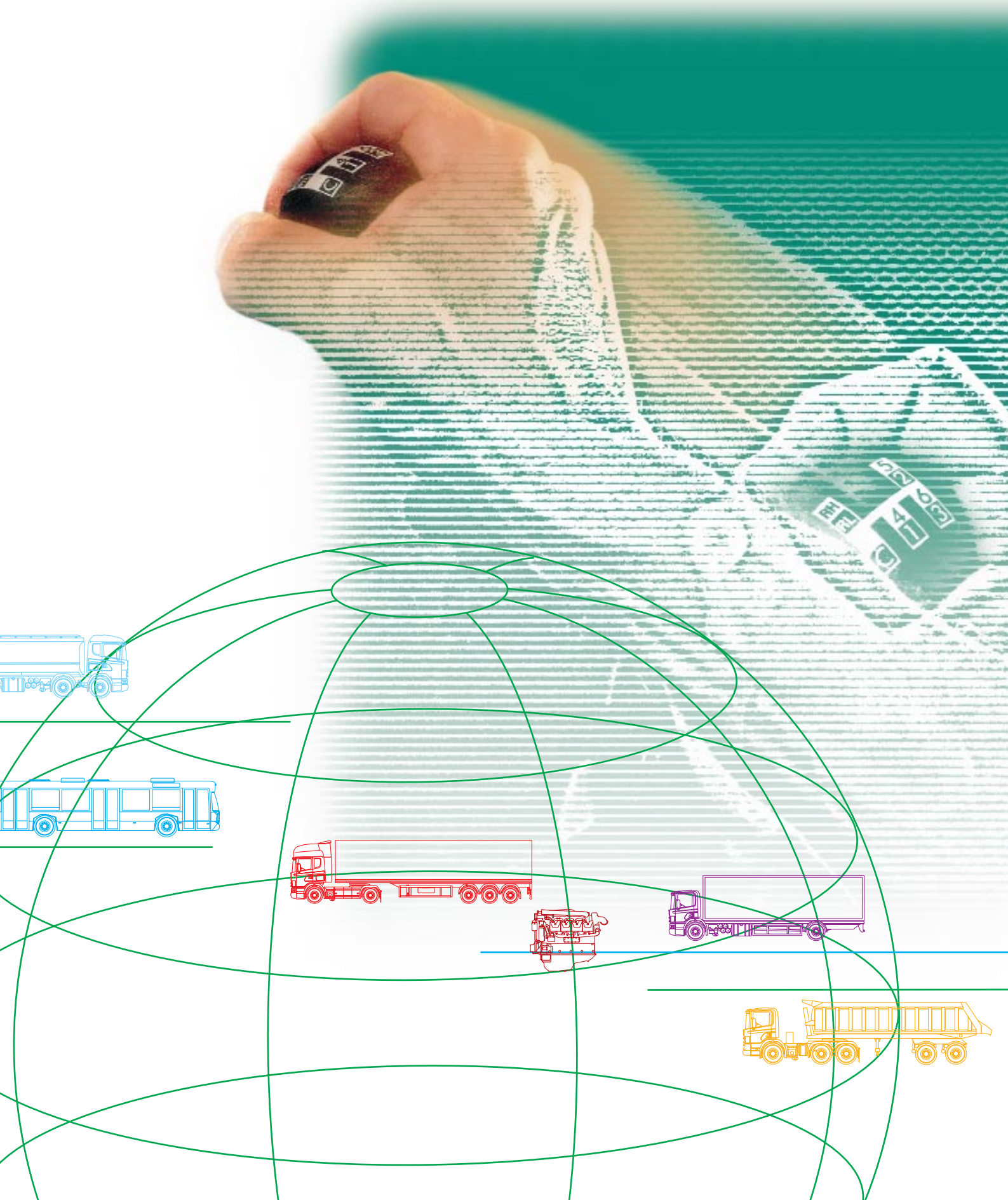
ENVIRONMENTAL REPORT SCANIA 1997



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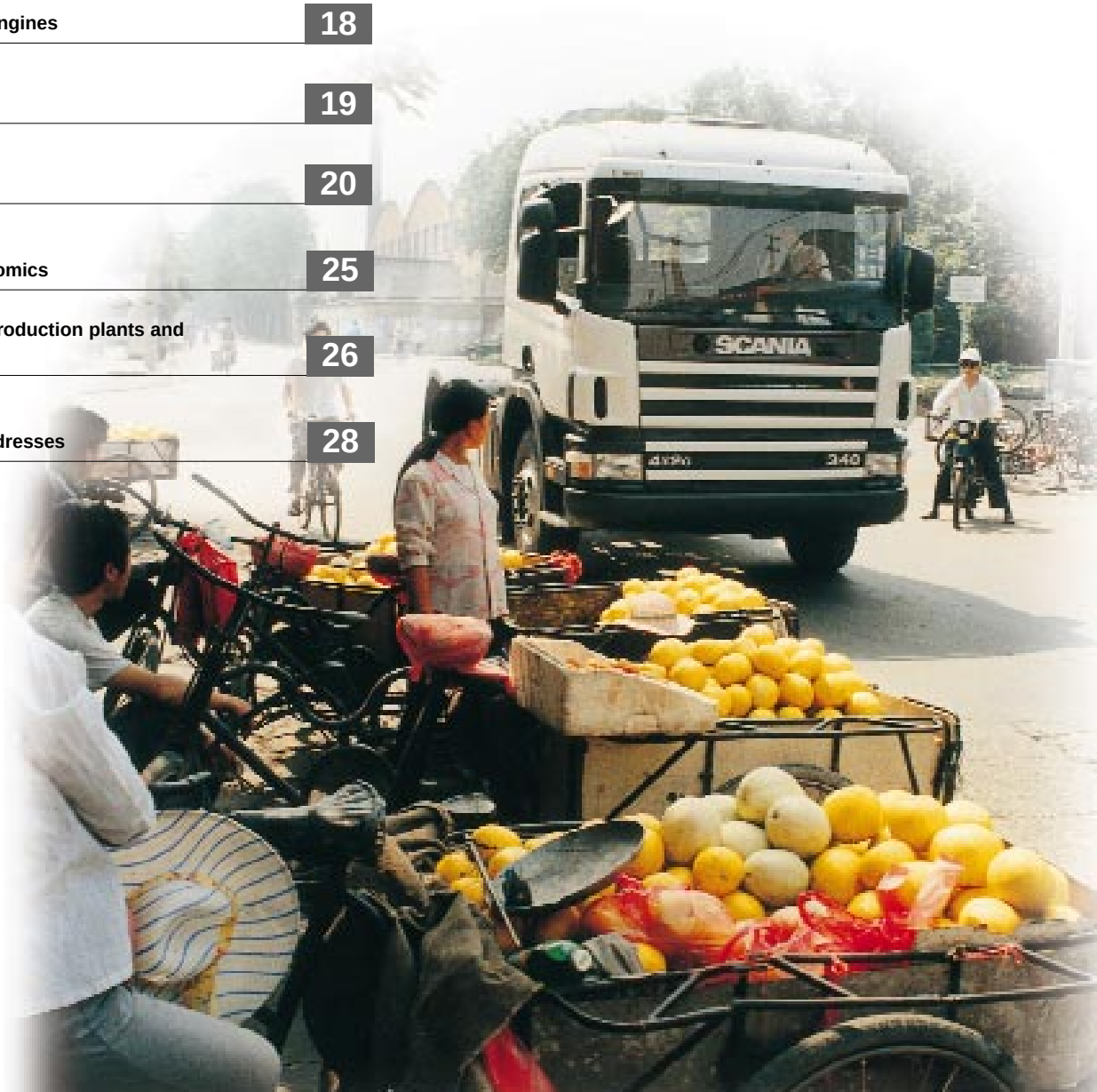


STATEMENT OF THE PRESIDENT AND CEO

Scania operates in a global market. Wherever we have production plants and wherever our trucks, buses and engines are found, we are meeting the transport needs of society. But we are also contributing to traffic-related problems such as crowding and pollution. Global activities require global environmental responsibility. The more efficient our manufacturing becomes, the less raw materials, energy and chemicals we need to use. And the less fuel our vehicles require in order to transport goods and people, the better this is for our cities and for nature.

But the environmental issues that affect us most closely and immediately are not the only ones demanding our attention. We must also involve ourselves in the large, overarching issues. This is why Scania participated, for example, in the Business Environment Roundtable on Global Change and Transportation, which took place before the 1997 UN climate change conference in Kyoto, Japan. It is why we are taking part in the discussion of tomorrow's infrastructure in the European Union (EU).

