

Volvo Car Corporation

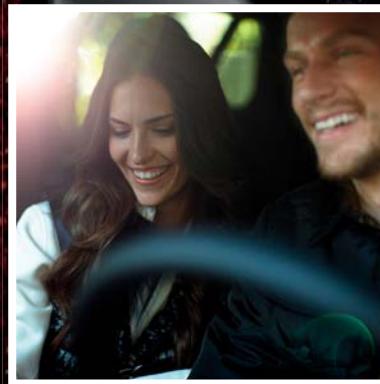
# 2010/11 CORPORATE REPORT WITH SUSTAINABILITY



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**Our view of sustainability** Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Read more about Volvo Cars' approach to sustainability.

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**Road trains** The initial test of a road train at Volvo's test track provided positive results. Volvo Cars is participating in the EU Sartre project in which seven companies in four countries are developing systems for road trains, or platooning, which may become a future complement to driving oneself.

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An increasing number of customers are looking for fuel efficiency, alternative fuels and innovative electric cars to achieve sustainable mobility. And that doesn't mean having to compromise on the pleasure of driving a luxury car.

Stefan Jacoby, CEO



**One tonne life** Can an average Swedish family meet the UN's climate goals? In January 2011, Volvo Cars and various business partners launched a six-month project to help a Swedish family lead a climate-neutral life.



**Employees** Volvo Cars' famous crash-test laboratory celebrated its tenth anniversary in 2010. It encompasses a number of professions, from crash dummy engineers to biomechanics and traffic-safety researchers. Some fifty different dummies contribute to the creation of world-class crash safety.



**Profitability** Volvo Cars will invest USD 10 M in an aggressive product plan in the next five-year period. The aim is to sell profitable cars in the luxury segment. The key to success is in designing cars based on human needs, to facilitate people's everyday lives.



**Corporate facts** In 2010, sales increased by 11.6 percent to 373,525 cars. The result was transformed into a profit of 2,340 MSEK. A large share of this upturn is attributable to increased sales of eco-sound cars, in particular. The largest market is the US, followed by Sweden and the UK.

## HIGHLIGHTS

- Volvo Cars ended 2010 with a global sales increase of 11.6 percent compared with 2009, and sales amounting to 373,525 cars. The company returned to profitability during the first quarter of 2010, and the positive trend continued throughout the remainder of the year.
- After a year of negotiations, Zhejiang Geely Holding Group acquired Volvo Cars from Ford Motor Company, as of August 2, 2010. Geely and Volvo Cars continue to operate as two separate companies under one owner, which guarantees Volvo's continued independence.
- The all-new Volvo S60 and V60 received a warm reception and favourable media reviews, combined with several international awards. The S60, with its globally unique Pedestrian Detection with Full Auto Brake was unveiled at the Geneva Motor Show.
- Volvo Cars is one of the strongest brands in environmental work and social responsibility, according to the Sustainable Brands survey, in which more than 3,000 Swedish consumers ranked the most sustainable brands in the Swedish market.

- Volvo V50 DRIVe was the year's best-selling eco-certified car model in Sweden for the third consecutive year. During 2010, environmentally certified Volvo cars were ranked first (V50 DRIVe), third (V70 Flexifuel) and fourth (V70 DRIVe) on the sales list. Eco-certified cars accounted for about 20 percent of the Company's total sales during 2010.
- Volvo XC60, equipped with City Safety, was awarded the Euro NCAP advanced safety award for new and exceptional safety technology, a certificate bestowed for the first time at the Paris Motor Show.
- An electric-powered Volvo is just as safe as every new Volvo model: at the Detroit International Auto Show in January 2011, Volvo Cars was the first car manufacturer to exhibit a crash-damaged electric car. Although the car, a C30 Electric, collided with a barrier at 64 km/h, its vital electrical components were not damaged.

