CONTENTS

Statement of the President and CEO 1

Scania today 2

Scania's environmental policy 4

Intensified environmental work 6

Life cycle perspective conveys the big picture 8

Research and development 9

Efficient production methods reduce environmental impact 10

Making products with sound environmental characteristics 15

Focus on the entire vehicle 16

Switching to alternative fuels 19

Correct use better for the environment 21

When a vehicle reaches the end of its service life 23

Environment and economics 24

Goals for 1997 25

Glossary and explanations 26

Contact names and addresses 28
STATEMENT OF THE PRESIDENT AND CEO

What you are now holding in your hand is Scania's first separate Environmental Report. We compiled this report to demonstrate how our processes and products affect the environment and what we are doing to minimise negative effects. We at Scania consider it our responsibility to work continuously to improve the environment, both at the local and global level. The purpose of an annual Environmental Report is to provide ourselves and the general public with an overview of our goals and efforts related to environmental work.

We have demonstrated both our willingness and ability to achieve results in the environmental field. The latest example is the introduction of a new generation of trucks, the 4-series. In conjunction with the changeover of our production system to manufacture the new trucks, we continued to modernise our production and assembly plants. Among other things, this enabled us to further reduce negative environmental effects of manufacturing operations. The development of Scania's new 12-litre engine led to a product that consumes less fuel and emits smaller quantities of environmentally harmful substances than its predecessors.

The environmental impact of the transport sector will nevertheless remain in focus for many years to come. Environmental performance will become an increasingly high-priority factor for our customers – and their customers in turn – when choosing ways to transport both goods and passengers. In order to maintain our position as one of the world’s most successful manufacturers of heavy vehicles, we must therefore compete on the basis of the environmental performance of our products. We are investing aggressively in preventive environmental work. Our ambition is to continuously be better than the world demands of us.

To achieve this, everyone at Scania must feel a responsibility for environmental work and a commitment to it. Today all Scania managers are already responsible for integrating environmental issues into their operations. But pursuing coordinated environmental work at a company of Scania’s size and nature is a complex, difficult process. We still have a long way to go before we can begin to feel satisfied. To facilitate this task, we have chosen to introduce an environmental management system. This will enable us to create environmental goals for our operations that are comprehensive as well as concrete and measurable. We have also begun a large-scale environmental training programme for all our employees. The ambition is that all of Scania’s more than 20,000 employees will have undergone environmental training by 1999 at the latest.

Scania must continuously improve its environmental work. Our goal is for people to associate Scania with good environmental work as spontaneously as they now associate us with quality. Please regard this publication – our first Environmental Report – as an invitation to a dialogue aimed at attaining this goal.

Södertälje, Sweden, April 1997

Leif Östling
President and CEO
Scania is one of the world’s leading manufacturers of trucks and buses for heavy transport work. Its strategy is to grow with sustained profitability. Some 95 percent of the company’s production is sold outside Sweden.

Scania’s mission statement
Scania’s operations are focused principally on the field of heavy vehicles designed for the transport of goods and passengers. Its products shall lead the market in terms of quality, performance and environmental characteristics, enabling the company to assure its customers of the best possible transport economy.

Scania’s strategy is to grow with sustained profitability by means of high cost-effectiveness in product development, production and marketing, as well as by maintaining a strong global market position.

Scania operates worldwide
Scania is represented in about 100 countries at 1,000 distribution points and 1,500 service points. The company has production facilities and assembly plants in eight countries in Europe and Latin America: Sweden, the Netherlands, France, Denmark, Poland, Brazil, Argentina and Mexico. In addition, there are plants in about a dozen more countries in Europe, Asia, Africa and Latin America that perform local assembly from knocked-down kits.

The number of employees at the close of 1996 was 22,206, down 4 percent from a year earlier. Women represented about 10 percent of the total. Scania has employees in more than 40 countries, about half of them in Sweden.

Products

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

Buses
City buses, inter-city buses and tourist coaches for more than 30 passengers.

Industrial and marine engines
Engines with power outputs ranging from 225 to 750 horsepower for use as a power source in generator sets, earth-moving and agricultural machinery, ships and pleasure craft.

Half-owner of Svenska Volkswagen
Scania and Volkswagen AG each own 50 percent of Svenska Volkswagen AB, which markets Volkswagen, Audi, Seat, Skoda and Porsche cars (and light commercial vehicles) in Sweden.

1996 stock market listings
On 1 April 1996, Scania’s shares were floated on the Stockholm Stock Exchange and also became the first Swedish shares to gain a listing on the New York Stock Exchange. The listings were a natural consequence of the fact that in May 1995, Scania once again became an independent company after having been part of Saab-Scania for 26 years.

At the close of 1996, Scania had about 50,000 shareholders. The ten largest shareholders accounted for 67 percent of voting power and 66 percent of share capital. The largest shareholder is Investor AB, a listed Swedish investment company in the Wallenberg sphere, with 45 percent of share capital and 45 percent of voting power. Of Scania’s share capital, about 16 percent is owned by investors outside Sweden.
Scania is represented in about 100 countries. Its production and assembly plants are located in eight countries in Europe and Latin America.
SCANIA’S ENVIRONMENTAL POLICY

Caring for the environment and active environmental work are crucial to Scania’s long-term growth and profitability. Scania's environmental policy provides a framework and guidelines for this growth.

Scania’s environmental policy is based on the 16 principles for environmental management issued by the International Chamber of Commerce (ICC). They are summarised in four objectives that are important to Scania.

1. Scania shall achieve and maintain leadership within its field of competence in order to promote a better environment.

This means that Scania will take the lead in environmentally adapting products and production processes. Scania is introducing an environmental management system to ensure continuous improvement of the reporting and management of environmental work. All employees will become closely involved in this environmental work through continuous human resource development and training. Scania also requires that its suppliers and contractors environmentally adapt their operations. It informs its vehicle users of environmental issues in order to enhance their environmental awareness.

2. Scania shall by foresighted research and development continuously reduce the environmental impact coming from its production, products and services.

Scania’s research and development work is aimed at preventingly reducing the environmental impact of its products. Priorities include reducing quantities of materials used, increasing the share of more environmentally sound materials and fuels, and improving fuel efficiency. Production processes are being optimised by means of detailed audits and follow-up work. The company promotes reuse and recycling of materials in Scania vehicles at the end of their service lives and reduction of the quantities of wastes generated during servicing and maintenance.
Scania shall actively promote internationally harmonised and effective environmental legislation - for Scania current legislation is the minimum standard.

