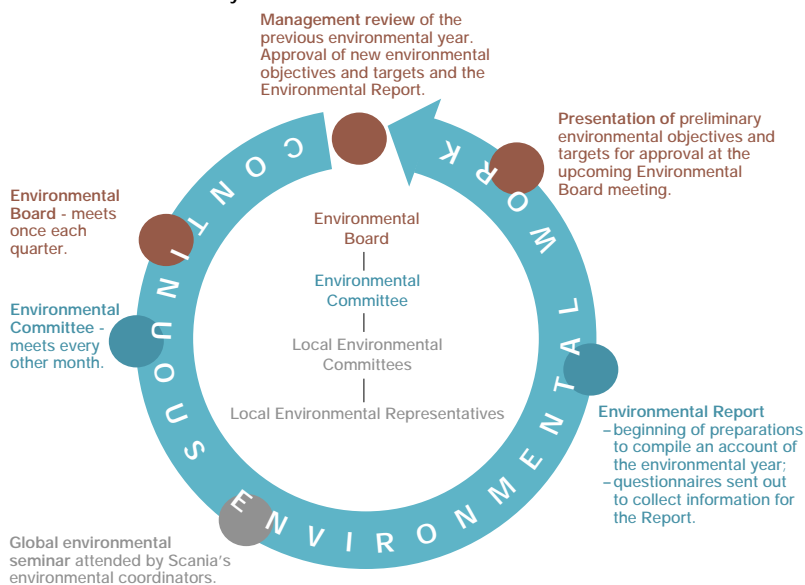
As a global manufacturer and distributor of heavy commercial vehicles, engines and related services, Scania is committed to develop products that pollute less and consume less energy, raw materials and chemicals during their life cycle.

In order to achieve this:

- we strive to maintain a lead in commercially applicable technologies
- we work well within legal demands and promote internationally harmonised, effective environmental requirements
- we prevent and continuously reduce the environmental impact through development of products, services and production processes
- we take the environmental aspects and objectives into account in our daily work
- we have an open and regular communication with our interest groups regarding our environmental work

By this we contribute to economical and ecological advantages for our customers and for society. Proactive environmental work is therefore of vital importance to Scania.

Scania's environmental year



as opinions and any complaints received from various interested parties.

Scania's environmental work is presented in its yearly Environmental Report and summarised in its Annual Report.

Environmental management system for Scania's industrial operations

In 1995, Scania began the task of creating a structure for systematic environmental work by implementing an environmental management system according to the ISO 14001 international standard and its European equivalent EMAS (the European Union's Eco-Management and Audit Scheme).

This task is in the final phase of the ISO 14001 certification process, leading to the issuance of one certificate per country.

Operations in Argentina, Brazil and Mexico have been certified since 1997.

In 1998, Scania implemented a totally integrated environmental management system including all industrial activities in

vious year's environmental activities and goals. Plans for the coming year are presented and new environmental goals are approved.

The Board also conducts a review of completed environmental audits as well

The Scania Environmental Board. From the left: Kaj Holmelius, Håkan Samuelsson, Louise Jarn Melander, Marcela Petkov, Urban Erdtman, Urban Wästljung, Arne Karlsson, Jaap Bergema, Ronnie Klingberg, Göran Hammarberg. Missing from the photo: Kaj Lindgren and Bengt Klingberg.



All workshop employees at Scania's production unit in Angers, France received environmental training during 1998. Part of this training was conducted directly at the various work sites in order to review the possible environmental impact of different work processes.



its Swedish operations, which also encompass Group headquarters departments. Thus, Scania is a forerunner among vehicle manufacturers in implementing an environmental management system that includes Group Management, product development, purchasing and logistics, haulage, manufacturing, the Group-wide marketing organisation, aftersales service, parts and distribution. In its Swedish operations, Scania expects the certification process to be completed during the first half of 1999.

During 1999, Scania also expects certificates to be issued for its operations in France and the Netherlands.

Environmental management system in commercial operations

Scania's commercial operations include marketing companies as well as repair and service workshops.

The next step Scania will take to reduce the environmental impact of its products during all stages of their service lives will

be to integrate its commercial operations into the environmental management system.

In 1998, a pilot project was initiated at Scania's dealerships in Stockholm with the aim of creating guidelines for how such environmental work should be designed.

Environmental training













Knowledge and a company-wide understanding of the importance of environmental issues are essential for achieving employee commitment and results in Scania's day-to-day environmental work. In 1996, Scania launched a broad training programme. By the end of 1998, more than 45 percent of Scania employees had undergone environmental training.

The training programme covers four areas: basic ecological knowledge, the environmental impact of transport work, Scania's overall environmental work as well as environmental issues that are important to each operation. From 1999 onwards, environmental training will be included in the training package for new employees.

Scania's environmental goals

The objectives stated in Scania's environmental policy are made more concrete by approving annual environmental targets. Most targets in the production system use 1996 as their base year.

The table below indicates the degree of fulfilment of selected 1998 targets. It also presents the targets that have been set up for 1999. Environmental targets that were not achieved in 1998 remain in effect during 1999 as well.

Environmental targets for 1998	Environmental targets for 1999
<p>By the end of 1998:</p> <ul style="list-style-type: none"> • all Scania industrial operations shall: <ul style="list-style-type: none"> – have implemented environmental management systems  – be ISO 14001 certified  • the current degree of material and component recyclability in Scania trucks shall be evaluated  • a list of specially restricted materials and chemicals used in Scania's production shall be available  • a guide shall be available for: <ul style="list-style-type: none"> – environmentally sound use of Scania's products  – environmentally sound maintenance of Scania's products  • guidelines on introducing environmental management systems at Scania's repair and service workshops shall be available  • environmental product declarations for Scania's trucks shall be available  • all regular suppliers and contractors shall be informed of Scania's environmental demands  • environmental self assessment at Scania's suppliers shall be conducted  • a system for monitoring and following up internal transport work shall be designed and tested  • the quantities of emissions from Scania's transport work between its main European production sites shall be reviewed.  	<ul style="list-style-type: none"> • All Scania industrial operations shall complete the implementation of environmental management systems and obtain ISO 14001 certification. • All employees in Scania industrial operations shall have received environmental training relevant to their work. • At least 75 percent of Scania employees and customers shall be satisfied with the company's work related to environmental issues. • The ongoing evaluation of the degree of material and component recyclability in Scania trucks and buses shall be completed. • A method for environmentally sound product development shall be available and be implemented in a pilot project. • Current efforts to create guidelines for introducing environmental management systems at Scania repair and service workshops shall be completed. • Phase-out plans shall be devised for blacklisted substances for materials used in production processes (supplies). • Energy consumption per manufactured unit shall be reduced by 10 percent. • Water use per manufactured unit shall be reduced by 10 percent. • The quantity of wastes sent to landfills shall be reduced by 20 percent per manufactured unit. • A procedure shall be developed for preventing and reducing the consequences of accidents, operational disruptions and soil contamination.