Nineteen ninety-seven was an intensive year. We witnessed even tougher competition in what is now an almost totally deregulated, increasingly service-oriented market. Meanwhile since 1995, Scania has implemented the most extensive product and production changeover in its history. In 1997, our European bus and bus chassis production units converted to the 4-series. We also made preparations to convert our manufacturing units in Latin America to the new product range. The changeover will be completed during the first half of 1998.

Parallel with this, we have intensified our environmental work. Scania's plants in Latin America received ISO 14001 environmental management certification during

1997. More Scania employees underwent environmental training. We launched new engines with better environmental performance. We continued to implement further step-by-step environmental improvements at our production plants. When the changeover to the 4-series has been completed, we will achieve the same level of environmental performance worldwide, both in our production system and our products.

Along with the continued introduction of a Group-wide environmental management system, this will further enhance the effectiveness of our environmental work.

Södertälje, Sweden, April 1998

Leif Östling
President and CEO

SCANIA TODAY

Scania is one of the world's leading manufacturers of trucks and buses. It is the fourth-largest heavy truck make in the global market, and the third largest in Europe. Scania is the fourth-largest bus make in the world.

Scania has been manufacturing heavy vehicles for nearly a century. Today the company can offer its customers an overall commitment that, aside from the vehicle, may include everything from parts to a fixed price per kilometre. Scania is entering the 21st century with a new generation of trucks and buses, the 4-series.

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 distribution points and 1,500 service workshops. During 1997, the largest markets for Scania trucks were Brazil, Great Britain, Germany, France and the Netherlands, and for buses Brazil, Egypt and Spain.

Scania was founded in 1891. The company built its first truck in 1902 and its first bus in 1911.

The company has production facilities in eight European and Latin American countries: Sweden, Denmark, France, the Netherlands, Poland, Brazil, Argentina and Mexico. In addition, there are assembly plants in about a dozen more countries.

At the close of 1997, Scania had about 23,800 employees worldwide.

Research and development work is concentrated in Sweden.

Scania's products

Scania manufactures 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.

The Scania bus and coach range consists of fully built city and inter-city buses as well as bus chassis for more than 30 passengers, intended for urban operation and inter-city traffic or as tourist coaches.

Scania's industrial and marine engines are used as power plants 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 AB, which is the Swedish importer for Volkswagen, Audi, Seat, Skoda and Porsche.

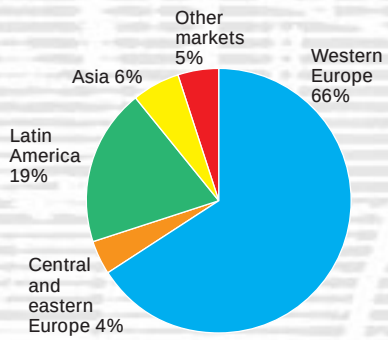
Scania's strengths

Scania vehicles can be tailored to each customer. These vehicles have a long service life and low operating costs, thereby creating Scania's position as a high-quality make. Scania's success is based on:

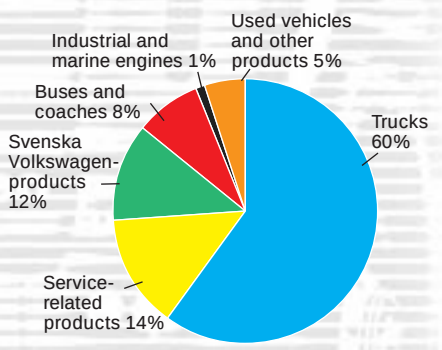
- Its concentration on heavy vehicles designed for the transport of goods and passengers
- A modular product system and a global production system
- Maintenance and repairs, parts and various services as an integral element of operations
- A focus on growth markets

Scania is represented in about 100 countries. Its production plants are located in eight countries in Europe and Latin America. Research and development work is concentrated in Sweden.

Sales by market area, 1997
Scania products



Sales by product category, 1997



MORE EFFICIENT TRANSPORT WORK IN A GROWING MARKET

Transport work is essential for a functioning society, but at the same time it constitutes an environmental problem. A vehicle's environmental characteristics are therefore becoming an increasingly important competitive factor.

As trade increases, so does the need to transport goods and passengers. The quantity of transport work is increasing. Higher standards of functionality, speed and delivery assurance are expected. Trains, boats, aircraft, buses and trucks are all necessary elements of a functioning global transport system. By improving their efficiency, both separately and in combination with each other, it is possible to minimise their environmental impact.

Today a company in the transport business can make its operations more cost-effective by selecting vehicles with a high standard of environmental performance. Customers are increasingly selecting manufacturers that can supply vehicles that have low fuel consumption, exhaust emissions and noise levels and facilitate the recycling and reuse of materials.

Developing vehicles with lower fuel consumption

Most Scania vehicles are equipped with engines that run on diesel fuel. The Scania product range undergoes continuous refinements aimed at improving vehicle cost-effectiveness and environmental performance.

Intensive research and development work, and changes in public infrastructure, have cut fuel consumption for a given transport task by around 60 percent over a 25-year period. Today a haulier needs less than half as much fuel to transport the same quantity of goods. Scania's new 11- and 12-litre engines have been designed to cut fuel consumption even further.

Customers in almost all of Scania's markets are demanding vehicles that comply with the EU's Euro 2 requirements on exhaust emissions. This also applies to markets outside Europe where legal requirements are not as strict. For example,

Good environmental performance and economical operation are musts for Scania's customers.

during 1997 Scania delivered 30 city buses with Euro 2 engines to Argentina and received an order from there for 50 rubbish trucks with Euro 2 engines.

Alternative fuels

Interest in vehicles powered by alternative fuels has increased in Scania's markets in Europe and Latin America. This is especially true of vehicles intended for urban operation, that is, city buses and distribution trucks. Vehicles using alternative fuels generally emit less carbon dioxide, nitrogen oxide and particulates than those using diesel fuel (see pages 16–17). In terms of volume, however, demand for this type of vehicle remains small, mainly because the alternative fuel supply infrastructure is poorly developed. Today vehicles powered by alternative fuels account for less than one half percent of Scania's total sales. In the urban vehicle segment, the 1997 figure was around 13 percent (1996: 8 percent).

Scania's sales of buses powered by alternative fuels

Type of fuel	Total units sold	Units sold 1997
Gaseous fuels		
CNG	**110**	–
LPG	**196**	145
Ethanol	**325**	40
Hybrid	**14**	–

In Brazil and Argentina, where there are ample supplies of ethanol and gaseous fuels, respectively, and where environmental standards have been tightened, there is great potential for vehicles powered by alternative fuels. In 1997, two Scania city buses were used when Brazil tested ethanol-powered buses for the first time.

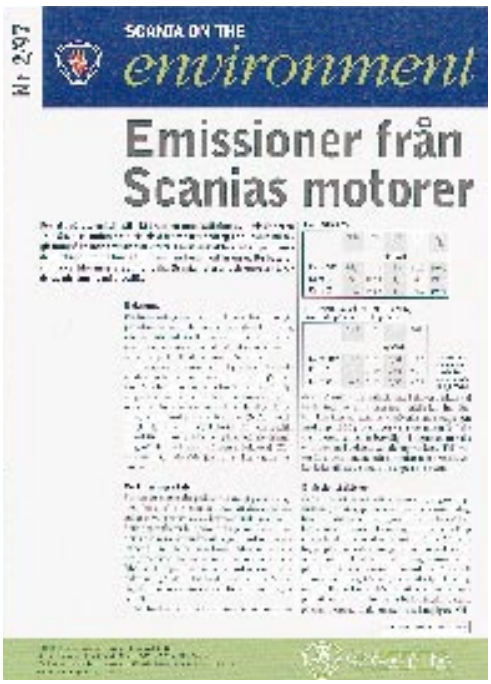
During 1997, Scania sold an additional 40 ethanol buses to the Greater Stockholm Transport Authority (SL), which has the world's largest fleet of ethanol-powered buses. Scania sold 145 liquefied petroleum gas (LPG) powered buses in Denmark and the Netherlands. At year-end the company delivered its first biogas-powered truck to the City of Stockholm.