Effective and internationally harmonised legislation for the transport industry can be achieved through dialogue with public authorities in all countries where Scania operates.

Scania shall increase the confidence in its environmental work through openness and regular environmental reporting.

Scania is engaged in a continuous dialogue with customers, suppliers, shareholders, legislators and the general public to increase confidence in its environmental work. It also actively and openly reports on its environmentally-related goals and achievements and publishes a separate annual Environmental Report.

A summary of ICC’s 16 principles for sustainable development

To recognise environmental management as among the highest corporate priorities; to establish policies, programmes and practices for conducting operations in an environmentally sound manner.

To integrate these policies, programmes and practices fully into each business as an essential element of management in all its functions.

To continue to improve corporate policies, programmes and environmental performance, taking into account technical and community expectations, with legal regulations as a starting point.

To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

To assess environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site.

To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, reused or disposed of safely.

To advise, and where relevant, educate customers, distributors and the public in the safe use, transportation, storage and disposal of products provided; and to apply similar considerations to the provision of services.

To develop, design and operate facilities and conduct activities taking into consideration the efficient use of energy and materials, the minimisation of adverse environmental impact and waste generation, and the safe and responsible disposal of residual wastes.

To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with the enterprise.

To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improvements in their practices; and to encourage the wide adoption of these principles by suppliers.

To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with the emergency services, recognising potential transboundary impacts.

To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

To contribute to the development of public policy and to business, governmental and intergovernmental programmes and educational initiatives that will enhance environmental awareness and protection.

To foster openness and dialogue with employees and the public, anticipating and responding to their concerns about the potential hazards and impacts of operations and products, including those of transboundary or global significance.

To measure environmental performance; to conduct regular environmental audits and assessments of compliance with company requirements, legal requirements and these principles; and periodically to provide appropriate information to the Board of Directors, shareholders, employees, the authorities and the public.
INTENSIFIED ENVIRONMENTAL WORK

Scania’s environment-related work is a natural and integral part of its operations. During 1996 Scania further intensified its environmental efforts in order to certify the Group as complying with ISO 14001 international environmental management standards by 1999.

Overseeing Scania’s environmental network
Overall responsibility for environmental matters rests with Scania’s Environmental Board, which establishes the Group’s environmental policy and other guidelines for its environmental work.

Scania’s Environmental Coordinator oversees and coordinates an internal “environmental network” that constitutes the company’s environmental organisation. This network consists of employees from management staff units and the line organisation who are responsible for internal and external environmental work.

The heads of all Scania companies and units are responsible for adapting the Group’s overall environmental policy to local conditions. This policy is then translated into goals and strategies for each respective operation.

Introducing environmental management systems
To effectively translate the Group’s mission and environmental policy into local measures, Scania is working towards certification under the ISO 14001 environmental management system.

As part of this task, initial environmental reviews were initiated at all Scania facilities during 1996. These reviews have already been completed at three Swedish facilities – in Luleå, Katrineholm and Södertälje – as well as in Brazil.

According to plans, ISO 14001 certification will go into effect in Latin America during 1998 and in Europe during 1999. Scania’s efforts to introduce ISO 14001 standards will also enable it to register its facilities according to the Eco-Management and Audit Scheme (EMAS) of the European Union (EU).

Parallel with the introduction of the environmental management system, during 1996 Scania began an environmental training programme for all Group employees. Training is expected to be completed in 1999.

Cooperation with suppliers and contractors
One important aspect of Scania’s environmental work is its cooperation with suppliers and contractors. In 1996 Scania brought together its 50 largest contractors at Head Office in Södertälje to inform them of its environmental policy, future legal requirements and the introduction of ISO 14001. Scania’s goal is to more efficiently
Scania’s Brazilian plant has progressed furthest in the Group in its efforts to introduce ISO 14001 environmental management principles.

At-source waste separation at the plant in Tucumán, Argentina, within the framework of the municipal pilot programme for waste management.

apply the new environmental standards to its suppliers and contractors as early as the purchasing stage. The task of developing a checklist for assessing the environmental work of its suppliers and contractors is continuing.

During 1996 Scania also audited all transport flows from suppliers to, as well as between its European production plants. As a result, in the spring of 1997 Scania will reduce the number of hauliers it uses from 20 to five, which also means a reduced total need for vehicles to pick up and deliver freight for Scania. This will also lead to a decline in the number of collections from Scania’s suppliers and a consolidation of deliveries to its respective production sites.

**Cooperation with local authorities**

Cooperation with public authorities and politicians is another aspect of Scania’s environmental work. In Sweden, Scania works together with Södertälje, Katrineholm, Luleå and other municipalities in their Agenda 21 work. In Luleå, for example, Scania Chassis Components works closely with the municipality in improving waste management.

In Tucumán, Argentina, Scania runs the municipal pilot programme for handling residual products and wastewater, among other things.
The objective of Scania's environmental work is to reduce the effects of its products on the environment throughout their life cycle. Scania estimates that more than 90 percent of a heavy vehicle's environmental impact occurs during its service life, not during manufacture.

To correctly assess a vehicle's environmental impact, it is necessary to look at its entire service life—from manufacture to final dismantling.

**Life cycle assessment and life cycle cost calculation - important tools**

Life cycle assessment (LCA) is a central tool of environmental work. A life cycle assessment involves describing and evaluating a vehicle's environmental impact at all stages, from manufacture through operation to final disposal as waste. Scania uses life cycle assessments to improve its decision making process, for example in product development work.

Life cycle cost (LCC) calculation is a tool Scania uses to estimate the total costs of energy-intensive equipment, in order to reduce both costs and adverse environmental effects. Besides investment costs, LCC also takes into account costs related to maintenance, energy and environmental pollution. During 1996, 80 employees at Scania's Swedish facilities received LCC training. Employees at all production units are scheduled to participate in this training programme during 1997.
One of the major challenges facing engine development is the fact that in a diesel engine the ratio between nitrogen oxide emissions and fuel consumption (in other words, carbon dioxide emissions) is, in principle, inversely proportional. Measures that lower nitrogen oxide emissions reduce the engine's efficiency rating, thereby also raising fuel consumption.

Cooperating with institutes of technology and universities
Continuous development work is needed to further reduce the environmental impact of diesel engines, primarily by lowering nitrogen oxide emissions at the same time as fuel consumption is reduced. Methods for catalytic conversion of gaseous emissions or better control of the combustion process are among Scania's R & D priorities. In 1996 – as part of its development work and in addition to its regular research programme – Scania invested SEK 5 million in a joint research project with the Lund Institute of Technology.