RESEARCH AND DEVELOPMENT FOR THE FUTURE

Intensive research and development work enables Scania to maintain its leading position as a manufacturer of vehicles with high environmental performance.

Scania's environmental work is based on reducing the environmental impact of its products throughout their life cycle. This means that environmental thinking is an integral part of the development of new engines and vehicles.

Research and development work is concentrated in Södertälje, Sweden. During 1998, R&D costs were SEK 1,085 m. (1,169).

Continual improvements

The further refinement of Scania's engines focuses mainly on systematically streamlining and improving diesel technology. This work is aimed at achieving both better fuel consumption and lower exhaust emissions. Longer service intervals and lower weight are other important ways to reduce environmental impact.

Development work for chassis and cabs focuses on reducing weight, lowering maintenance needs as well as reducing

aerodynamic drag and rolling resistance, among other things. Scania also endeavours to limit the number of different materials used in order to facilitate recycling.

Design for environment

In 1998, Scania continued its efforts to develop tools and procedures for achieving environmentally sound product development.

During the year, the company conducted an advanced pilot training programme in environmentally sound product development for designers. The programme will continue in 1999.

Cooperation with institutes of technology and universities

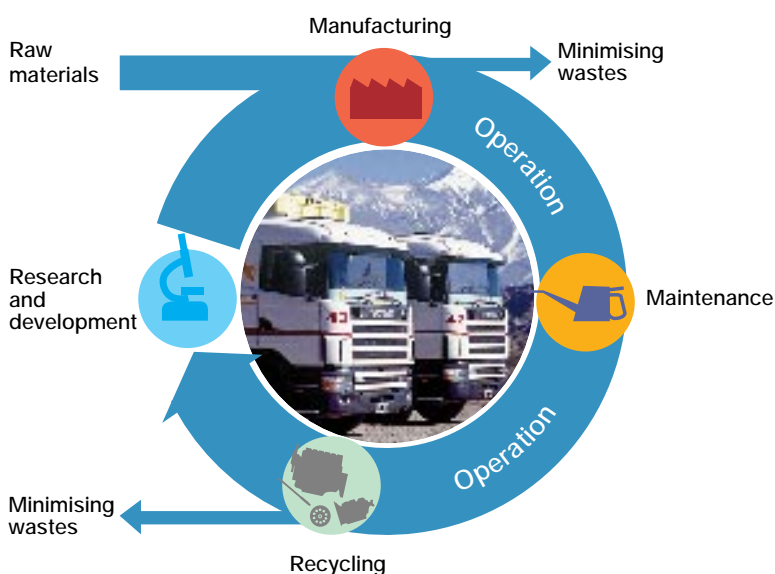
Cooperation with institutes of technology and universities is an important part of Scania's R&D work.

During 1998, Scania initiated the research project "Early Decision-Making in Product Development with Help of Environmental Indicators" in collaboration with the Swedish Environmental Research Institute and the Royal Institute of Technology in Stockholm. The project uses life cycle analysis (LCA) to develop a number of applicable indicators that can be used at an early stage of design work. These indicators will help ensure that future products have sound environmental features.

As part of Scania's programme for industrial researchers, an ongoing research project at the Lund Institute of Technology is studying flame structures, the formation of gas mixtures and emissions from so-called ATAC engines, which combine Otto and diesel technology.

During 1998, Scania invested about SEK 15 m. (15) in specific environmentally-related research projects at various institutes of technology and other institutions.

Seeing a product from a life cycle perspective comprises the foundation of Scania's research and development work. The biggest environmental impact, more than 90 percent, occurs during a vehicle's service life. This is why Scania implements various measures that prioritise improved fuel consumption.



SCANIA TRUCKS

Scania enables its truck customers and their customers to transport goods with the least possible impact on the environment.

Scania manufactures trucks for long-distance transport as well as for the regional and local distribution of goods and construction work.

Trucks, which are often the main working tools of Scania's customers, account for a significant portion of a society's total transport needs. This requires high standards of both economical and environmental performance.

High environmental performance worldwide

During 1998, Scania introduced its 4-series in Latin American markets. This means that Scania can offer customers all over the world vehicles featuring the high environmental performance – in manufacturing and in the product – that distinguishes the 4-series.

New low-emission engines

Scania has developed three new low-emission engines that fulfil the European Union's proposed new Euro 3 standard for emissions from heavy vehicles. The Euro 3 regulations, expected to go into effect from 1 October 2000, include lower threshold limits for emissions of nitrogen oxides, particulates, carbon monoxide and hydrocarbons.

The new engines have output ratings of 230, 340 and 420 hp.

During 1998, one of these engines – with a 9-litre swept volume – was introduced in buses. It will be introduced in trucks together with the other two engines in 1999. The engine's exhaust emissions are below the proposed Euro 3 levels. The engine is primarily intended for vehicles operating in city centres and other sensitive environments.

All engines are equipped with an electronic engine management system, there-

Scania's three new low-emission engines



DC901 230

The new 9-litre, 230 hp engine is designed for distribution vehicles that operate in urban areas and other sensitive environments where high concentrations of exhaust emissions attract increasing attention.



DC11 03 340

Many vehicles are used for regional distribution and must be adapted to both motorway driving and city traffic. The new 11-litre, 340 hp engine is designed for medium-weight vehicles used for regional distribution. It meets both performance and lower exhaust emission requirements.



DC12 01 420

The new 12-litre, 420 hp engine is intended for heavy vehicles that are used in long-distance haulage and that normally maintain an even cruising speed. Although long-distance haulage rarely includes city driving, it cannot always be avoided. Scania's DC12 01 420 thus provides a good combination of a powerful engine that simultaneously guarantees low exhaust emissions.

by giving customers the option of equipping the chassis with Scania Opticruise. Opticruise is a computerised gearchanging system that ensures better driving comfort and a safe driving style as well as better fuel consumption.

Holistic approach to development work

The aim of Scania's truck development work is to reduce the environmental impact of each transport task. This requires viewing the environmental gains that can be achieved on the various parts of a truck from a holistic perspective. By working with engine development, weight reduction and lower aerodynamic drag and rolling resistance – while also informing customers about how to drive more efficiently – Scania can ensure a gradual reduction in environmental impact.