The demand for information and greater openness

During 1997, Scania noted a greater demand for information on the environmental characteristics of vehicles. Its own customers and their customers, especially in Europe, are requesting information on fuel efficiency, exhaust and noise emissions, noise levels, recyclability and material contents. This is largely because more and more companies are introducing environmental management systems in accordance with ISO 14001 international environmental management standards and the Eco-Management and Audit Scheme (EMAS) of the European Union. These systems require better monitoring of the environmental impact of transport work.

Scania was the first heavy vehicle manufacturer to present a compilation of vehicle emission factors, stating the quantity of emissions in relation to the quantity of spent fuel and enabling Scania customers to estimate the environmental impact of a given transport task.

Scania is working together with its suppliers to develop environmental declarations for all its products.



In response to customer interest, Scania has prepared a description of a vehicle's "emission factors".

Future legal requirements

In 1997 the Swedish Parliament approved stricter information requirements for company environmental work. The law goes into effect during a company's first financial year after December 31, 1998. It stipulates that the Report of the Directors section in a company's annual report must also contain environmental information. Scania has provided environmental information in its annual report since 1996.

During 1997 the EU discussed a number of legislative issues affecting the vehicle manufacturing industry. Stricter rules on fuel quality and on emissions from vehicles used in heavy transport work can be expected.

New fuel specifications will require reductions in levels of sulphur, aromatics and other substances in diesel fuel from the year 2000. Scania welcomes this. Cleaner fuel has an immediate favourable effect on emissions from all vehicles, regardless of their model year, and facilitates continued

Extensive work to improve European air quality is underway in the European Union. Scania is participating actively in preparatory work to ensure compliance with future directives containing stricter exhaust rules for heavy vehicles.

engine development work. The introduction of Environmental Class 1 diesel fuel in Sweden has demonstrated this.

A proposal for an EU directive on emissions from heavy transport vehicles was presented in December. New emissions limits (Euro 3 rules) and testing methods will apply to newly-introduced vehicle models and engine types starting in the year 2000, and to all newly-registered vehicles and engines from the year 2001.

The same proposal also announces plans for a future directive on Enhanced Environmental Vehicles (EEV), that is vehicles especially adapted to inner city traffic, featuring extra low emission levels. On a voluntary basis, vehicle manufacturers will be able to certify an EEV using the same procedures as for conventional vehicles.

During 1997, the European Commission began preparatory work for the establishment of Euro 4 rules, which will take effect from the year 2005. Scania and other European vehicle makers, EU member states and environmental organisations are participating in this work.

SCANIA'S ENVIRONMENTAL STRATEGY

Scania shall be a market leader in terms of a vehicle's environmental characteristics and shall take steps to ensure that its production system consumes the least resources and uses the most efficient methods 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.

Scania's Environmental Policy

Environment concern is of vital importance to Scania's long-term development and profitability.

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

This means that Scania shall:

- allocate sufficient resources for active environmental work.
- integrate environmental issues throughout its operations.
- establish an environmental management system that ensures continuous learning and continuous improvements.

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

This means that Scania shall:

- pursue development work aimed at preventing environmental impact.
- reduce the quantities of materials used and select more environmentally sound materials.
- improve vehicle fuel efficiency.
- use resources more efficiently in its production processes.
- increase recycling and decrease quantities of waste.
- encourage vehicle users to think more environmentally.

3 Scania shall actively promote internationally harmonised and effective environmental legislation – for Scania current legislation is the minimum standard.

This means that Scania shall:

- continuously engage in a dialogue with public authorities, customers and other interested parties.
- strive to perform above the standards required by law where this is economically feasible.

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

This means that Scania shall:

- actively engage in a dialogue with customers, public authorities and the general public on the environmental impact of both its production system and products.
- publish a separate annual Environmental Report.

Scania's environmental policy constitutes the foundation and framework of its environmental goals and thereby also indicates the direction of its environmental work. In

its annual Environmental Report, Scania follows up its environmental goals and thereby also the commitments stated in its environmental policy (see page 11).

In its current form, Scania's environmental policy was adopted in July 1996. It reflects the company's mission, as a vehicle manufacturer, to develop vehicles with the best transport economy and the lowest environmental impact.

Environmental management system

As part of its comprehensive environmental strategy, Scania is introducing an environmental management system that fulfils ISO 14001 international standards. This task began in 1995 and continued during 1997. During the year, operations in Brazil, Argentina and Mexico were third party certified. All Scania units in Latin America have thus received ISO 14001 certification. The goal is to obtain certification for Scania's European operations during 1998.

Scania's efforts to systematise environmental issues by implementing an environmental management system have proved to be a good complement to its other improvement work. Initial studies have already identified a number of potential improvements, for example in the areas of energy, waste and chemicals.

During 1997, other Scania departments besides the production plants – product development, purchasing, logistics and marketing units – have also begun the task of introducing an environmental management system. The marketing organisation has conducted a pilot project to create a model for environmental management at Scania's distributors.

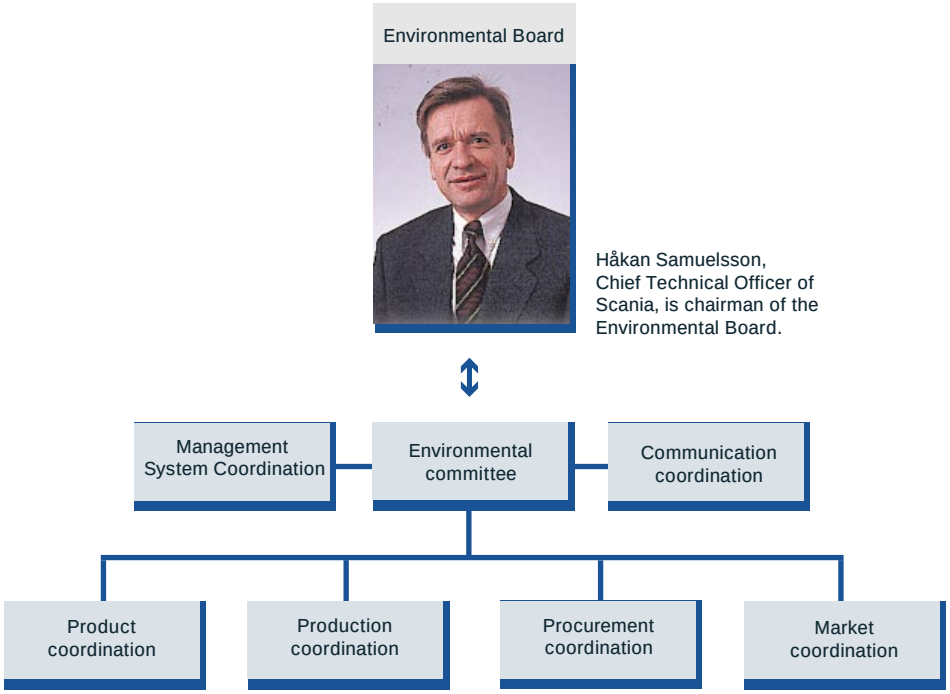
Scania's ISO 14001 certificate for its Brazilian plant.

Taking a break from certification work at the plant in Tucumán, Argentina. A working group from Scania has just completed an audit round with representatives of the American Bureau of Shipping, which issues the environmental management certificate.

Environmental training

In conjunction with the introduction of an environmental management system, Scania employees are receiving environmental training. Employee commitment is crucial if environmental work is to gain a foothold and permeate the entire organisation. Environmental training continued in 1997, and around 20 percent of Scania employees have now completed the basic program. In Latin America, more than 90 percent of employees have been environmentally trained.

During the year, additional employees received Life Cycle Cost (LCC) training.



Environmental network

During 1997, Scania reorganised its environmental network with an aim of more clearly defining the various areas of responsibility and hastening the process of fully integrating environmental work into the line organisation.

Overall responsibility for environmental work rests with Scania's Environmental Board, which represents the Executive Management. The Environmental Committee, which coordinates environmental work at the Group level, reports to the Environmental Board. All line managers, in turn, are responsible for environmental work in their respective operations.

Together with coordinators from the line organisation, Management System Coordination oversees the introduction of Scania's environmental management system.

In order to monitor and follow up internal environmental work, Scania also has a number of internal environmental auditors. They audit Scania's environmental work and train environmental auditors at the various line organisations.

Scania's environmental goals

Scania has adopted detailed goals that make its environmental policy more concrete and serve as benchmarks of its environmental work.

Environmental goals for 1997	Fulfilment of goals
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 dismantling 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.	