Scania's industrial research programme
In 1996, Scania established an industrial research programme together with Sweden's institutes of technology. The programme comprises a total of 10 research positions for postgraduate students pursuing doctorates and licentiate degrees, including research in the fields of product development, production engineering and the environment.
EFFICIENT PRODUCTION METHODS REDUCE ENVIRONMENTAL IMPACT

The strategy at Scania’s production plants is to continuously implement improvements to minimise environmental impact and create a good working environment. Reducing raw material and energy use and switching to less environmentally hazardous materials are important goals.

Many parts of Scania’s operations use advanced energy management and heat recovery systems. This photo is from the foundry in Södertälje.

Scania manufactures its products in Sweden and at facilities elsewhere in Europe and in Latin America. In this first Environmental Report, the ambition is to describe the manufacturing process and to report on Scania’s European plants. In the 1997 Environmental Report, Scania intends to provide information on all its facilities, and with a broader scope than has been possible in this 1996 report.

Advantages of the modular system
Scania designs its vehicles and plans their production on the basis of a unique modular system. In this way, Scania has been able to reduce the number of components in its product range. This, in turn, also reduces the need for storage space, heating and haulage to production plants. The guiding principle in Scania’s product development work is to avoid increasing the number of parts and, if possible, continue to reduce the existing number.

Lower energy use - an important goal
The production of vehicles and engines is energy-intensive. For reasons of cost as well as environment, Scania has for years taken steps to reduce total energy use. Today large portions of its operations use advanced systems of energy management and heat recovery. For example, the engine development laboratory in Södertälje recycles heat and electricity. Scania’s foundry in the same city has a waste heat boiler for recovering heat via a recuperator. Together with higher production capacity utilisation, these are some of the measures that have helped lower energy use per manufactured vehicle by 20–35 percent in recent years.

Scania’s goal is to reduce energy use by a further 10 percent per manufactured vehicle by the year 2000, using 1995 as a base year. Another important goal for Scania is to lower base use of energy, in other words the portion of energy use that remains the same regardless of how many vehicles are produced.

Energy use in 1996
In 1996, energy use at Scania’s European plants amounted to 660 GWh, or 20 MWh per vehicle. The plant in Södertälje, where most manufacturing takes place, accounts for more than 50 percent of total energy use.
The majority of this consists of electricity, district heating, fuel oil and natural gas. Large quantities of diesel fuel are also used for laboratory and acceptance tests of components and products.

**EKO energy project in Södertälje**

Scania is now conducting a thorough audit of its production units aimed at further reducing their energy use. During 1995 and 1996, Scania signed agreements with the Swedish National Board for Industrial and Technical Development (NUTEK) to

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**Scania's guidelines for energy use**

- Special consideration for energy efficiency shall be taken when purchasing equipment for workshops, laboratories and offices.
- A complete estimate of life cycle cost (LCC) shall be conducted before acquiring energy-intensive equipment.
- Energy use at existing facilities shall continuously be monitored.

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**Scania's energy use in Europe by type, 1996**

- Electricity 48%
- Diesel 11%
- Coke 2%
- Liquid gas 4%
- Natural gas 7%
- Fuel oil 8%
- District heating 20%

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**Scania's energy use in Europe, 1996**

- Total, GWh
- Average MWh per vehicle

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streamline energy use at ten of Scania’s Swedish plants. So far, analyses have taken place at four facilities in Södertälje and in Luleå. These analyses indicate total potential electricity and heating savings of 60 GWh per year, or SEK 18 million. Overall, Scania estimates that the project will reduce energy use by 110–120 GWh per year. The EKO energy project is expected to be completed at all Swedish production plants and units within the next few years.

**Installation of a central cooling plant**

A central cooling plant will be installed in Södertälje in early 1997. It will replace 315 local CFC-based cooling systems. For Scania, this entails an investment of SEK 26 million during 1996-1999. Central cooling systems have many advantages. Instead of CFCs, they use ammonia, which is less environmentally hazardous than other known alternatives. Central cooling systems also facilitate heat recovery, which has not been possible with current systems. Scania expects the switchover to central cooling to result in annual savings of SEK 1.5 million.

**Switching to water-borne and powder paints**

Emissions of solvents (volatile organic compounds) have long been an important target of Scania’s environmental protection efforts. By reducing paint consumption and switching to paints that employ less solvents or none at all, Scania has reduced its relative consumption and has thus reduced solvent emissions by around 75 percent over the past 10 years.

Painting concepts introduced at Scania’s facilities in early 1993 have greatly contributed to this trend. At that time, several Scania plants switched from paints based...
on environmentally hazardous solvents to water-borne paints and powder painting. In recent year, this has been Scania’s largest single investment – SEK 330 million – in environmental improvement measures related to its manufacturing process.

In 1996, solvent consumption at Scania’s European plants amounted to just over 400 tonnes, or 13 kg per vehicle.

Projects are under way to further reduce the use of solvents, for example when applying primer on chassis side members and finishing coats on engines, gearboxes and cabs.

**Diesel exhaust emissions**

In Södertälje, extensive laboratory and acceptance tests of engines generate emissions of diesel exhaust gases containing nitrogen oxides and particulates. Emissions at Scania’s Södertälje facilities in 1996 totalled 105 tonnes of nitrogen oxides and 1.4 tonnes of particulates. Scania is now working to further improve engine performance and shorten engine acceptance test times.

**Closed-circuit systems reduce water use**

Scania’s work concerning emissions into waterways has focused on reducing water consumption as well as the quantity of wastewater and other liquid wastes. In 1996, water consumption at its European production plants totaled 600,000 cubic metres, or 18 cubic metres per vehicle. Relative consumption has fallen by between 20 and 30 percent over the past five years.

A large proportion of water use and discharges is attributable to sanitary wastewater. Most of today’s liquid-based production processes are closed-circuit. Used process baths are treated for recycling or discharge into the wastewater system. There are still emissions of small amounts of oil, other organic substances and metals. Scania’s goal is to eliminate wastewater from its production processes by switching to completely closed-circuit systems.

**Management and reuse of residual products**

Disposing of residual products and wastes from production processes is both resource-intensive and costly. One special goal of waste management is to reduce the amount of hazardous industrial waste such as oils and alkaline process baths. Such residual products as shavings, scrap and wood must be recycled.