Reduced weight – better fuel consumption

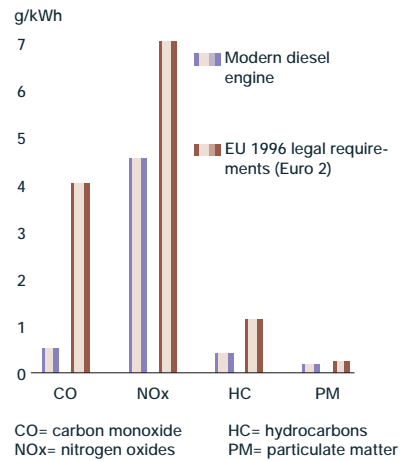
One way to reduce fuel consumption is to lower the unladen weight of the vehicle. Lower unladen weight allows more payload per transport task, which is often subject to weight restrictions. Measures implemented during 1998 resulted in weight reductions of up to 70 kg.

High pressure results in efficient combustion

Another way of improving fuel consumption is to make an engine's combustion process more efficient, thereby reducing emissions of environmentally hazardous substances. One method is to raise injection pressure. The unit injector, which is a combined pump and injector, injects fuel into each individual cylinder under very high pressure.

Together with the U.S. engine manufacturer Cummins, Scania has developed a second generation of unit injectors. The

Emissions from Scania trucks and buses compared to current legal requirements



new fuel injection system provides a platform for further reducing emissions of nitrogen oxides in particular, while maintaining good fuel consumption. Serial production of the new unit injectors began in 1999.

Gas-powered trucks in cities

Interest in distribution trucks powered by gaseous fuels is increasing among Scania's customers. The company continued to develop gas-powered engines in 1998. Gas-powered trucks have low nitrogen oxide and particulate emissions and are also quieter, which is important when distributing goods at night, for example. Scania's objective is to introduce gas-powered trucks for urban operation late in 1999.

Environmental information for customers

During the year, Scania compiled informational material and participated in various projects in order to satisfy customer demands for environmentally-related information when purchasing and driving trucks.

Scania will introduce an environmental

Scania Environmental Product Declaration

An environmental product declaration will be introduced in Scania's markets during 1999.

Resource consumption ¹⁾			
Water m ³	16	CO ₂ emissions, tonnes	1.6
Energy MWh, of which	13	Raw materials, tonnes, of which	4
Electricity	7	Steel	3
District heating	2	Iron	0.9
Diesel fuel	1	Others	0.1
Natural gas	1	Wastes sent to landfill, kg	150
Heating oil	1	Wastes for special disposal, kg	90
LPG, coal	1		

Composition ²⁾			
Material composition	Weight (kg)		Weight (kg)
Steel	3,700	Plastics	300
Cast iron ³⁾	1,200	Rubber	500
Aluminium	200	Glass	50
Copper, bronze etc.	50	Paints	50
Lead	50		

1) Total for Scania divided by the number of vehicles manufactured in 1998.
2) Approximate figures for Scania vehicles, excl. bodywork by other companies.
3) Of which some 30 percent is recycled.

Noise emissions	
Legal requirements according to EU directive 70/157/EEC (dB(A))	80
External noise levels (dB(A))	80
Compressed air noise (dB(A))	72



product declaration in its markets during 1999.

The environmental product declaration will provide customers with information on the environmental impact of a Scania truck during its manufacture, use and final dismantling. The declaration includes information on resource consumption during production, exhaust emissions and noise levels as well as recycling data. It also contains advice and instructions on servicing and maintenance as well as on how to achieve the least possible impact on the environment during truck use.

Scania also actively participated in compiling an environmental handbook that can be used in purchasing transport services. It was compiled under the guidance of Sweden's Transport Research

Institute and covers road haulage as well as air, sea and rail transport services. The handbook contains two types of questionnaires:

- A survey of hauliers
- A survey of transport solutions

Scania uses the handbook in its own operations to evaluate internal transport work.

During 1998, Scania also began revising its driver's handbook. The new version contains a special section on how to reduce a vehicle's environmental impact by means of proper driving techniques, service and maintenance.

SCANIA BUSES AND COACHES

Scania's new buses are a result of environmentally sound product development work.

Scania manufactures buses intended for both urban operation and long-distance passenger service. In its new bus range, Scania has significantly reduced the number of components by means of its modular system.

The new OmniCity bus

In 1998, Scania began manufacturing its new OmniCity urban bus at its plant in Katrineholm, Sweden. The OmniCity's modular body consists mainly of aluminium, fibreglass-reinforced plastic and glass. These light materials reduce the weight of the bus by around 600 kg, improving fuel consumption and raising passenger-carrying capacity.

The new production methods used for the OmniCity range have not only reduced its external environmental impact but also improved the working environment.

The aluminium body is assembled using bolts, which eliminates all welding. Components are no longer painted locally. Instead, they are already painted when they arrive at the assembly unit.

During the year, Scania introduced a new low-entrance bus – the OmniLink. It is built using the same modular concept as the low-floor OmniCity bus and also has an aluminium body.

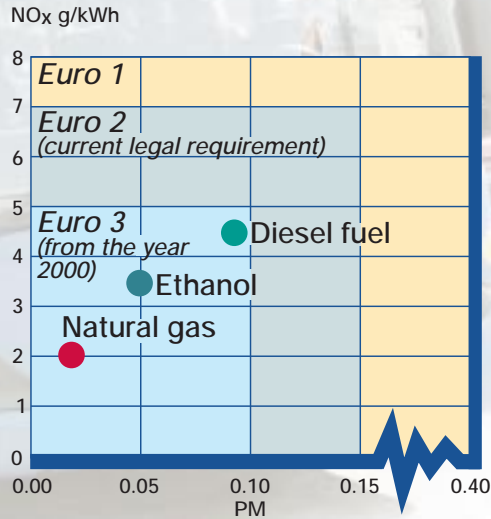
Scania assumes producer liability

During 1998, Scania decided to assume producer liability for the new OmniCity bus in the Swedish market. This means that Scania takes responsibility for dismantling and recycling the buses at the end of their service lives. To make this possible, Scania will sign agreements with one or more authorised dismantlers over the next two years.

Scania is the world's largest supplier of ethanol-powered buses. Today ethanol is used solely in local vehicle fleets, such as the one pictured here in Luleå – a city in northern Sweden – where there is good potential for ensuring the distribution of ethanol fuel.



Nitrogen oxide (NO_x) and particulate (PM) emissions from Scania's engines in relation to EU legal requirements.



increase in atmospheric carbon dioxide, provided that the fuel is produced from renewable raw materials.

In 1998, Scania delivered more than 70 ethanol-powered buses to the Swedish market, including 40 to the Greater Stockholm Public Transport Authority (SL). These articulated buses operate on the new bus network in central Stockholm and meet strict requirements for low emission levels of nitrogen oxides and particulates.

Scania has received orders to deliver another 74 ethanol-powered buses to the Swedish market during 1999.

In Latin America, Scania will begin producing ethanol-powered buses for the Brazilian market in 1999.