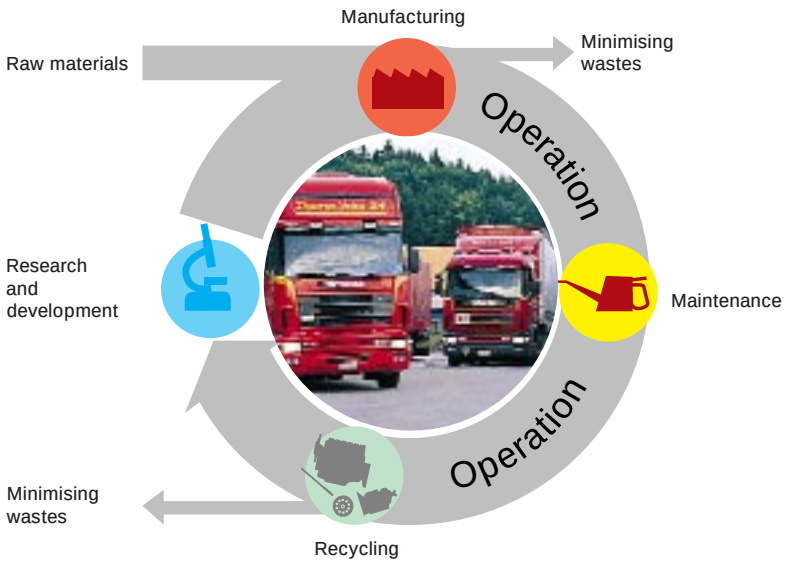
Environmental goals for 1998
• All Scania industrial operations shall implement environmental management systems and obtain ISO 14001 certification.
• The degree of present material and component recycling in Scania trucks shall be evaluated.
• A list of specially restricted materials and chemicals used in Scania's products and production shall be available.
• A guide for environmentally sound use and maintenance of Scania's products shall be available.
• Guidelines on introducing environmental management systems at Scania's repair and service workshops shall be published.
• Environmental product declarations for Scania's trucks shall be available.
• All regular suppliers and contractors shall be informed of Scania's environmental demands.
• Environmental evaluations of 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.

RESEARCH AND DEVELOPMENT

Scania works continuously on improvements aimed at reducing the environmental impact of its products throughout their life cycle.

Scania endeavours to integrate its environmental thinking with product development from the start, by applying a Product Development Management (PDM) system. Besides engaging in engine development, Scania must select materials and manufacturing processes that have a minimal environmental impact and adapt its design process to facilitate recycling. Future vehicles must be lighter, contain fewer hazardous materials and emit fewer toxic substances.

Seeing a product from a life cycle perspective is about doing things right from the beginning. The biggest environmental impact, more than 90 percent, occurs during a vehicle's service life.



Scania's research and development work is concentrated in Södertälje, Sweden. During 1997, Scania invested SEK 1,169 M (1,084) in research and development.

The company's engine development work focuses mainly on improving traditional diesel technology and making it more efficient. Continuous development work is needed to further reduce the environmental impact of diesel engines, primarily by lowering nitrogen oxide emissions while reducing fuel consumption. Better control of the combustion process and catalytic conversion of gaseous emissions are among Scania's R&D priorities.

Material selection, vehicle weight, aerodynamic drag and rolling resistance as well as noise levels are other important areas of development for Scania vehicles.

Scania is developing engines that run on alternative fuels, primarily for vehicles intended for urban operation. These efforts focus on vehicles that burn ethanol and gaseous fuels or employ hybrid power systems.

Cooperation with institutes of technology and universities

Cooperation with institutes of technology and universities is an important part of Scania's R&D work. It develops and ensures a skills base in strategic areas and enables Scania to initiate research and benefit from research findings.

During 1997, Scania invested around SEK 15 M in specific environmentally-related research projects at various institutes of technology and other higher educational institutions. These projects included "Sound characterisation of combustion noise" at the Luleå University of Technology and "The production of nitrogen oxides in diesel engines" at the Lund Institute of Technology.

VEHICLES FOR LONG-DISTANCE TRANSPORT

Most Scania vehicles are designed for long-distance transport of goods or people. About 60 percent of Scania's trucks and buses belong to this market segment.

Diesel-powered vehicles will continue to dominate long-distance traffic also in the future. From the customer's standpoint, diesel engines and diesel fuel are superior in terms of capacity and performance. Other factors are the relatively low price and the well-developed distribution infrastructure for diesel fuel.

Engine development

Late in 1997, Scania broadened its new engine platform with two 11-litre engines and an upgraded 12-litre engine. The 12-litre engine was introduced in 1995 in conjunction with the launch of Scania's new generation of trucks, the 4-series. The engine's efficient combustion, low exhaust emissions and low noise levels set a new standard for efficient, environmentally friendly engines.

The new engines have unit injectors, which means that the pump and the nozzle are combined in one assembly for each cylinder. Through individual, electronically controlled fuel injection, extremely precise combustion and a high efficiency rating can be achieved, reducing fuel consumption and exhaust emissions.

The two 11-litre engines are based on the 12-litre engine. The engine's volume has been reduced to attain optimal combustion characteristics.

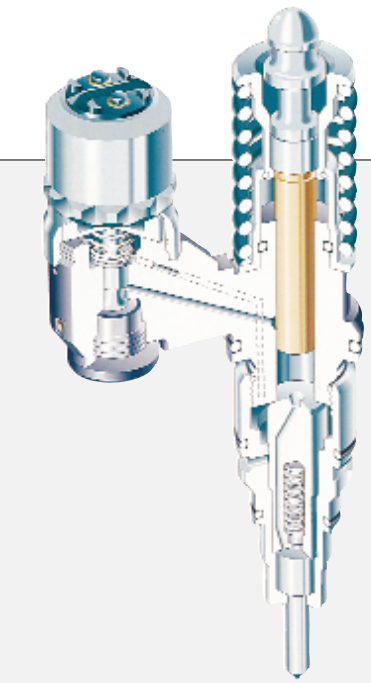
The new engines reach their lowest fuel consumption at the power output level most commonly used during long-distance driving.

Vehicle development

Due to future legal requirements concerning axle pressure and the desire of customers to increase payload – the weight of the goods that can be transported – during 1997 Scania intensified its efforts to reduce vehicle weight. Lower weight results in lower fuel consumption for a given transport task. As a result of this development work, among other things, during 1998 Scania will be able to reduce average vehicle weight by 75 kg. This weight reduction will be achieved in all areas.

Some examples:

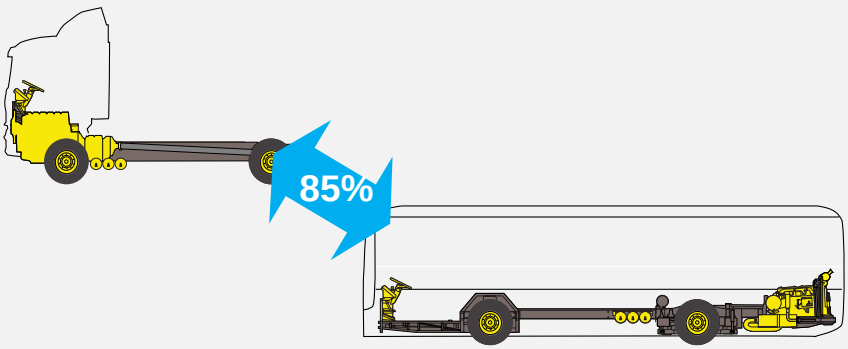
- disc brakes are replacing drum brakes.
- several engine types are being equipped with aluminium pistons.
- aluminium and plastic are gradually replacing cast iron in cylinder heads and casings.
- crankshafts are being redesigned.



Scania's unit injectors provide high pressure and high precision.

A combined injection pump and injector for each cylinder – a "unit injector" – replaces the conventional injection pump. The unit injector is located at the same place as the conventional injector. It is placed at the centre of the combustion chamber where air rotation and combustion are most favourable for clean, efficient combustion. This reduces emissions of hydrocarbons (HC), carbon dioxide (CO_2) and particulate matter (PM).

The engine's basic design, featuring four valves per cylinder, independent cylinder heads and unit injectors, makes maintenance easy. Each cylinder can be repaired and handled individually without affecting the rest of the engine.



Scania's truck and bus chassis share up to 85 percent of the same components.

During 1997, two years after the introduction of the 4-series trucks, Scania presented its new generation of bus and coach chassis. After having previously manufactured 45 different chassis models, Scania offers only seven main models in its new chassis range, yet covers a broader segment than before.