Residual products from Scania’s European plants totaled 50,000 tonnes in 1996. Of this amount, 75 percent, mostly

<table>
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<th>Diesel exhaust emissions (Södertälje)</th>
<th>Fuel consumption</th>
<th>Nitrogen oxides</th>
<th>Particulates</th>
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shavings and scrap, was recycled while 5 to 10 percent, mainly waste oil, was disposed of as hazardous waste. To reduce the amount of waste sent to landfills today, Scania aims to further develop a system for separation of paper, wood, plastic waste and other materials.

Environment-related insurance
Like most other Swedish companies, Scania makes payments to a national environmental damage consortium. This fee is used to cover the costs of any measures that must be undertaken to deal with environmental damage in cases where no guilty party can be determined.

Both Scania’s property and liability insurance contracts cover sudden, unforeseen environmental damage at its own facilities as well as damage that affects a third party.

Environment Protection Act
All of Scania’s Swedish plants have recently been, or will soon be, inspected to ensure their compliance with the Environment Protection Act as a condition for receiving new permits to expand production. In 1996 no violations of the Environment Protection Act were reported at Scania’s facilities.
MAKING PRODUCTS WITH SOUND ENVIRONMENTAL CHARACTERISTICS

Most of a heavy vehicle’s environmental impact occurs during its service life. Exhausts, noise and maintenance affect the environment. As a vehicle manufacturer, Scania has a major responsibility to continuously develop vehicles that combine good transport economy and low environmental impact.

Concentration on trucks and buses

Scania is the only major European vehicle manufacturer with operations that concentrate on heavy trucks designed for long-distance haulage, construction and civil engineering haulage and distribution work.

Late in 1995, Scania unveiled its new generation of trucks, the 4-series, as well as its new six-cylinder, 12-litre diesel engine. This engine is designed to provide maximum combustion efficiency, low exhaust emissions, low engine noise and a consequent reduction in environmental impact. Other features include greater ease of service for scheduled maintenance and repairs.

In the same way, Scania’s bus and coach operations concentrate on the heavy segment of the market. Scania manufactures bus chassis and buses designed for more than 30 passengers. Its product range comprises urban and inter-city buses as well as tourist coaches.

In September, Scania introduced the OmniCity city bus, the first model in a new modularised generation of buses and bus chassis. This new generation of buses combines good transport economy with good environmental characteristics, both in terms of better material selection and more efficient engines.

Industrial and marine engines

Scania manufactures industrial and marine engines used as power sources in earth-moving, forestry and agricultural machines, in generator sets and in commercial vessels and pleasure craft.

Scania’s industrial and marine engines are developed from its truck engines. This also enables Scania to influence the development of efficient products outside the transport sector. The European product range of industrial and marine engines was completely updated in 1996 to better meet demands for enhanced performance, including lower fuel consumption, lower emissions and higher outputs.
FOCUS ON THE ENTIRE VEHICLE

Scania’s mission is to manufacture products that lead the market in terms of quality, performance and environmental characteristics. As a result, today’s Scania products have significantly longer service lives and lower fuel consumption than in the past.

Most of Scania’s vehicles are equipped with diesel engines that run on some form of diesel fuel. Nitrogen oxides, hydrocarbons, particulates and other substances with an adverse effect on the environment are formed during the combustion process. Burning fossil fuels also results in a net increase in carbon dioxide in the atmosphere.

Scania is working systematically both to reduce emissions of environmentally hazardous substances from its diesel engines and to reduce fuel consumption (in other words, carbon dioxide emissions). Over a 25-year period, the quantity of fuel required to perform a given transport task has fallen by about 60 percent owing to

Environmental impact of diesel fuel

- Carbon monoxide (CO) is a toxic gas formed through incomplete combustion. The gas is toxic to humans but is only present at very low levels in diesel exhausts.
- Nitrogen oxides (NOx) are formed by a reaction between oxygen and nitrogen at high temperatures. Nitrogen oxide emissions contribute primarily to over-fertilisation (eutrophication), acidification and the formation of tropospheric (ground-level) ozone.
- Hydrocarbons (HC) in diesel exhausts are residual products that are formed during combustion and that contain unpleasant-smelling compounds. At high levels, carcinogenic effects on humans and animals have been demonstrated. Along with nitrogen oxides, hydrocarbons contribute to the formation of tropospheric ozone.
- The particulate matter (PM) emitted by a diesel engine is largely determined by the quality of the fuel. The aromatic hydrocarbons in diesel fuel contribute to higher emission levels of both particulates and nitrogen oxides. Today’s diesel fuel also contains a small proportion of sulphur, which contributes to acidification. This problem cannot be solved by improving engine technology, but only by eliminating the sulphur from the fuel.
Scania Environmental Report 1996

Lower aerodynamic drag is an important objective in the design and body configuration of a vehicle. Drag affects fuel consumption and exhaust emission levels.

Intensive development work. Carbon dioxide emissions, which are directly proportional to the quantity of fuel burned, have decreased at a similar rate. Nitrogen oxide emissions dropped by 90 percent during the same period. Particulates and hydrocarbons have fallen at the same rate as fuel consumption.

In recent years, the task of developing Scania’s new 12-litre engine and upgrading its 14-litre engine has concentrated on lowering exhaust emissions and improving fuel economy. Emission levels have been reduced far below current legal requirements. Scania’s engines meet the EU’s Euro 2 standards for both trucks and buses. Today Scania’s engine development efforts are focused on meeting future standards, primarily Euro 3.

Overall vehicle design is important
In discussing exhaust emission issues, the general public and legislators have largely focused on engines. It is important, however, to understand how the overall development and use of a vehicle can help lower emissions.

For example, reducing aerodynamic drag was a measure Scania prioritised when developing its new cab for the 4-series. Giving the cab a wedge shape, slightly narrower at the front than in the back and with a large radius on each front corner, has significantly reduced aerodynamic drag. Compared to previous truck generations, the drag coefficient has been diminished by up to 12 percent, thereby lowering fuel consumption.

• Carbon dioxide (CO2) arises from the burning of all fossil fuels. The result is a net increase in carbon dioxide in the atmosphere. Carbon dioxide is one of the “greenhouse gases” which are believed to cause climatic change on earth.

• Carbon dioxide (CO2) arises from the burning of all fossil fuels. The result is a net increase in carbon dioxide in the atmosphere. Carbon dioxide is one of the “greenhouse gases” which are believed to cause climatic change on earth.
Selection of materials - crucial for environmental impact

Scania’s goal is to select materials with the best functional qualities and the lowest environmental impact. For example, the new OmniCity bus is made of aluminium, which can be recycled a number of times. Aluminium is also lighter, thereby lowering gross weight and fuel consumption.