Alternative fuels in urban areas

Given the growing public demands for better air quality and living environments, and thus low emission and noise levels, city buses are the primary market segment in which bus customers will increasingly demand vehicles that are powered by alternative fuels.

Today buses powered by alternative fuels account for nearly 15 percent of Scania's city bus sales, an increase of 7 percentage points since 1996. During 1998, Scania's sales of alternative-fuel buses comprised buses that operate on ethanol and gaseous fuels.

Ethanol

Scania is the world's largest supplier of ethanol-powered buses. Today ethanol is used solely in local vehicle fleets where there is good potential for ensuring the distribution of ethanol fuel. Ethanol-powered buses have substantially lower emissions of nitrogen oxides, hydrocarbons and particulates than diesel-powered buses. In addition, ethanol-powered systems have the potential of reducing the net

Gaseous fuels

Today Scania sells buses powered by natural gas (CNG), biogas or liquefied petroleum gas (LPG). A gas-powered engine has low emissions of nitrogen oxides, particulates and other substances, but at the same time is 25 percent less efficient than a diesel engine.

During 1998, Scania delivered 125 gas-powered buses to Denmark designed for urban operation in Copenhagen. An additional 51 buses will be delivered in 1999.

In 1998, Scania also delivered four gas-powered buses to Santiago, Chile. They are part of a project aimed at improving air quality in Santiago.

Type of fuel	Number sold 1998	Total number sold since 1990
Ethanol	74	398
Gaseous fuels		
LPG	51	247
CNG	4	110
Hybrid		14

SCANIA INDUSTRIAL AND MARINE ENGINES

By a wide margin, Scania's industrial and marine engines fulfil the stricter environmental standards expected in the European and American markets.

Scania industrial and marine engines are developed from the company's vehicle engines and are used in earthmoving, forestry and agricultural machines, in generator sets and in commercial vessels and pleasure craft.

Material selection and recycling potential, as well as fuel consumption and maintenance, have been decisive factors in the development of new engines.

Introduction of new industrial and marine engines

In 1998, Scania began manufacturing a new 12-litre industrial engine with excellent fuel consumption and the lowest use of lubricating oil in the market – only 0.3 g per kWh. This is equivalent to half the normal consumption of other diesel engines

of the same size. The low consumption level is mainly attributable to a "Saver Ring" (a ring in the cylinder liner which prevents the build-up of carbon deposits), a design solution unique to Scania.

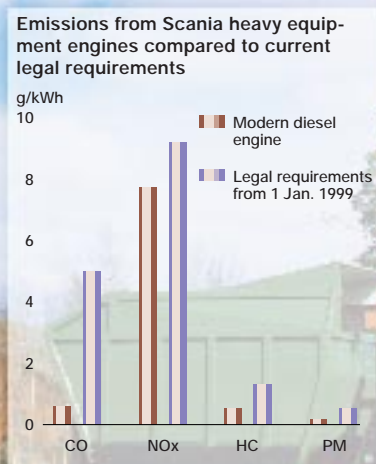
A marine version of this engine was also unveiled in 1998.

Lower emissions

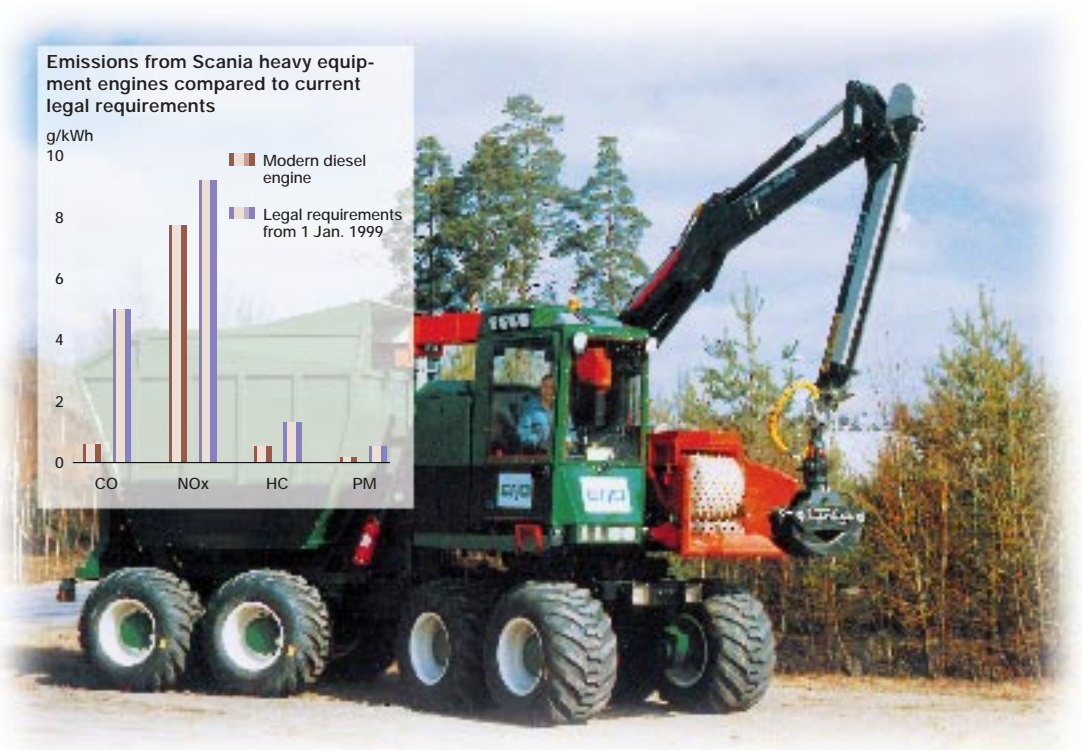
Legal requirements for emissions from industrial and marine engines are being tightened at an accelerating pace.

Scania's industrial engines for mobile installations are continually certified in accordance with the EU's directive on machinery and official US standards, for sales in the EU and the United States, respectively.

New EU emission requirements for industrial engines went into force on 1 January 1999. During 1998, Scania also began the process of certifying its engines in accordance with California Air Resources Board (CARB) standards.



The wood chipper Erjofanten 7/65RC, which is equipped with a Scania DS1 11 engine, chips forestry waste used as biofuel.



The HAM system – an interesting development for marine engines

During 1998, Scania participated in the "HAM" (Humid Air Motor) development project, which aims at further reducing nitrogen oxide emissions from marine engines. The HAM system was developed by Sweden's Munters AB and its German subsidiary Munters Euroform GmbH in close collaboration with Scania's laboratory for industrial and marine engines.

The HAM system is based on mixing water vapour with hot air from the turbo charger, thereby greatly reducing the combustion temperature. The quantity of nitrogen oxides, which is highly dependent on the combustion temperature, can thereby be reduced by 70 percent at normal engine speeds and loads.