Standardisation reduces the number of components in Scania's overall product range. Standard truck components are being utilised to a greater extent. A truck chassis and a bus chassis share up to 85 percent of the same components. This allows major economies of scale during production and more efficient resource use.

Noise

Over a period of years, Scania has significantly lowered external noise levels by using new design solutions and new components and materials. Scania's vehicles meet the 80 decibel (dBA) threshold limit.

One of the major challenges facing vehicle development work is to further reduce vehicle noise levels. At low speeds, most noise comes from the engine. When speeds exceed 50 km/h, however, tyre noise dominates. This is a difficult problem because at high speeds, noise is also due to the structure of the road surface and other external factors.

The frames in the new Scania bus chassis range are 50 percent more rigid, with the same or lighter weight. This results in less noise and vibrations, which also improves comfort.

Proper maintenance reduces environmental impact

Smooth driving and good maintenance are essential in order to minimise a vehicle's environmental impact. Regular servicing ensures the continued performance of the vehicle throughout its service life.

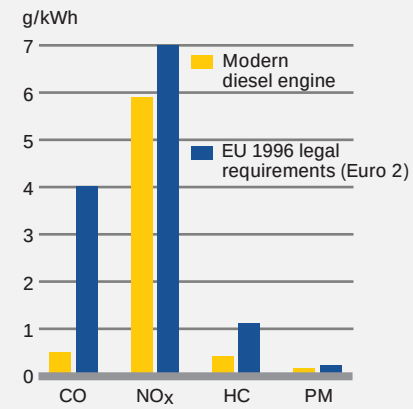
During 1997, recommended servicing and replacement intervals were extended. The type of vehicle and how it is operated determines the applicable intervals.

For Scania vehicles, the longest interval between lubrications was extended from

A growing number of customers are requesting a fixed per kilometre price for aftersales service and maintenance provided by Scania. Regular servicing at Scania workshops ensures continued performance and minimises the environmental impact of a vehicle throughout its service life.

45,000 km to 60,000 km. The automatic chassis lubrication (ACL) system has also been phased out. These measures mean that less lubricant is used, thereby reducing the environmental impact of vehicles. Intervals between oil changes were increased from a maximum of 45,000 km to a maximum of 60,000 km. This reduces both oil consumption and quantities of wastes. By using an oil filter, the interval for rear axle oil changes has been extended from 90,000 km to 180,000 km.

Emissions from Scania trucks and buses compared to current legal requirements.



CO= Carbon monoxide
NO_X= Nitrogen oxides
HC= Hydrocarbons
PM= Particulates

VEHICLES FOR URBAN OPERATION

Traffic in urban areas has the most obvious environmental impact, but shorter transport distances allow greater flexibility in the choice of fuels.

Scania vehicles for urban operation include trucks intended for goods distribution and buses intended for city traffic.

Most of these vehicles run on diesel fuel. This is the main segment in which Scania believes that customers will increasingly demand vehicles powered by alternative fuels. Scania's development work in alternative fuels takes place mainly in its bus and coach operations, where a clear demand exists today. More than 13 percent of the city buses that Scania sold in 1997 run on alternative fuels.

There is growing interest in vehicles powered by gaseous fuels. Scania built its first biogas-powered truck, which was ordered by the City of Stockholm.

Engine development

Engine development work for diesel-powered vehicles operating in urban traffic is the same as for long-distance haulage vehicles. Development work for vehicles powered by alternative fuels focuses primarily on ethanol, gaseous fuels and hybrid drive systems.

Ethanol

During 1997, Scania continued to develop and market ethanol-powered city buses.

Ethanol is a fuel with a lower energy content than diesel oil, which means about 70 percent higher fuel consumption. However, if ethanol is produced from biomass, there will be a lower net increase in atmospheric carbon dioxide. Nitrogen oxide and particulate emissions are significantly lower than emissions from diesel fuel.

Ethanol works well when used in local vehicle fleets. Its greatest advantages are in city traffic, where there is good potential for ensuring the distribution of ethanol fuel.

During 1997, Scania unveiled a new 9-litre ethanol engine that replaces the larger, heavier 11-litre engine in the new bus range. Its lower weight means lower energy consumption per passenger transported.

Gaseous fuels

Scania offers its customers buses powered by fossil natural gas, biogas or LPG (Liquefied Petroleum Gas).

Today gas-powered engines are about 25 percent less efficient than diesel engines and thus consume more fuel. 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. Biogas, however, generates a lower net increase in carbon dioxide.

Scania believes that the demand for gas-powered vehicles will grow as the gaseous fuel distribution network expands.

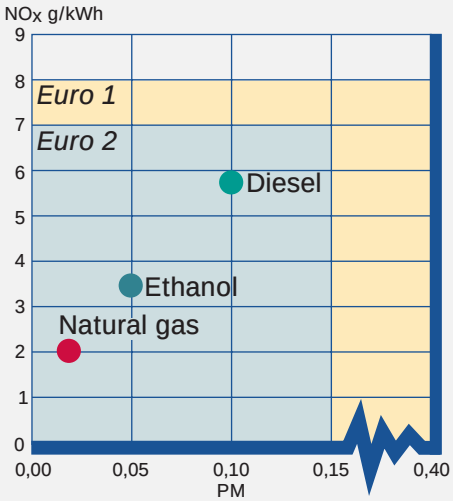
During the year, Scania delivered its first biogas-operated truck to the City of Stockholm. It is designed to deliver biogas to the filling stations where the city's 160 biogas-powered vehicles are fuelled.

Hybrid buses

Scania has been manufacturing hybrid buses in Silkeborg, Denmark for some years.

A hybrid bus has its own electrical power plant. It either operates as a purely battery-powered electrical vehicle or it can be connected to a generator powered by a car engine. The engine can run equally well on ethanol or gaseous fuel. The engine runs at a constant speed, which means that it can be optimised for low exhaust emissions. In sensitive environments, the bus can operate for short distances on a battery alone, with no exhaust emissions at all.

Nitrogen oxide (NO_X) and particulate (PM) emissions from different fuels in relation to EU legal requirements.



In its Euro 3 programme, the EU is working to further reduce emission levels.

The body of the new OmniCity city bus is built entirely of aluminium. This reduces its weight by 600 kg compared to steel, allowing lower fuel consumption.

Vehicle development

Scania's new OmniCity city bus is a good example of environmentally adapted product development. The body of the OmniCity is built entirely of aluminium. There are many advantages to this. Because aluminium can be reused several times without any appreciable loss in quality, it is attractive in the recycling market. Aluminium is also easy to work, both during production and when repairing any damage. Because the body is not welded but assembled using bolted joints, this makes surface treatment and repair work easier. The choice of material in the OmniCity bus has enabled Scania to reduce its weight by nearly 600 kilos. This means that it can carry more passengers at lower operating costs than a similar bus made of steel. A further 180 kilos can be saved if the bus is equipped with aluminium wheels.

INDUSTRIAL AND MARINE ENGINES

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

Scania's industrial and marine engines meet high standards of environmental performance. By developing a saver ring – a ring in the cylinder liner that eliminates the build-up of carbon deposits on the piston top land – it has been possible to attain higher efficiency levels. The introduction of a saver ring has extended service life, halved oil consumption and extended oil change intervals, while maintaining or reducing fuel consumption and lowering emissions of hydrocarbons and particulates. In addition, the latest generation of engines, introduced two years ago, emits 40 percent less nitrogen oxides.

In December 1997, the EU established emissions limits for machinery. Today most Scania industrial engines already meet EU standards, as well as U.S. and Japanese emissions standards. Certification of Scania engines in accordance with these standards will be completed during 1998.

There is no comprehensive international set of regulations for stationary and generator engines. However, there are a number of national regulations, including Germany's TA-Luft standard. All Scania engines with charge air-cooling designed for generator sets meet the TA-Luft limits.

For marine engines, the International Maritime Organisation (IMO) has reached agreement on a proposal for emissions limits to take effect from the year 2000. Scania's marine engines already meet these standards.

Scania's industrial engines for heavy equipment meet high standards of environmental performance. Moxy, the Norwegian-based dump truck manufacturer, was the first to install the new 12-litre engine in its equipment.

Engine development

In early 1997, Scania launched a new industrial engine based on the recently developed 12-litre engine for trucks. It comes in three industrial versions and five for power generation.

The engines were modified for their respective applications and will meet new customer and environmental standards well into the next century. One important design innovation is an electronic engine management system which allows precise engine control, including engine speed, transmission matching and emissions.