A Scania vehicle consists largely of raw materials such as steel, sheet steel and cast iron. Upholstery on the cab’s walls and roof is made of recycled fabrics from the clothing industry. All plastics are pre-marked so they can easily be sorted and recycled when a vehicle is dismantled. Environmentally hazardous materials such as mercury, bromine fire retardants and asbestos were completely removed from Scania’s vehicles several years ago.

On the other hand, lead is still used in batteries and in the balancing weights on tyres. Lead accounts for only 1 percent of a vehicle’s total material content but dominates the environmental impact of its materials. Today there is no good replacement for lead that offers both the requisite functional characteristics and a low environmental impact.

Scania vehicles less noisy than before

For many years, Scania has worked to lower vehicle noise levels. By means of new design solutions, development work, and use of new components and materials, Scania has reduced the noise level to 80 decibels (dBA). Fifteen of today’s trucks are quieter than one truck 25 years ago. In the development of the OmniCity bus, external noise levels were lowered to 77 dBA. The EU’s maximum permitted level of vehicle noise is 80 dBA.
SWITCHING TO ALTERNATIVE FUELS

Switching to alternative fuels is increasingly discussed today. The primary objective is to lower the net increase in atmospheric carbon dioxide, thereby also reducing the risk of climate changes and improving local environmental conditions.

To Scania, it is natural and essential to work on modifications of its basic engines that enable them to run on other fuels besides diesel fuel. In the future, it will be necessary to make a systemic shift from fossil fuels to renewable fuels. With minor modifications, a diesel engine can operate on several different fuels. Scania’s efforts so far have focused on ethanol, gaseous fuels such as natural gas and dimethyl ether (DME) as well as hybrid operation.

Ethanol
Ethanol is an alternative fuel that can be produced from traditional raw materials such as sugar cane and grain, but forestry waste and wine can also be employed in its manufacture. Ethanol has a lower energy content than diesel oil, resulting in higher fuel consumption. Emissions of carbon dioxide, nitrogen oxides and particulates are, however, lower when ethanol is used in place of diesel fuel.

Scania today is Europe’s largest manufacturer of ethanol-powered city buses. It has delivered nearly 200 buses to the Greater Stockholm Transport Authority (SL), which has the world’s largest fleet of ethanol-powered buses.

Gaseous fuels
Scania also develops engines modified for running on natural gas and biogas. The importance of natural gas as a fuel for vehicles is expected to increase. Today gas-powered engines are about 25 percent less efficient than diesel engines and thus consume more fuel. From an environmental standpoint, natural gas has about the same advantages as ethanol – low levels of nitrogen oxides and particulates – but like diesel fuel it generates a net increase in atmospheric carbon dioxide. So far Scania has delivered 100 natural gas-powered buses to Sydney, Australia.

DME is an attractive new diesel engine fuel with emission levels comparable to those of natural gas. It can be produced from both natural gas and renewable raw materials. Scania has initiated a project to increase its knowledge of DME.
Low demand

Today the demand for vehicles powered by alternative fuels is very low. They accounted for 0.2 percent of Scania’s total sales during the period 1991 to 1996. The main reason is that most Scania vehicles operate in long-haul traffic, for which the alternative fuel supply and distribution network is very limited.

Demand for city buses powered by alternative fuels is significantly higher, accounting for 8 percent of total city bus sales. As environmental awareness increases and distribution systems for alternative fuels expand, the demand for such vehicles is very likely to increase.

Hybrid power

To meet demands for maximal environmental adaptation of buses, for some years Scania has been involved in a hybrid bus project. A hybrid bus run on its own electrical power plant. It either operates as a purely battery-powered electrical vehicle or can be connected to a generator powered by a car engine with a catalytic converter to treat exhaust emissions.

During 1996 Scania delivered six hybrid buses to SL. The company has also delivered three buses to Luxembourg.

To meet the demand for maximum environmental adaptation of buses for city centre traffic, for some years Scania has been involved in a hybrid bus project.

Diesel fuel will remain in use

Diesel engines powered by diesel fuel will probably remain the most common alternative for heavy vehicles in long-distance haulage during the foreseeable future. This is mainly due to the superior customer benefits of diesel fuel - low price, high energy content and a well-developed distribution infrastructure.
CORRECT USE BETTER FOR THE ENVIRONMENT

To minimise a vehicle's environmental impact, optimal utilisation is important. This places stringent demands on Scania's customers in terms of driving technique, transport planning and vehicle maintenance.

Vehicle utilisation and driving technique

Efficient transport planning, high gross weights and smooth driving are preconditions for reducing a vehicle's environmental impact. Driving technique alone can affect fuel consumption by 20 to 30 percent. Scania developed the Opticruise computerised powertrain management system to facilitate long-distance driving. Used correctly, Opticruise ensures fuel efficiency and a safe driving style – the automatic control system selects the optimal gear.

During 1997, Scania will increase efforts to inform its distributors and customers about ways they can reduce the environmental impact of haulage work.

Regular maintenance

Every vehicle requires continuous maintenance to remain safe in traffic. The same is true of those systems that affect its environmental characteristics and operating economy. In developing today's trucks and buses, major resources are devoted to giving vehicles the best conceivable environmental performance, at the same time that they should operate as economically as possible. Regular maintenance ensures a vehicle's continued environmental performance throughout its service life.

Scania's service-exchange system - an environmentally friendly alternative to repairs

Scania's service-exchange system is a well-established system for reusing parts. Rather than repairing a worn-out part or
“A fast-expanding system for the reuse of parts,” explains Roger Grebesjö, who is in charge of Scania’s service-exchange operations.

buying a newly manufactured one, Scania customers can replace it with a factory-reconditioned used part – a service-exchange part. When Scania sells a new service-exchange part, it accepts the customer’s worn-out part for disposal or reuse. Some of these parts are later employed in the production of service-exchange parts. Those that cannot be reused for various reasons are dealt with in an environmentally sound, controlled way.

Scania also uses a monetary deposit system when selling service-exchange parts. Customers put down a deposit when buying new service-exchange parts, and they later receive their money back when they return worn-out parts. In this way, Scania ensures that as many worn-out parts as possible will be returned and reused, instead of ending up in landfills and scrap yards. Between 1992 and 1996, Scania’s service-exchange system sales rose by about 40 percent.

**Service-exchange system to expand during 1997**

During 1997, Scania is introducing a new system for returned parts. Until now, Scania has only allowed customers to return as many worn-out units as they had purchased in the form of service-exchange parts. Beginning in 1997, in principle Scania will offer its customers the option of returning all old worn-out parts for repurchase.