The HAM system is still under development and a number of tests will be conducted before serial production can begin.



Scania's industrial engines meet both current and forthcoming EU and US standards.

The International Maritime Organisation (IMO), a UN specialised agency, regulates emission levels for marine engines. It is currently working towards establishing emission levels for marine engines designed for vessels weighing at least 400 gross tonnes with an engine output of more than 130 kW. Scania's marine engines with charge-cooling meet the proposed emission requirements by a wide margin.

During 1999, Scania will invest in new test cell equipment at its engine laboratory in Södertälje, Sweden. This investment – including a so-called particulate tunnel, which tests the composition of exhaust emissions – will make it possible to conduct certification testing of industrial and marine engines that takes into account future legal requirements.

Alternative fuels

For several years two Scania corporate partners, Waukesha in the United States and CES in Belgium, have developed and sold gaseous-fuel engines based on Scania engines. During 1998, CES developed a gas-powered version of Scania's new 12-litre engine. Waukesha and CES market these engines mainly in the United States, South America and western Europe.

Scania is also currently engaged in industrial and marine engine projects related to other alternative fuels, including ethanol.

SCANIA'S PRODUCTION SYSTEM

Since 1998, Scania has had a global product range and global production system in operation. Scania's manufacturing facilities meet the same environmental standards at its production units in Europe and Latin America.

Environmental protection work at Scania's production units is based on ambitious goals for using raw materials efficiently and reducing emissions into the air and discharges into waterways.

During 1998, the task of implementing an environmental management system designed to meet the ISO 14001 standard provided better conditions for carrying out systematic, target-oriented environmental protection work.

The following section presents the results in areas that Scania prioritises in its environmental work, in terms of re-

lative and total quantities over a three-year period. In certain areas such as raw materials, chemicals and wastes, the task of data gathering is still under development and figures are therefore only provided for 1998.

Use of raw materials

A Scania vehicle is made largely of raw materials such as steel, sheet metal and cast iron as well as aluminium. Scania is working to improve the efficiency of raw material use in its production system, among other things by developing processes that use less material and by reusing more material wastes. In 1998, Scania installed a briquetting facility in Södertälje for recycling cast iron chips.



Chips become engine blocks

In 1998, Scania installed a central briquetting facility in Södertälje for cast iron chips. These chips, which are residual products created when engine blocks are being machined, are dewatered and compressed into briquettes under high pressure. The briquettes are then melted and cast into engine blocks and cylinder heads at the company's foundry.

This investment is part of Scania's efforts to create closed-cycle production processes and flows to reduce the quantities of residual products and wastes leaving its production units.

An environmental and efficiency-raising investment in the range of SEK 7 m. thus enables Scania to reduce the quantity of cast iron that it purchases.

The reused cast iron has a composition that exactly meets Scania's quality assurance standards and has been found suitable for its own production processes. A conceivable next step would be briquetting and reusing the polishing dust also created as a residual product during engine block machining.

In 1998, the quantity of raw materials used in processing at Scania's production units totalled some 4,000 kg per vehicle, or around 200,000 tonnes altogether.

Use of chemicals

Scania's objective is to reduce the use of chemicals and gradually replace substances with alternative ones that are equally effective but less hazardous.

Today Scania's production process consumes large quantities of cutting emulsions, cutting oils, alkaline degreasing agents, hardening oil and lubricating oil. Reducing the use of these and other chemicals is achieved mainly through more efficient processing.

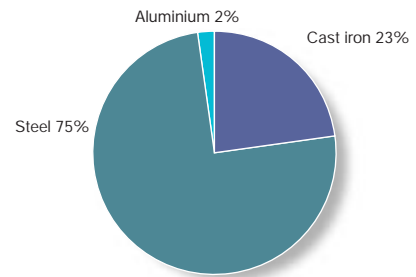
During 1998, Scania compiled lists of chemicals to be avoided or prohibited in its manufacturing process and in Scania products in the future. As an initial step, the company conducted a survey of its suppliers. This work will continue in 1999, after which phase-out plans for the chemicals will be prepared.

Scania's use of chemicals during 1998 amounted to about 0.1 cubic metre per vehicle, or a total of some 5,000 cubic metres.

Energy use

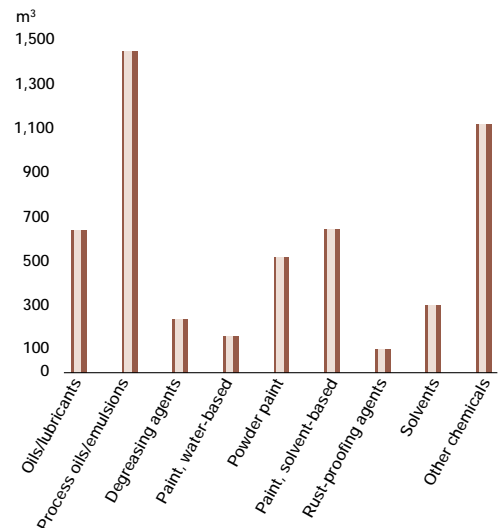
Vehicle manufacturing is an energy-intensive activity. All Scania operations employ advanced systems of energy management and heat recovery. Several Scania facilities have signed energy management agreements with public agencies. In Sweden, Scania has signed an agreement with the Swedish National Energy Administration for the so-called EKO energy project. In Zwolle/Meppel, Scania has an agreement with Dutch public authorities spanning several years. The goal there is a 20 percent reduction in energy use by the year 2000, using 1991 as the base year. This goal was already achieved in 1998.

Raw material use



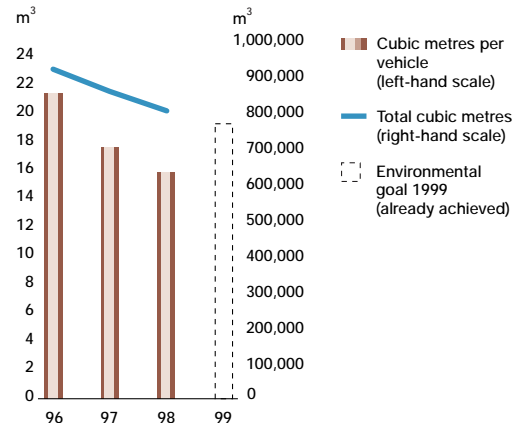
Raw material consumption during 1998 totalled about 4,000 kg per vehicle, or about 200,000 tonnes altogether, excluding finished components purchased.

Use of chemicals



Scania's use of chemicals in 1998 amounted to about 0.1 cubic metre per vehicle, or a total of some 5,000 cubic metres.

Water consumption



Water consumption in 1998 was about 16 cubic metres per vehicle, or a total of some 800,000 cubic metres.