2010 was a historic year for Volvo Car Corporation. After 11 years as a subsidiary of Ford Motor Company, Volvo Cars became an independent company under the ownership of Zhejiang Geely Holding. The sale was completed on August 2 and a new board was appointed.

# SUSTAINABLE MOBILITY THROUGH ELECTRIFICATION



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IRRESPECTIVE OF WHETHER THE CENTRE OF GRAVITY IS IN THE WEST OR THE EAST, CLIMATE CHANGE AND SUSTAINABLE MOBILITY ARE VITAL ISSUES FACING SOCIETY AND INDUSTRY.

As the new CEO it is encouraging to be able to show positive results and increased volumes during a year that has brought immense changes to the automobile industry in general and to Volvo Cars in particular.

March 2010 saw the launch of our new sedan model, the Volvo S60, at the Geneva motor show. Its sibling model, the Volvo V60 Sportswagon, was launched in Paris in October. Both cars have attracted significant attention for their design and world-leading safety technology; Pedestrian Detection with full auto brake.

#### **Recovery and restructure for the automobile market**

The global car industry is gradually recovering from the crisis years of 2008–2009. Volumes are increasing but weak labour and housing markets – primarily in the USA and southern Europe – continue to have a negative impact on private consumption.

The vehicle industry is undergoing a restructure, with focus increasingly shifting towards Asia. With expected annual new-car sales of 17 to 18 million units in 2011 and 2012, China will remain the most important growth market. The developing markets are also rapidly expanding their role.

#### **Sustainable mobility continues to be a key issue**

Irrespective of whether the centre of economic gravity is in the west or east, climate change and sustainable mobility are vital issues facing society and industry. The environment is in focus at Volvo Cars, along with safety and quality – values that have been the cornerstones ever since Volvo was founded back in 1927.

The developments in the field of electrification are clear for all to see, not least at the international car shows. In 2010, we launched the Volvo C30 Electric, an electric car which offers exactly the same levels of safety, comfort and interior space as the standard version. The difference is that it is powered by electricity – so it emits no exhaust emissions into the local environment.

Volvo Cars has carried out a number of tests in our advanced crash test laboratory to verify the car's safety. Our excellent results would have given five stars had this been a EuroNCAP test – and this clearly demonstrates our leadership within car safety.

In early January we shipped our crash-tested C30 Electric to the Detroit Auto Show to publicise our results after a collision at 40 miles per hour. Both the battery and the electric cables remained intact after the collision. And, what was most important, the signals from the crash dummies translated into minor injury risks.

#### **Environmental focus on a wide front**

Electric cars are one of several tracks that make up our environmental and electrification strategy. At the Geneva Motor Show in early March we revealed our next move – the Volvo V60 Plug-in Hybrid. This car packs the best features of three different car types into one – an attractive sports wagon with all the added appeal of leading-edge hybrid technologies. Through a partnership with energy company Vattenfall, we will be the first car-maker to have this new-generation hybrid on the market already next year.

In the Volvo V60 Plug-in Hybrid, the electric engine is supplemented by an economical diesel with carbon dioxide emissions averaging just 49 grams per kilometre. This corresponds to fuel consumption of 1.9 litres per 100 km.

In 2010, we launched a pioneering project in Sweden, together with partners, to find out if it is possible to reduce carbon dioxide emissions from seven tonnes to one tonne per person and year – the level considered as sustainable for our planet. Hence the project's name: "One Tonne Life". As of January 2011, a family has the opportunity to test a future climate-smart lifestyle and housing alternative just outside Stockholm. The technically advanced villa in which they live generates its own energy from the sun, and even recharges the family's car – a Volvo C30 Electric.

#### **Responsibility throughout the chain**

As a car maker our responsibility stretches throughout the value chain. From initial order at the supplier, through the production process and the car's entire lifetime, to final material recycling. We aim to run a responsible operation and the demands we impose on our own production units also apply to those of our suppliers. That is why the company's values on issues such as human rights and good working conditions are emphasised as clear-cut demands on our suppliers.