Within the framework of the service-exchange system, Scania is offering its customers in Sweden and Germany the opportunity to upgrade their engines by one or two environmental categories at a favourable price. In most cases, this involves an upgrade from Euro 1 to Euro 2 standards.
WHEN A VEHICLE REACHES THE END OF ITS SERVICE LIFE

Reuse and recycling of heavy vehicles is an area that requires major development work. Scania’s goal is to make its vehicles 100 percent recyclable.

A truck consists largely of iron, steel, copper and aluminium but also of glass, rubber, lead, zinc and various plastics. After dismantling, its constituent materials and parts can be reused or recycled in various ways. However, this requires reprocessing of residual products in the form of sorting, cleaning and/or other value-adding processes. Some materials, such as rubber, are more difficult than others to reuse but their energy can instead be recovered by means of controlled incineration. Other materials should be dealt with in environmentally acceptable ways.

Today about 90 percent of the material weight of a truck can be recycled.

Increased recycling

To facilitate a high degree of recycling, Scania’s goal is to manufacture vehicles that are 100 percent recyclable. But today there is a big gap between what can be recycled and what in fact is recycled. The main challenge is to build up systems and structures that increase the actual degree of recycling.

About 90 percent of a truck can be recycled*

*The figures refer solely to recycling of materials, not energy.

<table>
<thead>
<tr>
<th>Recyclable portion, kg</th>
<th>Non-recyclable portion, kg</th>
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<tbody>
<tr>
<td>Glass</td>
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<tr>
<td>Paint</td>
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<tr>
<td>Copper/brass/bronze/zinc</td>
<td>39</td>
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<tr>
<td>Lead</td>
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<tr>
<td>Plastics</td>
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<tr>
<td>Aluminium</td>
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<tr>
<td>Rubber</td>
<td>44</td>
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<tr>
<td>Steel and cast iron</td>
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ENVIRONMENT AND ECONOMICS

To Scania, there is no conflict between environmental responsibility and industrial growth. The intensifying use of more efficient production methods has not only resulted in competitive advantages but has also generated major environmental advances.

So far Scania has been able to measure its environmental progress mainly in terms of lower inputs of electricity, water etc. and lower emission levels. In the future, it will also be able to report the economic results of its environmental work. Scania is now studying various possibilities for developing an internal reporting structure that will better enable it to track and describe its environmentally-related investments, expenses and revenue.

### HIGHLIGHTS OF 1996 OPERATIONS

**Amounts in SEK million unless otherwise indicated**

<table>
<thead>
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<th>Sales, units</th>
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<td>Trucks</td>
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<td>Buses</td>
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<tr>
<td>Svenska Volkswagen products</td>
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<tr>
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<td>Total</td>
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<td>Earnings per share according to U.S. GAAP</td>
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<td>on shareholders’ equity</td>
<td>23.1%</td>
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<tr>
<td>on capital employed</td>
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<tr>
<td>on capital employed excluding customer finance operations</td>
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<table>
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<tr>
<th>Debt/equity ratio</th>
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<tr>
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<td>0.65</td>
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<table>
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<th>Equity/assets ratio</th>
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<td>27.7%</td>
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<table>
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<th>Capital expenditures for property, plant and equipment</th>
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<tr>
<th>Research and development expenses</th>
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GOALS FOR 1997

By the end of 1997:

- Initial environmental reviews within the framework of ISO 14001 shall have been completed at all Scania facilities.
- An even larger number of Scania employees shall have undergone environmental training.
- A checklist for assessing the environmental work of suppliers and contractors shall have been compiled and fully implemented.
- Employees at all production units shall have undergone LCC training.
- Internal reporting systems for raw material flows, electricity, water etc. shall have been supplemented.
- An energy audit within the framework of the EKO energy project shall have been implemented at most Swedish production units.

- Steps shall have been taken to further reduce energy use per vehicle.
- Steps shall have been taken to further reduce consumption of solvent-based paints.
- Informational activities for distributors and customers on the correct use of vehicles shall have continued.
- The task of writing instructions for the dismantling of all vehicles at the end of their service lives shall have begun.
- Systems for reporting environmentally-related investments, expenses and revenue shall have been created.
Glossary and Explanations

A
Acidification
A chemical change in nature whereby the acidity of soil and water increases (the pH value drops). One source of the discharge of acidity/acidifying compounds into the atmosphere is the burning of fossil fuels, primarily sulphur and nitrogen oxides which form sulphuric acid and nitric acid respectively, in the combustion of coal or petroleum. The weathering of rocks also contributes to this process, but is not significant in comparison to the burning of fossil fuels. Acidification is a more important role in acidification.

Agenda 21
An action programme for the 21st century aimed at achieving ecologically, socially and economically sustainable development. Created in conjunction with the UN Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil in 1992.

Alcohols
Organic chemical substances which contain one or more hydroxyl groups (oxygen, hydrogen, OH) bound to carbon atoms. Alcohols are produced industrially through a process of fermentation and are, amongst other things, used as an engine fuel.

Aldehydes
Partially oxidised hydrocarbons (HC) which are toxic to some extent to the unpleasant smell of diesel exhaust gases. The aldehyde content of exhaust gases can be reduced to an insignificant value by using a catalytic converter.

Alkaline baths
Degreasers containing solutions of metals.

Alternative fuels
Fuels other than petrol that do not contain petrol or diesel fuel. Alternative fuels which can be used in diesel engines include vegetable oils, for example, arachis (peanut), soy, canola and rapeseed oils. These are used in liquid form as solvents and refrigerants, and in gaseous form in spray-cans and for manufacturing cellular plastic foam.

Benzene
Hydrocarbon with six carbon atoms and six hydrogen atoms. In combustion, it gives rise to soot and polycyclic aromatic hydrocarbons (PAH).

Biofuel
Renewable fuel obtained from biomass, i.e. substances produced by living organisms, for example, wood, straw, or in refined form such as ethanol, methanol, or dimethyl ether.

Carbon (CO) 2
A colourless gas formed by all forms of combustion and by the decomposition of organic material. Carbon dioxide contributes to the greenhouse effect, and its emission, i.e. the increase of CO2 in the atmosphere, is lower if renewable fuels are used.

Carbon monoxide (CO)
A toxic gas formed through incomplete combustion of carbon and carbon compounds swelling to an inadequate air supply. In contact with air, it is quickly converted to carbon dioxide. The gas is toxic because it deprives the tissues of oxygen in the blood supply's haemoglobin, thus preventing the distribution of oxygen inside the human body.

Carcinogen
A substance which causes cancer. See under heavy metals.