Most of Scania's energy use consists of electricity. District heating, fuel oil and natural gas are used for heating. Diesel fuel is used for laboratory and acceptance testing of engines and finished vehicles. Liquefied petroleum is used in forges and coke in foundries.

Scania's target is to reduce energy consumption by 10 percent by the end of 1999 compared to 1996 levels. In 1998, energy use amounted to around 13 MWh per vehicle, a decrease of 20 percent since 1996. Thus, the environmental target has been met by a wide margin. The decrease is primarily a result of better monitoring and follow-up. Heat savings and energy recycling have also increased.

Discharges into water

Scania is working to reduce its water use and the diversion of process water and run-off into municipal wastewater systems.

Sanitary wastewater accounts for a large proportion of water use and discharges at Scania's facilities. Most liquid-

based manufacturing processes, including wet processing, alkaline degreasing and phosphatising, are closed-cycle. Used process baths are treated before being diverted to wastewater systems or disposed of externally.

Scania is working to reduce discharges into water by using more closed water cycles, extending the service life of baths, improving water treatment and reusing more treated water, among other things. The company's main long-term objective is that no water used in manufacturing processes should be diverted to the wastewater system.

Scania's target is to reduce water consumption by 10 percent by the end of 1999 compared to 1996 levels. In 1998, water use totalled around 16 cubic metres per vehicle, a decrease of 20 percent since 1996. Thus the environmental target has been met by a wide margin. The decrease is primarily a result of improved monitoring and follow-up, but also reduced water use for cooling.

Scania receives 1998 EKO energy prize



The 1998 EKO energy prize was presented on November 11, 1998 at a ceremony at the Grand Hôtel in Stockholm. Kjell Svensson, Senior Vice President Truck Manufacturing at Scania, accepted the prize from Thomas Korsfeldt, Director General of the Swedish National Energy Administration.

Scania was awarded the 1998 EKO energy prize for the energy-saving work at its Södertälje facilities, where heating savings have amounted to nearly 20 percent and compressed-air consumption has fallen by around 15 percent.

"Through the policy established by its Executive Management, where the use of energy is identified as an important environmental factor, Scania Partner has managed to involve and engage its personnel to achieve significant progress and reduce the negative load on the environment," the statement of the jury said in part.

Scania participates in the EKO energy project administered by Sweden's National

Energy Administration with the aim of streamlining and reducing energy consumption at its facilities. Based on its experience of the project in Sweden, Scania is now conducting an extensive survey of the energy savings potential of all its operations.

One of Scania's environmental targets is to reduce energy consumption by 10 percent per manufactured vehicle over a three-year period. This work has been highly successful at the Södertälje production unit. Among other things, district heat consumption has already been almost halved.

Air emissions

Emissions into the air at Scania's production units primarily result from the use of solvents in painting and rust-proofing, as well as from gases generated by various combustion processes.

Scania's efforts to lower solvent emissions focus on reducing consumption and switching to products that employ less solvents or none at all.

During 1998, water-based paints were introduced for applying primer to engine blocks and cylinder heads. This reduced solvent emissions from this process by about 80 percent.

Efforts also continue to reduce odorous emissions from Scania's foundry in Södertälje. The objective is to introduce other methods that reduce or completely eliminate the risk of odour-related problems.

Emissions of nitrogen oxides and dust from engine testing have decreased significantly thanks to improved engine performance, the use of better fuels and shorter testing periods in engine manufacturing. In accordance with the terms of Scania's operating permit for its Södertälje production unit, studies are underway to analyse the potential for further reducing nitrogen oxide emissions.

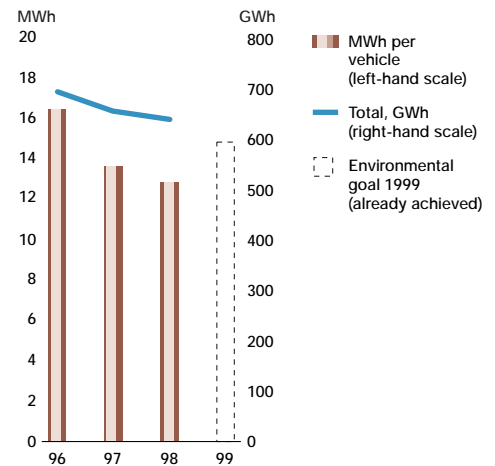
Scania's target is to reduce solvent emissions from painting and rust-proofing by 50 percent by the end of 2001 compared to 1996 levels. Emissions in 1998 totalled around 10 kg per vehicle, a decrease of 30 percent since 1996.

Planned measures – among other things related to the application of primer on chassis side members and finishing coats on cabs, engine units and gearboxes – should make it possible to achieve this target.

Waste management

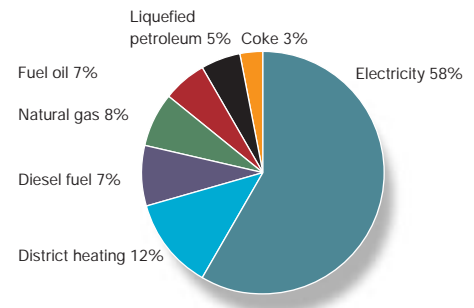
Most of Scania's solid wastes consist of recyclable foundry sand and residual products from metal processing.

Energy use



Energy use during 1998 totalled about 13 MWh per vehicle, or a total of some 640 GWh.

Energy use by type



About 58 percent of Scania's energy use consists of electricity.

Carbon dioxide emissions

	Energy use, GWh		Carbon dioxide emissions, Ktonnes	
	1998	1996	1998	1996
Electricity	370	360	22	23
District heat	80	130	6	9
Fossil fuels	190	200	49	51
Total	640	690	77	83
Per vehicle	13 MWh		1.6 tonnes	

Carbon dioxide emissions from Scania's production system in 1998 were 13 MWh per vehicle, or a total of 1.6 tonnes.

Scania has launched a number of projects to find alternative methods for disposing of wastes containing oils and metals, among other things. These projects, together with higher energy recycling of wastes, will cut the quantity of landfill wastes even further.

Scania's target is to reduce the quantity of wastes sent to landfills by 20 percent by the end of 1999 compared to 1996 levels. In 1998, the quantity of wastes sent to landfills totalled around 150 kg per vehicle, a decrease of 30 percent since 1996. The environmental target has thus been achieved by a wide margin. The decrease is primarily a result of greater at-source waste separation and recycling.

Operative disruptions

Emergency planning and preparedness are important in securing the operation of Scania's production system and related departments. Each unit has a plan for managing sudden stoppages and responding to alarms and accidents.

During 1998, no serious incidents were reported which caused any significant environmental impact or led to higher operating expenses.