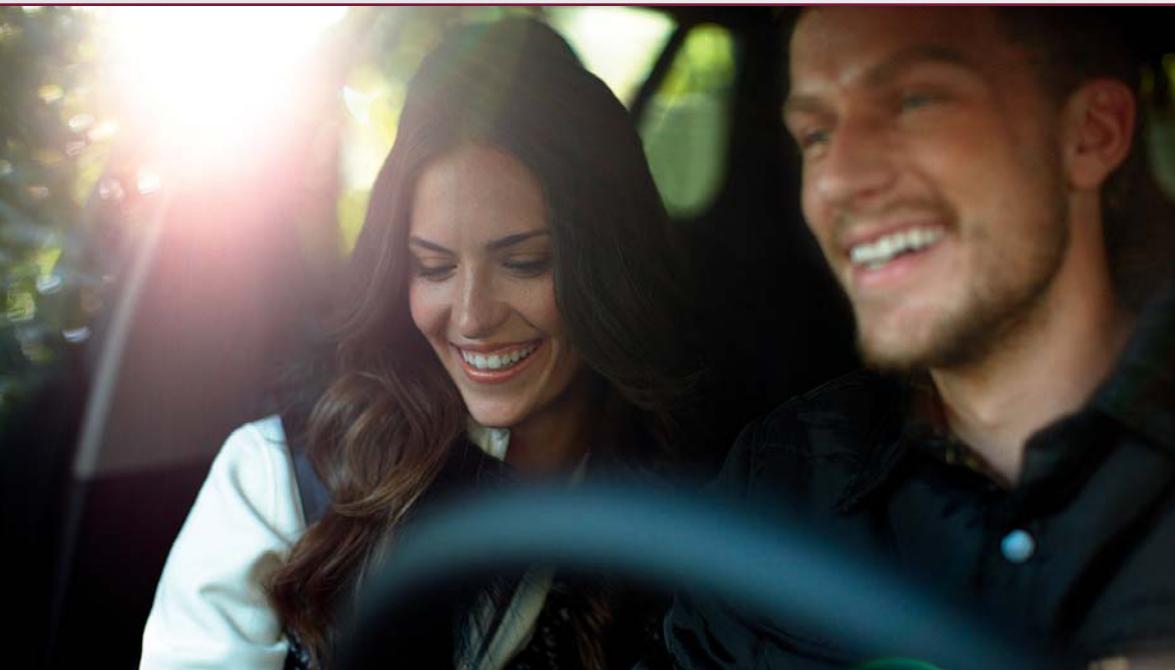
The fact that Volvo Cars is now under new ownership does not alter this basic requirement. Neither is there any compromise on the company's view of and support for the Global Compact's ten principles, which encompass human rights, working conditions, the environment and anti-corruption.

As before, this year's corporate report has been integrated with our sustainability report. We have adopted this approach in order to demonstrate that sustainability issues are part and parcel of our everyday work here at Volvo Cars. A complete GRI report can be read on our website. Do please submit any ideas you have about how we can further develop our sustainability commitment at Volvo Cars.

Stefan Jacoby  
President and CEO, Volvo Car Corporation

**Volvo Cars' view of sustainable development is based on Brundtland's definition of future generations' requirements and a financial statement comprising three elements: Economy, Environment and Social Responsibility.**

# VOLVO CARS' APPROACH TO SUSTAINABILITY



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**SUSTAINABLE DEVELOPMENT IS DEVELOPMENT THAT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS.**