Use

Clean lubricating oil is fundamental for maintaining engine performance. By using a centrifugal oil cleaner, which comes with all Scania engines, customers avoid using an oil filter, which is difficult to recycle and is classified as hazardous waste.

RECYCLING

There is growing interest in the reuse and recycling of components and materials from vehicles at the end of their service lives.

For Scania, recycling can be evaluated in three stages:

1. Reuse, meaning that components can be used again after dismantling, with or without being renovated.
2. Material recycling, meaning that:
   a) the material can be used in components with similar quality standards.
   b) the material can be used in another product with lower quality standards.
3. Combustion or energy recycling.

   If none of the above alternatives is possible, the only option is landfill disposal of the material. In the long term, this will entail higher costs.

A vehicle's net residual value – its recycling value minus dismantling costs – will gain greater significance and become an important part of the second- and third-hand value of Scania's products. Producer liability for automobiles will take effect in Sweden in 1998. It will probably also be introduced for heavy trucks in the future.

In order to improve recycling opportunities, the "design for recycling" principle must be applied consistently. In Scania's case, this means that vehicles are designed to make it profitable to dismantle and sort materials for recycling. This in turn means that material selection will become increasingly important. Today about 90 percent of the material weight of a Scania truck can be recycled.

Scania's goal is to manufacture products that are profitable to recycle. Its service-exchange system is an example of an operation that is both economically profitable and that leads to environmental benefits. In the service-exchange system, the customer returns old, worn-out components such as engines, radiators and gearboxes, and Scania replaces them with factory reconditioned used parts. Customers' returned components will gradually be incorporated into new service-exchange units.

Residual products resulting from maintenance and repair work are another important issue. During 1998, Scania will begin the task of introducing environmental management systems at its repair and service workshops.

Scania adheres to the "design for recycling" principle. This makes it easier to dismantle vehicles at the end of their service lives and sort materials for subsequent reuse or recycling.

PRODUCTION

Two of Scania's strategic goals are to continuously lower its environmental impact and to create a good working environment.

By systematising environmental issues into an environmental management system, Scania can lower its environmental impact and achieve a good working environment. The Latin American production plants have progressed furthest in the Group.

Scania endeavours to reduce its use of raw materials, other input goods and energy as well as switch to less environmentally harmful substances.

Scania's work in systematizing environmental issues into an environmental management system has proved to be a good complement to other improvement efforts. Among other things, Scania has streamlined its production processes in terms of energy and water consumption as well as the handling of residual products. The economic advantages of recycling have become obvious and have stimulated broad involvement.

Compared to the previous 3-series, Scania's 4-series allows a larger number of possible customer specifications, while reducing the number of parts and components. The changeover to the 4-series began in 1995 and will be completed at all Scania production plants during the first half of 1998. This streamlines global manufacturing operations and reduces material and component costs. Meanwhile Scania achieves a global environmental and quality standard.

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.

In 1997, the use of processed raw materials at Scania's production plants totalled some 200,000 tonnes. Of this, steel accounted for more than 60 percent, cast iron for 35 percent and aluminium and other metals for 1 percent. In addition, finished components are purchased for installation in vehicles. At the plant in Södertälje, Sweden, large quantities of sand are also used for casting engine blocks. During the year, the use of foundry sand totalled 20,000 tonnes.

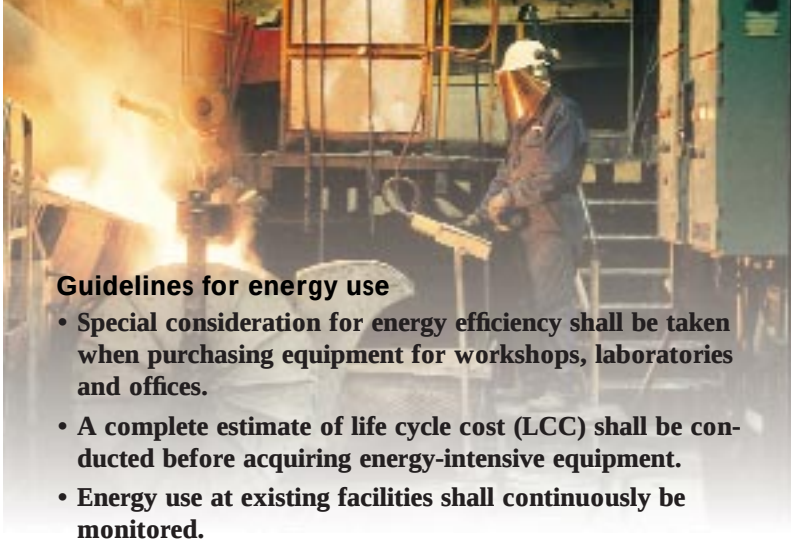
Energy use

Scania has worked for some years to reduce its total energy use. The overall objective is to reduce energy use by 10 percent by the end of 1999, using 1996 as the base year.

Today large parts of its operations use advanced systems of energy management and heat recovery. During 1997 Scania took a series of steps to further reduce energy use in its production processes. Many production plants have instituted new measuring systems for monitoring and controlling electrical energy. In Södertälje, the installation of two heat exchange units, along with other measures, has reduced Scania's district heating consumption by 25 percent.

In 1997, energy use amounted to nearly 700 GWh, or more than 14 MWh per vehicle. Despite higher production, total energy use fell by about 50 GWh compared to 1996, as a result of the steps taken.

Most energy use consists of electricity and district heating, fuel oil and natural gas. Diesel oil is used for laboratory and



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.**

acceptance testing of components, finished engines and vehicles.

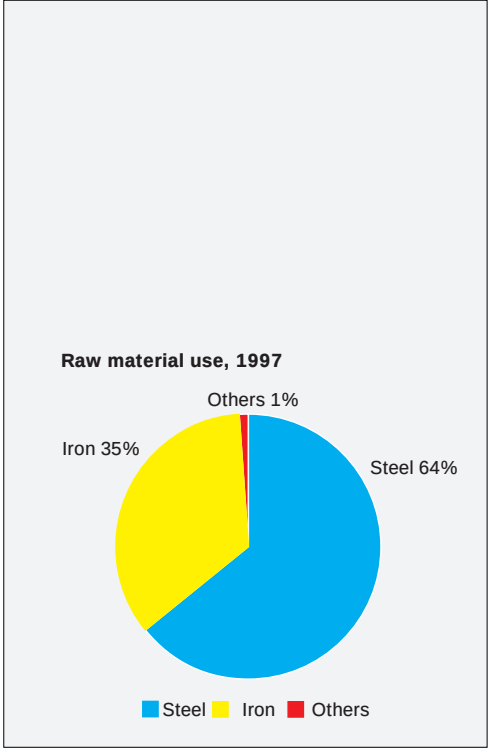
During 1995 and 1996, Scania signed agreements with the Swedish National Board for Industrial and Technical Development (NUTEK) for the EKO energy project, aimed at streamlining energy use at the company's Swedish plants. Analyses have now been conducted at six facilities, which have among other things led to a forward-looking programme of potential savings. In 1997 Scania received an EKO energy prize from NUTEK for its efforts in this field.

Water use

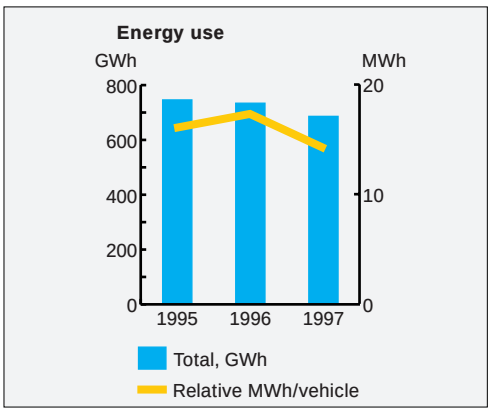
Scania is working actively to reduce its water use, the quantities of water required by its production processes and run-off into municipal wastewater systems. Water consumption in 1997 totalled some 850,000 cubic metres, or nearly 18 cubic metres per vehicle. This was 60,000 cubic metres less than in 1996, mainly due to reductions in leakage and direct water-cooling.

In general, sanitary wastewater accounts for a large proportion of water use and discharges.