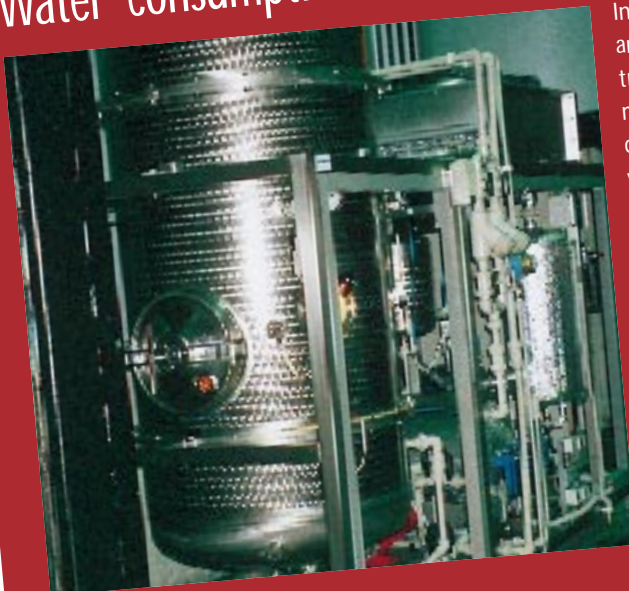
Ground surveys

During 1998, Scania began an inventory of its industrial sites. The production unit in Sibbhult, Sweden, which is partly located on a water reservoir, has functioned as a pilot plant. Scania introduced an updated monitoring programme for taking samples of surface water and groundwater. Experiences from this work will form the basis for ground surveys at other plants. Scania's objective is to inventory all its facilities no later than 2001.

Operating permits

Most of Scania's facilities around the world require operating permits. Besides Sweden, this is true of its facilities in France, Denmark, the Netherlands, Brazil and to a certain extent Poland. The plants in Argentina and Mexico operate according

Water consumption in Luleå is halved



In Luleå, Scania recently installed an evaporation facility for the treatment of emulsions from wet machining, water used in alkaline degreasing and water used for washing floors, among other things. Together with other water-saving measures, this has halved water consumption at the Luleå production unit during one year and resulted in savings of SEK 1.5 m. since 1996. The goal is to treat all wastewater and reuse it in production – in other words, operations should be completely free of process wastewater.



Scania has conducted ground surveys in Sibbhult, Sweden, including soil analyses and collection of surface water and groundwater samples

to the respective environmental legislation of these countries.

Scania runs Swedish operations that require permits in compliance with the Environmental Code. In recent years, all production units have been examined under the provisions of the Environment Protection Act in order to receive new permits.

During 1998, the production units in Sibbhult and Falun applied for, and were granted, permits for increased production. In accordance with the terms of their permits, the production units in Oskarshamn and Luleå have presented plans on how they will reduce their emissions into air and their water discharges, respectively.

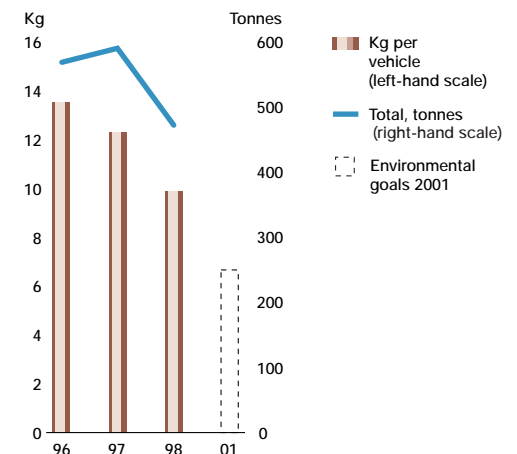
At the Zwolle/Meppel and Södertälje production units, noise is being reduced in order to meet stricter official standards.

Internal transport

Scania has a global production system with production and assembly units at 14 locations in eight countries. This demands an efficient transport system.

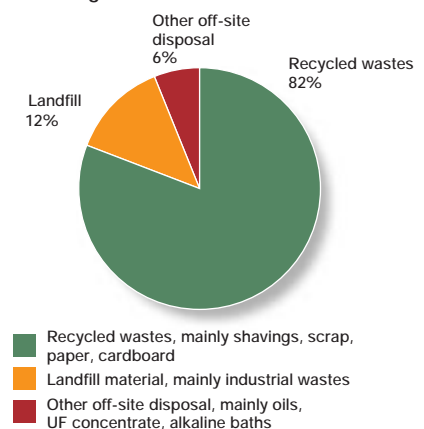
Scania's vehicles are manufactured according to customer specifications, which require that parts and components be at the right place at the right time and maintain the right quality.

Solvent emissions

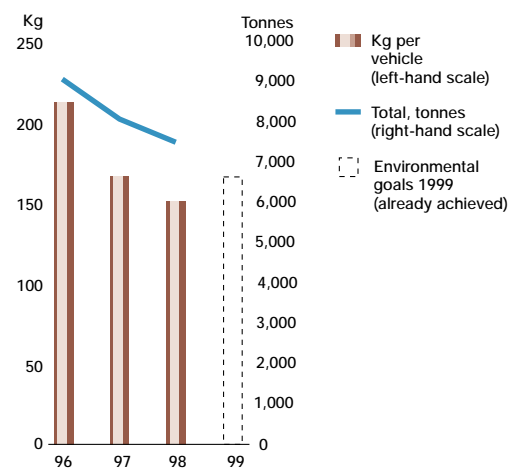


Solvent emissions in 1998 were below 10 kg per vehicle, or a total of some 470 tonnes.

Waste management



Wastes sent to landfills



Wastes sent to landfills during 1998 amounted to about 150 kg per vehicle, or a total of just above 7,500 tonnes.

In Europe, Scania is analysing its flows of goods in an effort to continue improving its efficiency and reducing its environmental impact.



Globally, Scania buys nearly SEK 1 billion worth of transport services every year. Road haulage accounts for about 70 percent of this amount. Haulage can be minimised, among other things, by better coordination of material flows.

An “open transport system” for delivering parts and components from Scania’s European suppliers to its plants in Europe has been in place since 1997. This means that hauliers may utilise cargo capacity not being used by Scania for other customers.

During the year, Scania has used the Swedish “Transport Buyers’ Environ-

mental Handbook” to analyse hauliers and transport solutions. The first step was analysing transport work to and from the axle factory in Falun. During the first half of 1999, Scania is continuing to analyse major flows of goods in Europe. This will enable the company to measure the emissions caused by this transport work and thereby obtain documentation for its continued improvement efforts.

ENVIRONMENT AND ECONOMICS

Proactive environmental work is of vital importance to Scania. It enables Scania to help generate economic and ecological benefits for itself, its customers and society as a whole.