Catalytic converter
A catalyst is a substance which hastens a chemical process without itself being consumed. Catalytic converters in passenger cars use precious metals such as platinum. Diesel engines use oxidising catalytic converters which are basically the same as those used in petrol-powered vehicles. Due to the considerable surplus of air and thus also the high oxygen content in diesel exhaust gases, nitrogen oxides (NOx) cannot be reduced in catalytic converters, and a different method must be used (see nitrogen oxides). The catalytic converter oxidises - incinerates - gaseous and liquid substances, including hydrocarbons (HC) present in exhaust gases. The catalytic converter substantially reduces both hydrocarbon and carbon monoxide (CO) content, and most of the typical diesel exhaust smell disappears. A low-sulphur fuel minimally reduces the emission of sulphuric acid in the catalytic converter at high exhaust gas temperatures.

Cetane rating
Specifies the ignition properties of fuels for different engines (cf. octane rating for petrol engines).

CFC
Chlorofluorocarbons.

Chlorofluorocarbons (CFCs)
Hydrocarbons containing both chlorine and fluorine. These are used in liquid form as solvents and refrigerants, and in gaseous form in spray-cans and for manufacturing cellular plastic foam.

CNG
Compressed Natural Gas.

Diesel fuel
Petrol-based fuel derived from crude oil. Diesel oils of various quality can be extracted depending on the degree of refinement and after-treatment.

Dioxin
The most common type of diesel fuel.

Drag (aerodynamic resistance)
A vehicle body designed to reduce drag as much as possible in reducing fuel consumption and lowering exhaust emissions from the engine.

E
Ecological
Discharge of air pollutants calculated per kilometre for each type of transported goods.

Efficiency rating
The ratio between the energy released and the energy used, expressed as a percentage. The efficiency rating of a diesel engine may be as high as 46 percent, compared to 30–35 percent for a petrol engine.

EMS
Eco-management and Audit Scheme. An EU scheme under which companies can certify their facilities. The aim is to stimulate companies to further develop their environmental policy in a systematic and uniform manner. Participation in EMS is voluntary, but companies that become certified can obtain certain advantages.

Emissions
Discussion of chemical matter or energy to the surrounding environment, for example air pollution.

Emissions per tonne-km
Discharge of air pollutants calculated per kilometre for each type of transported goods.

Engine variation
Conversion of fuels made to an engine so it can run on alternative fuels, for example switching from diesel to natural gas.

Essence
Chemical reaction when an ester is formed. See under esters.

Ester
Organic compounds formed through reaction between an acid and an alcohol with elimination of water.

Ethanol
An alcohol produced through fermentation of biological material containing sugar or produced synthetically within the oil industry. Ethanol can be used as engine fuel if necessary engine modifications are carried out. Compared with petroleum-based fuels, ethanol produced from biomass can offer substantial environmental benefits.

Euro 1 and 2
Economic regulation and standards for truck and buses within the EU.

F
Fuels
Content or industry.

Fumes
Trade name for chlorofluorocarbons (CFCs).

G
Gas
Biogas or digestor gases consists primarily of methane. Digestor dudge from sewage treatment plants is one source of biogas. Other sources are refuse dumps and digestor plants for organic materials from agriculture or industry.

CNG - Compressed Natural Gas
The composition of this gas varies in different geographical areas. Natural gas contains more than 90 percent methane.

LNG - Liquefied Natural Gas
Another form of natural gas which must be stored at very low temperature. LNG is therefore more common for practical reasons.

LP-G - Liquefied Petroleum Gas
LP-G consists primarily of propane and propylene butane. The gas that is most common in Sweden contains 90-95 percent propane and the remainder is made up of butane, propylene and butyl.

Glue plug
An electrically heated plug inside the combustion chamber of an engine. The glue plug assist in cold starts by heating the fuel.

Greenhouse effect
Incoming solar radiation is prevented from reflecting back to space by gases in the atmosphere, which act just like the glass panels in a greenhouse. This effect is essential for life on earth. However, certain human activities have led to an increase in proportion of such gases, in the atmosphere, for instance through the discharge of carbon dioxide from burning fossil fuels, which reinforces the greenhouse effect.

Gross weight
Maximum permitted weight for vehicle and load.

H
Heat coefficient
The amount of heat obtained from complete incineration of a specific quantity of a specified substance.

Heavy metal
Metals with a density (see above) in excess of 4.5 g/cm3, e.g. mercury, copper, cadmium, lead, nickel and chromium. Most heavy metals are toxic but some of them are essential to human life.

Hydrocarbons (HC)
Organic compounds in exhaust emissions composed mainly of unburned fuel. They have an unpleasant smell and are suspected of representing a health hazard.

Hydrogen gas
Hydrogen in gaseous form. A very light, weightless gas, without colour or odour.

Injection pump
Injection pump and injectors, designed to inject fuel at high-pressure system consisting of an injection pump and injectors.

Injection system
A diesel engine must be equipped with a high-pressure system consisting of an injection pump and injectors, designed to inject the fuel into the compressed air in the cylinder.

Injection
The part of the fuel injection system which...
injects the fuel into the cylinder. It may have a differing number of holes to obtain the appropriate fuel distribution pattern. Multi-hole-fuel distribution and smaller droplet size, resulting in more complete combustion of the fuel.

ISO 14001

A standard for environmental management within the ISO 14000 series, ISO 14001 is international standardisation which states that a company’s environmental work is of a certain quality. In general, a company that is certified in accordance with ISO 14001 has conducted a periodical environmental audit and publishes an approved environmental report as soon as it meets the ISO 14001 standard regulations. An ISO 14001 certification is valid for an entire company.

Long CO₂ cycle

The carbon life-cycle which covers fossil fuels. Carbon dioxide is released into the atmosphere during combustion. The long CO₂ cycle is the short CO₂ cycle and when dead organisms decompose, this CO₂ is bound in living plants. By burning fossil fuels, CO₂ is added to the atmosphere in excess of what is included in the short CO₂ cycle. Carbon dioxide which cannot be used up but which constitutes a net surplus and thus contributes to the accelerating greenhouse effect.

Methane

A colourless and odourless gas which is formed in various ways, for instance through the decomposition of plants in anoxic environments and from waste in refuse dumps. Methane is also the principle component in natural gas. In addition, methanol is classified as one of the so-called greenhouse gases.

Methanol

An alcohol (methyl alcohol) which is made through dry distillation of wood and other means, and which can be used as an alternative fuel.