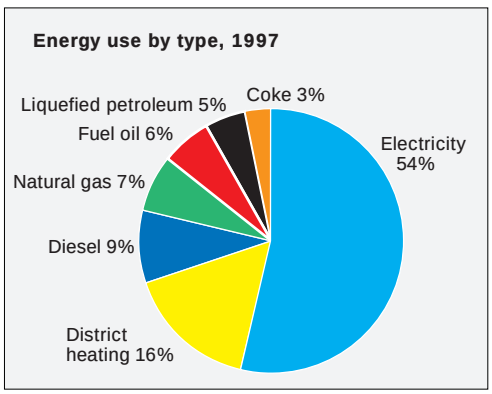
Most liquid-based production processes, including processes that use emulsions, alkaline degreasing and phosphatising, are closed circuit. However, emissions of oil, other organic substances and metals into waterways still occur. Scania is working continuously to further reduce emissions into waterways. One way is to extend the service lives of



Raw material consumption during 1997 totalled some 200,000 tonnes, excluding finished components and sand.



Energy use in 1997 totalled nearly 700 GWh, or 14 MWh per vehicle.



Most energy use consists of electricity and district heating. Diesel fuel is primarily used by laboratories and for acceptance testing of components.

process baths, thereby reducing the quantities of wastewater. Improved treatment of used process baths increases reuse and reduces liquid wastes. The long-term goal is to entirely phase out discharges into the wastewater system from production processes and other sources of liquid wastes.

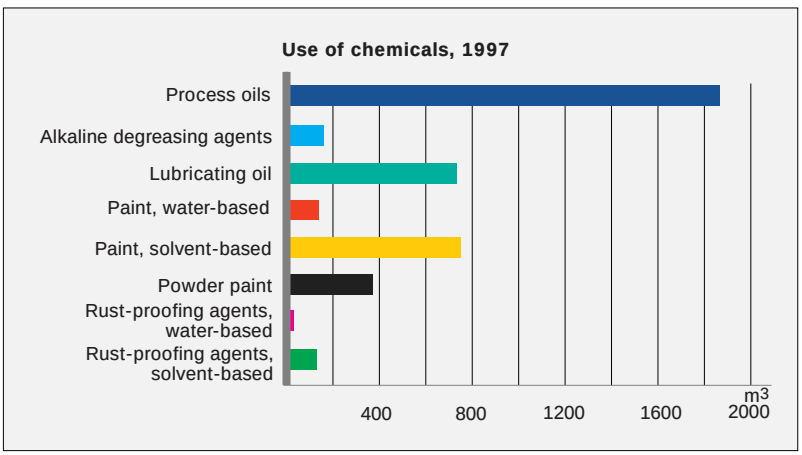
Use of chemicals

Scania applies the substitution principle as its guideline for the use of chemicals. In other words, when a less hazardous chemical with the same properties exists, it should be used instead. Thus, for example, Scania has almost completely eliminated the use of CFCs, halons and organic chlorine solvents.

In Södertälje, Scania has recently installed a large central cooling plant, which uses ammonia as its refrigerant.

Other extensively used chemicals are cutting emulsions, cutting oils, alkaline degreasing agents, hardening oil and lubricating oil. Constant improvement efforts also include reducing the use of these chemicals.

During the year, Scania began working with other Swedish vehicle manufacturers for the purpose of compiling a list of chemicals that will be prohibited from their production systems and products in the future.



Use of solvents

For years, the use and emissions of solvents have been key issues in Scania's environmental protection work. By reducing paint consumption and switching to paints that employ less solvents or none at all, Scania has reduced solvent emissions by around 75 percent during a 10-year period. Ongoing projects related to the application of primer on chassis side members and finishing coats on cabs and engine units are aimed at further reducing the use of solvent-based paints. In 1997, solvent use at Scania's European plants totalled about 430 tonnes, or 12 kg per vehicle.

Waste management

Scania's goal is to produce less waste. The quantities of wastes sent to landfills shall be reduced by 20 percent before the end of 1999 through better use of resources and better systems for at-source waste separation. Various measures taken at the plant in Luleå, Sweden, during the year resulted in a 55-tonne decline in the quantity of wastes sent to landfills. This was equivalent to SEK 125,000 in savings. By the year 2000, this waste will be reduced by a further 100 tonnes, for total annual savings of SEK 425,000. Another goal is for Scania to reduce quantities of special wastes, especially hazardous wastes, whose disposal is both costly and resource-intensive.

During 1997, quantities of wastes, excluding foundry sand, totalled some 59,000 tonnes. More than 80 percent, primarily sawdust and scrap, was recycled and around 13 percent was sent to landfills. The remainder, primarily oil waste, was disposed of as hazardous waste. Sand used in engine casting is reused both in manufacturing, where it is gradually mixed with new sand, and as covering material in landfills.

Moulds filled with firmly packed sand are used in casting engines. When the casting process is completed, the sand is tapped from the mould and reused along with new sand. Spent sand is employed as a covering material in landfills.

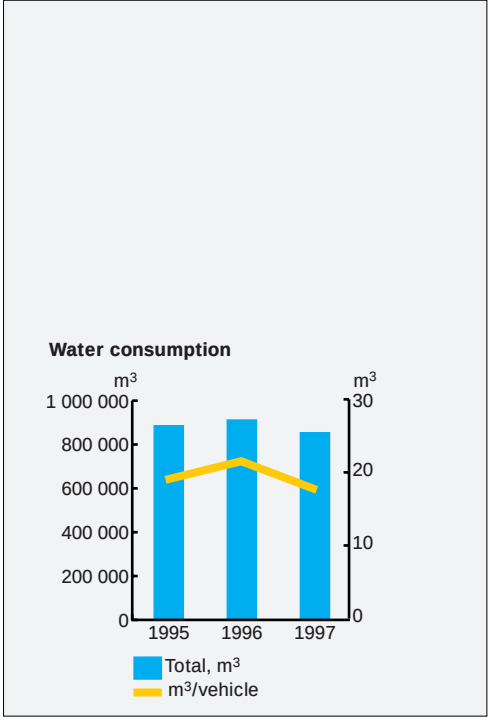
Internal haulage

For Scania, which has production and assembly plants at 14 locations in eight countries, efficient transport systems are of vital importance. 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.

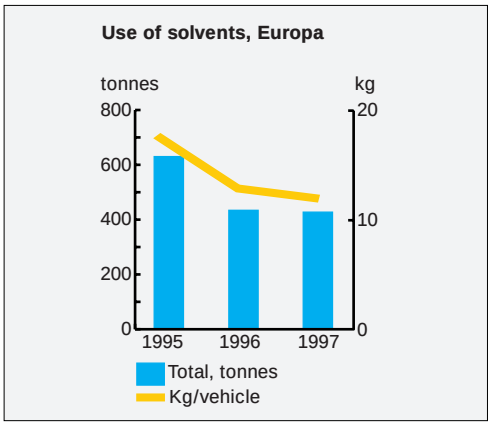
Globally, Scania buys nearly SEK 1 billion worth of transport services every year. Road haulage accounts for about 70 percent of this amount. Scania's goal is to minimise unnecessary haulage, among other things by better coordination of material flows.

During 1997, Scania introduced a new transport system for delivering parts and components from its European suppliers to its production and assembly plants in Europe. It is a so-called open transport system, which means that when Scania cannot coordinate and balance its material flows into full loads, hauliers use their empty cargo capacity for other customers. This has allowed Scania to reduce its number of hauliers in Europe from 20 to 5, resulting in significant environmental benefits.

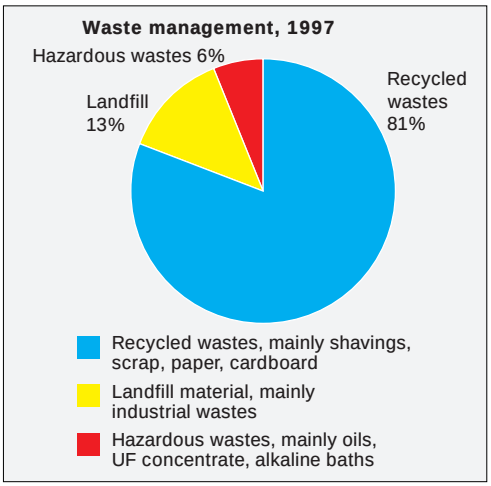
In Sweden, Scania is part of the "Transport Buyers' Environmental Handbook" project. The handbook is expected to be completed in 1998 and is intended to facili-



Water consumption in 1997 totalled some 850,000 m³, or around 18 m³ per vehicle.



In 1997, Scania's use of solvents in Europe totalled some 430 tonnes, or 12 kg per vehicle.