Environmentally-related expenses and revenues

Environmentally-related expenses and revenues encompass those areas that are presented in the foregoing section on the production system and that are connected to Scania's environmental targets. During 1998, the total costs of raw material, chemical, energy and water use were about SEK 2,300 m., which is equivalent to some 5 percent of total sales. The savings that Scania generates by recycling its cast iron filings and scrap are equivalent to its waste management expenses.

Environmentally-related investments

Scania defines environmentally-related investments as investments that reduce its impact on the external environment. An investment can be justified solely for en-

vironmental reasons or constitute part of a total investment.

Scania's investments in production units are largely related to product launches. In conjunction with the launch of the 4-series during the period 1994-1998, Scania made investments that resulted in major environmental improvements. These included new painting facilities (powder paint and water-based paint) for chassis components and cabs in Europe and Latin America.

During 1998, Scania invested SEK 1,300 m. in its industrial operations, of which SEK 28 m. was classified as environmental investments. The single largest such investment was the construction of a new briquetting facility at the Södertälje production unit at a cost of SEK 7 m.

Insurance

Environment-related insurance for sudden, unforeseen environmental damage falls under general liability and product liability insurance and is not reported separately.

Summary, Scania production system			
Year	1998	1997	1996
Number of vehicles manufactured	49,977	48,141	42,356
Raw material use ¹⁾			
Per vehicle, kg	3,900	-	-
Total, tonnes	200,000	-	-
Chemical use ¹⁾			
Per vehicle, m ³	0,10	-	-
Total, m ³	5,200	-	-
Energy use			
Per vehicle, MWh	13	14	16
Total, GWh	640	660	690
Water use			
Per vehicle, m ³	16	18	22
Total, 1000 m ³	800	850	910
Solvent emissions			
Per vehicle, kg	10	12	14
Total, tonnes	470	590	570
Waste sent to landfills			
Per vehicle, kg	150	170	210
Total, tonnes	7,500	8,000	9,000

¹⁾ Since data gathering systems are still under development, figures have only been provided for 1998.

Overview of Scania production units and other facilities

Scania's environmental coordinators



Södertälje. From the left: Claes Pantzar, Eva Ramvall, Olof Nyström, Hans Eriksson, Mats Johansson, Olof Bäckdahl. Missing from the photo: Göran Löf.

	Södertälje	Luleå	Oskarshamn	Falun	Sibbhult	Katrineholm
Number of employees	5,557	692	1,680	685	457	753
Raw material consumption						
Cast iron, tonnes	20,000	1,540	0	7,330	5,110	0
Steel, tonnes	21,000	41,300	31,500	11,600	2,170	4,750
Aluminium, tonnes	720	0	0	0	1,040	465
Energy use ¹⁾						
Electricity, MWh	167,700	32,300	48,600	30,300	14,900	7,960
District heating, MWh	45,000	11,900	0	0	0	13,200
Fuel oil/natural gas MWh	850	~0	28,300	10,600	~0	~0
Other energy sources, MWh	82,900	~0	~0	~0	7,240	~0
Chemical use						
Oils/lubricants, m ³	190	130	29	51	48	40
Process oils/emulsions, m ³	360	21	17	67	76	0
Degreasing agents, m ³	40	24	75	26	8	1
Paint, water-based, m ³	5	13	0	144	0	0
Paint, solvent-based, m ³	82	38	196	8	0	9
Powder paint, tonnes	57	89	275	0	0	0
Rust-proofing agents, m ³	9	0	49	0	4	3
Solvents, tonnes	14	20	41	4	4	4
Others, tonnes	840 ²⁾	~0	46	19	~0	61
Chemicals delivered with the product						
Diesel fuel, tonnes ³⁾	880	0	0	0	0	172
Oils etc., tonnes	1,640	0	0	412	0	72
Emissions into air						
Organic solvents (VOC) ⁴⁾ , tonnes	56	11	130	20	0	9
CFC, HCFC, HFC, kg	325	~0	23	18	12	3
Discharges into waterways						
Water consumption, m ³	216,000	22,900	99,600	29,800	12,900	38,300
COD, tonnes	220	26	17	12	2.1	10
Oil, tonnes	2.0	0.36	0.13	0.13	0.06	0.32
Zinc, tonnes	0.07	0.01	n.a.	0.02	0.001	0.01
Waste management						
Material recycling, tonnes	14,200 ⁶⁾	7,810	13,200	5,670	2,000	522
Energy recycling, tonnes ⁵⁾	1,110	65	0	225	64	0
Landfill, tonnes	3,190	348	1,210	104	11	595
Other off-site disposal, tonnes	850	408	407	930	685	18

1) Excluding vehicle testing and transport work

2) Primarily foundry chemicals

3) Including ethanol and gas

4) Related to painting/rust-proofing

5) Combustion

6) Excluding foundry sand

Angers: Pontus Andreasson

Zwolle/Meppel:
Teun Groothedde

Silkeborg: Øjvind Christensen





Luleå: Gunnar Wikberg

Oskarshamn: Jan-Erik Lilja

Falun: Anders Lignell

Sibbhult: Christer Källman

Katrineholm: Hans Eriksson

Angers	Zwolle/ Meppel	Silkeborg	Slupsk	Tucumán	São Paulo	San Luis Potosí
519	2,112	430	170	869	2,389	52
0	0	0	0	2,100	9,850	n.a.
0	0	52	0	7,700	27,300	n.a.
0	0	128	0	270	985	n.a.
5,200	17,000	2,780	750	14,800	30,500	345
0	0	5,440	2,300	0	0	0
8,400	20,800	~0	~0	12,700	8,340	~0
~0	5,030	~0	~0	~0	3,460	~0
0	3	10	0	52	95	~0
0	5	0	0	98	804	~0
0	1	n.a.	0	2	65	~0
0	0	0	0	2	0	n.a.
20	153	20	18	1	103	n.a.
0	35	0	0	0	56	0
1	6	4	0	0	29	~0
6	55	16	9	32	97	~0
~0	85	27	5	~0	30	0
965	2,220	150	130	134	459	23
478	1,310	n.a.	163	139	522	5
15	95	10	10	3	114	1
~0	205	~0	~0	527	200	~0
13,000	54,600	10,700	6,400	78,500	179,000	40,000
n.a.	50	n.a.	n.a.	2	173	n.a.
n.a.	n.a.	n.a.	n.a.	n.a.	3.3	n.a.
n.a.	n.a.	n.a.	n.a.	n.a.	0.10	n.a.
311	1,190	200	0	1,440	5,040	17
0	0	172	0	0	0	0
144	653	50	60	290	803	n.a.
35	327	18	1	330	208	6

Slupsk: Gert Flodkvist

Tucumán: Peter Palmér

São Paulo: Augusto Fagioli

San Luis Potosí: Stig Östelius



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