Natural gas

Gas found in the earth’s crust and consisting primarily of methane. Natural gas is a fossil fuel and is produced together with petroleum (see CNG).

Nitrogen (N)

Nitrogen is found in the air (78 percent by volume) primarily in the form of diatomic nitrogen (N₂) and in the earth’s crust in the form of nitrates and ammonium compounds. In lakes and seas, nitrogen is found as a solute (N₂) and in the form of nitrate, nitrite and ammonium salts. Nitrogen is essential to all life and is also found in proteins. It is part of a complicated natural cycle involving the air, soil, water, plants and animals. Various human activities, among other things, increasingly intensive agriculture and forestry and the burning of fossil fuels, have interfered with this natural cycle and led to an increased concentration of nitrogen in lakes and seas (see Over-fertilisation).

Nitrogen oxides (NOₓ)

Chemical compounds of oxygen and nitrogen. Form the environmental viewpoint, the most important are nitrogen dioxide (NO₂), nitrogen monoxide (NO) and nitrogen dioxide (N₂O). The nitrogen oxides are formed by combustion and over-fertilisation of soil and water. In the Otto diesel engine, it is possible to reduce the content of nitrogen oxides in exhaust gases by modifying the combustion of fuel in the engine. This effect can be achieved by the traditional method of using catalytic converters.

N oxide

Unpleasant smell. Traffic vehicles is one of the biggest sources of background noise in society today.

NOx (see Nitrogen oxides.)

Olfactory plants

Common designation for plants whose seeds contain yield oil, for example rape seed (canola).

Operational range

The extent over which a vehicle can travel depends on its fuel supply.

Organic solvents

Solvents containing carbon. They dissolve oil, grease and other substances which are not soluble in water.

Otto cycle engine

Usually known as the petrol engine. It features an electric ignition system and spark plugs which ignite the mixture of fuel and air. The Otto cycle engine is most commonly used in automobiles.

Over fertilisation - Eutrophication

In the diesel engine, it is possible to coat the filter with a special catalytic coating which catalyses the conversion of fuel. By filtering the exhaust gases through a catalytic converter, which also removes the unpleasant diesel odour.

Patrol

A mountain of hydrocarbons. The most common fuel used for Otto cycle engines.

Petrol

Vegetable esters

Vegetable esters are produced from vegetable oils and waste cooking oil. They have a high cetane number, low density, viscosity, cetane rating etc.

Photocatalytic hydrocarbons (PAH)

Polycyclic aromatic hydrocarbons (PAH) are divided into two categories and are bound to the soot particles in the exhaust gases from diesel engines. Tests on animals have shown them to be mutagenic (i.e. they cause genetic changes) and carcinogenic (i.e. they give rise to cancer).

Powder painting

Painting process using paint in powder form. The colour pigment, hardener and other components are atomised but unlike other paints this type contains no solvents. There are various methods of applying this paint. In dip coating, the material to be painted is preheated and dipped in a mixture of powder and air, whereupon the paint melts onto the surface. In the frictional charge system, the powder particles are electrostatically charged and the paint is applied to the surface using a spray gun. An electric field is created between the pistol and the earthed material, and the paint sticks to the surface. The material is then heated and the paint melts to form a smooth, uniform surface.

Rapseed oil - canola oil

Vegetable oil which can be used as a fuel for engines.

Recycling

Utilizing waste and other residual products. In terms of the conversion of a residual product, recycling can be divided into reuse, material recycling and energy extraction. Recycling may occur in several stages of the waste management process.

Refining

Improving crude oil through the "cracking" process.

Reformulated diesel fuel

Diesel fuel which has been subjected to a chemical process to improve its composition by desulphurisation and de-nitrification. This process results in a fuel with lower harmful emissions.

Refrigerants

The operating agent in cooling systems such as refrigerators and air conditioning units. It can absorb, transport and release heat by alternating between liquid and gas form.

FCCs (fin, cools, sees) and ammonia are some of the agents used as refrigerants. O11 type of refrigerants contribute considerably to the greenhouse effect as the ozone layer in the higher reaches of our atmosphere. Modern air conditioners use so-called “soft” CFCs which are less reactive which is therefore less destructive to the ozone layer.

Return packaging

Packaging materials which, when emptied, can be returned to be reused, for example the Euro-pallet.

Ruse

Recycling a product in its existing condition by utilising its qualities, form, function and performance. It is the product of the package and the returnable packaging. It consists of returnable parts for other products.

Rolling resistance

Energy is used up when a wheel rolls across a surface, in the form of tyre deformation and surface resilience. This, together with friction in the wheel bearings, adds up to rolling resistance. Rolling resistance has been considerably reduced in recent years owing to immense progress in tyre design and other areas.

Solvants

Substances which are used to dissolve other materials. Can be water-based in certain cases. However, from the health and environmental viewpoint, the organic solvents are worthy of more attention. They can dissolve oil, grease and other substances which cannot be removed with water and they contain volatile organic compounds (see below).

Soot

Finely ground coal which is formed owing to the incomplete combustion of organic substances.

Sulphur (S)

A chemical element which is found in fossil fuels and other sources. The content in crude oil, for example, varies depending partly on the conditions under which oil was formed and partly on the degree of desulphurisation in the refining process. The discharge of sulphur from burning of fossil fuels is the main cause of soil and water acidification. If the sulphur content of the fuel is reduced, so too is the emission rate during burning. Sulphuric acid

A product in the combustion of sulphur.

Transmission

The components which transfer the power produced by the engine to the driving wheels.

Transport work

Measures or a quantity of goods transported over a certain distance. This is expressed in units of tonne-kilometre.

UF concentrate

Ultrafiltration concentrate. Waste oil from the treatment of washing fluids and cutting emulsions.

Vegetable esters

In their original form, vegetable oils have limited use as engine fuels owing to their density, viscosity, cetane rating etc. However, if they undergo esterification, they take on characteristics similar to those of diesel fuel. Rapseed oil methyl ester is just such a product which is demonstrating promisingly as an alternative fuel.

Volatile Organic Compounds

Atmospheric emissions. Volatile organic compounds (VOCs) are those products, which evaporate into the air as a gas at room temperature. They are sometimes known as hydrocarbons but in addition to carbon and hydrogen, they also contain other substances such as chlorine and oxygen. Emissions of VOC contribute to the formation of ozone and other photochemical oxidants at ground level. Certain VOCs are carcinogenic.

Waste oil

A substance that collects as a result of machinery maintenance, oil separators etc.

Water-based paint

Paints and varnishes which use water as a solvent and diluting agent.
Scania’s Environmental Report can be ordered from:
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