The quantity of wastes in 1997 totalled some 59,000 tonnes. More than 80 percent of wastes, mainly shavings and scrap, is recycled.

tate transport purchasing, taking greater account of environmental concerns and informing customers of what standards they should require of their hauliers.

Operating permits

During 1997, Scania renewed and broadened the scope of the operating permit for its production plants in Södertälje and applied for a renewed and broadened permit for its plant in Falun.

The application for Falun is aimed at increasing production by around 60 percent, enabling the plant to deliver assembled and painted axles to the entire European production system.

During the year, Scania's permit under the provisions of the Environment Protection Act was renewed for all facilities in Södertälje. Production space was expanded by around 20 percent.

Emergency planning and accident reporting

Emergency planning is important in securing the operation of Scania's production system and related departments. Each unit and subsidiary has a plan for managing sudden stoppages. Starting in 1996, all Scania employees will undergo training every five years on a rotating basis; that is, one fifth each year. The programme includes risk analysis and planning of responses to hazards, alarms and accidents. In the case of such incidents, necessary measures are taken immediately and the appropriate authorities are kept informed. No serious incidents were reported in 1997.

In conjunction with repairs and renovation work, there have nevertheless been minor leakages and spills of amines, hydraulic oil, certain metals and other substances into the air and waterways.

Cooperation with suppliers

Scania's suppliers and contractors indirectly contribute to some of the company's environmental impact. Scania will apply environmental standards to its suppliers and contractors similar to those it imposes on its own operations. Starting in 1998, Scania will require its suppliers to report how they pursue environmental work at their manufacturing facilities. It will also make environmental evaluations, using the product specifications provided by suppliers. The basis for this evaluation is the standard that Scania applies in its own operations, in other words a continual reduction in the environmental impact of its products, processes and services.

ENVIRONMENT AND ECONOMICS

Scania's on-going efforts to establish environmental management systems have led to increased resource efficiency, lower emissions and lower costs.

During the year, Scania made a number of investments in its production system, which in the long-term will result in further cost savings. Scania is continuing the task of developing an internal reporting structure that will better enable it to track and describe its environmentally-related investments, expenses and revenues. Scania's costs for the use of raw materials, energy, chemicals etc. are presented below.

Insurance

Scania emphasises preventive environmental protection work, not the transfer of known risks to an insurer. Environment-related insurance for sudden, unforeseen environmental damage falls under general liability and product liability insurance and can therefore not be reported separately.

ENVIRONMENT-RELATED COSTS, 1997

Raw material use	
Total, SEK M	1 500
Per vehicle, SEK	31 000
Energy use	
Total, SEK M	142
Per vehicle, SEK	3 000
Chemical use	
Total, SEK M	75
Per vehicle, SEK	1 558
Environment-related external insurance	
Total, SEK M	15
Miscellaneous costs	
Introduction of ISO 14001, Latin America, SEK K	800**
Environmental taxes and other environment-related fees, Södertälje, SEK K	12 227

** = Excluding training and internal implementation work

SUMMARY, SCANIA PRODUCTION SYSTEM

Year	1995	1996	**1997**
Number of vehicles manufactured	46 438	42 356	**48 147**
Raw material use			
Per vehicle, kg	–	–	**4 000**
Total, tonnes	–	–	**205 798**
Energy use			
Per vehicle, MWh	16	17	**14**
Total, GWh	746	734	**686**
Water use			
Per vehicle, m^3	19	22	**18**
Total, 1000 m^3	886	912	**854**
Solvent use			
Per vehicle, kg	18*	13*	**12***
Total, tonnes	630*	434*	**425***
Waste			
Per vehicle, kg	–	–	**1 222**
Total, tonnes	–	–	**58 817**
Recycled portion, %			**80**

*= European production plants

Overview of Scania productions plants and other facilities

Södertälje
Engine manufacture and assembly (including industrial and marine engines). Transmission component manufacture. Truck assembly. Painting of chassis side members and engine units. Technical Centre for research and development.

Luleå
Manufacture and painting of frames, frame components and rear axle housings

	Sweden 1997					
	Södertälje	**Luleå**	**Oskarshamn**	**Falun**	**Sibbhult**	**Katrineholm**
Number of employees	5 385	672	1664	657	434	769
Raw material consumption						
Iron, tonnes	20 000	1 043	–	11 650	4 460	–
Steel, tonnes	30 000	40 014	27 000	14 910	2 147	559
Other raw materials, tonnes	–	598	–	–	904	–
Energy use						
Electricity, MWh	164 580	31 500	47 000	27 200	14 600	8 420
District heating, MWh	79 225	10 700	–	–	–	15 890
Fuel oil, MWh	960	–	26 955	13 410	–	–
Natural gas, MWh	–	–	–	–	–	–
Other energy sources, MWh	87 023	150	1 290	470	7 893	1 030
Chemical use						
Process oils, m^3	345	31	–	61	74	–
Alkaline degreasing agents, m^3	57	22	3	21	6	1
Lubricating oil, m^3	186	103	15	19	9	21
Paint, water-based, m^3	–	16	–	123	–	–
Paint, solvent-based, m^3	65	41	179	6	–	33
Powder paint, m^3	48	67	137	–	–	–
Rust proofing agent, water-based, m^3	6	–	–	–	–	–
Rust proofing agent, solvent-based, m^3	4	–	66	–	–	2
Emissions into the air						
Solvent consumption, tonnes	99	76	109	17	3	27
CFC, HCFC, HFC, kg	350	7	10	39	19	6
Halons, kg	–	–	–	–	41	–
Discharges into waterways						
Water consumption, m^3	276 932	40 118	89 500 [2]	28 166	17 000	15 029
COD, tonnes	200	32	1,6	10	1,4	n.a
Oil, tonnes	5	1,2	n.a	0,01	0,12	0,08
Zinc, tonnes	0,09	0,02	0,01	0,01	0,01	n.a
Waste management						
Recycling, tonnes	13 451 [1]	7 179	8 999	5 582	1 664	481
Landfill, tonnes	3 473	391	1 063	168	86	663
Hazardous wastes, tonnes	926	368	298	487	742	29

[1] Excluding foundry sand [2] Excluding sanitary wastewater n.a: not available

Angers
Truck and bus assembly. Painting of engine units.

Zwolle/Meppel
Truck and cab assembly. Painting of engine units and chassis side members.

Silkeborg
Bus manufacture and painting.

Oskarshamn
Cab manufacture, assembly and painting.

Falun
Axle manufacture, assembly and painting.

Sibbhult
Gearbox manufacture and assembly.

Katrineholm
Bus and bus chassis development and manufacture. Painting of bus bodies.

	Europe 1997				Latin America 1997		
	Angers	**Zwolle**	**Silkeborg**	**Slupsk**	**Tucumán**	**São Paulo**	**San Luis Potosí**
	520	2 195	434	165	949	2 969	49
	–	–	–	–	4 400	30 160	–
	–	–	88	–	6 600	10 890	–
	–	–	375	–	–	–	
	5 000	17 300	2 203	660	15 151	36 300	427
	–	–	4 286	1 000	–	–	–
	–	1 050	–	–	–	–	–
	8 400	23 800	–	–	6 109	9 890	–
	450	6 527	40	1 800	2 160	4 612	224
	–	5	–	–	216	1 134	0,1
	–	1	n.a	–	2	49	–
	–	30	n.a	50	150	140	10
	–	–	–	–	2	–	–
	20	137	5	20	14	230	2
	–	28	–	–	–	94	–
	–	–	–	–	–	–	2,2
	–	10	n.a	8	–	41	–
	5	86	–	3	9	153	1
	–	–	–	–	2	250	4
	–	–	–	–	–	–	–
	13 000	58 373	10 000	6 000	79 160	212 199	8 338
	n.a	18	n.a	n.a	n.a	n.a	n.a
	n.a	n.a	n.a	n.a	n.a	n.a	n.a
	n.a	n.a	n.a	n.a	n.a	n.a	n.a
	284	1 115	–	262	1 351	7 252	44
	170	580	–	–	–	841	1
	160	315	–	1	243	146	2

Slupsk
Truck and bus assembly. Painting of engine units.

Tucumán
Gearbox and transmission component manufacture. Truck assembly. Painting of engine units and chassis.

São Paulo
Manufacture of engines (including industrial and marine engines), axles and cabs. Truck and bus assembly. Painting of engine units, chassis and cabs.

San Luis Potosí
Truck assembly.

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