**BRUNDTLAND**

## **Profitability**

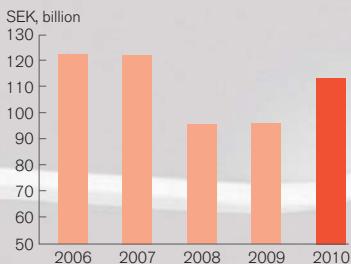
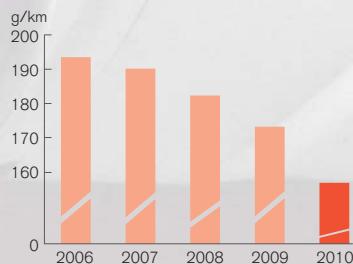
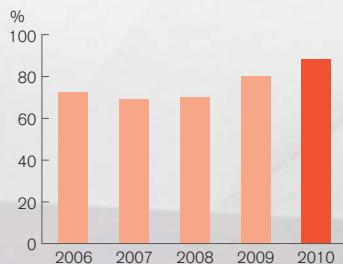
The goal of Volvo Cars is to sell cars profitably in the luxury segment. The key to success is to design cars around people – cars that match customer dreams and requirements. The luxury concept includes Scandinavian design, smart engineering art and intuitive application. An aggressive product plan, including investment in new plants and a research centre in China, offers the potential for profitable growth. Sustainable profitability will be attained by delivering attributes that customers demand and for which they are willing to pay.

## **Environmental care**

Environmental care is based on a holistic perspective, involving the environmental adaptation of a car's entire lifecycle. Volvo Cars has selected electrification as the gateway to sustainable mobility. This choice entails radical changes for the company's product strategy, as well as research and development, for which considerable expertise has been built up around electrically powered mobility. A new Volvo is now available with carbon-dioxide emissions as low as 99 grams per kilometre. The targeted objective is a future without hazardous emissions. As early as 2012, the first series-produced Plug-in-Hybrid will be available from Volvo Cars.

## **Safety**

Volvo Cars' vision is that by 2020, no serious injuries or fatalities will occur in or by a new Volvo car. That the company's safety focus applies equally to new, electric cars has been demonstrated in unique crash-safety tests in which high-voltage batteries and cables remained undamaged following collision. Safety programmes are based on research in the behavioural sciences and findings from real traffic situations, which have paved the way for successful pioneering innovations.

**+18%****REVENUE****-9%****AVERAGE CARBON DIOXIDE EMISSIONS FOR THE EU CAR FLEET****88%****NUMBER OF CARS WITH TOP MARKS IN SAFETY TESTS**

**Output rose in line with the global economic recovery. Meanwhile, the spiralling crisis in the Euro countries and rising public sector debt in the US, UK and Japan had an adverse impact on the overall economic trend.**

# GLOBAL DRIVING FORCES



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**DURING 2011, EMERGING MARKETS WORLDWIDE ARE PROJECTED TO ACCOUNT FOR 75 PERCENT OF GLOBAL ECONOMIC GROWTH.**

Following a number of years during which the climate question topped the political and media agenda, interest in the issue faded over the course of 2010. This is not to suggest that the issue has become less urgent, on the contrary. But the widespread disappointment after the Copenhagen Climate Conference, combined with the debate surrounding the UN's climate panel and the repercussions of the financial crisis, meant that the climate issue gained less media coverage than previously. However, the year ended in success at the Cancún Climate Change Conference. As a result, there is still potential to reach agreement covering the majority of global emissions at next year's summit meeting in South Africa.

#### **Recovery for the automotive industry**

The automotive industry saw an upturn after the financial crisis, with 58.7 million passenger cars registered in 2010, an increase of 6.3 percent. The market is expected to continue recovering and already during 2011 new car sales are expected to surpass the 2007 record of 62.9 million cars.

In the immediate future, 75 percent of luxury car sales are expected to derive from Europe and the US, where sales levels are forecast to rebound to the record heights of 2007.

In the years ahead, Asia and the BRICs (Brazil, Russia, India and China) are expected to represent an increasingly significant share of the global economy and a key growth market for the vehicle industry. Emerging markets are projected to account for 75 percent of global economic growth in 2011.

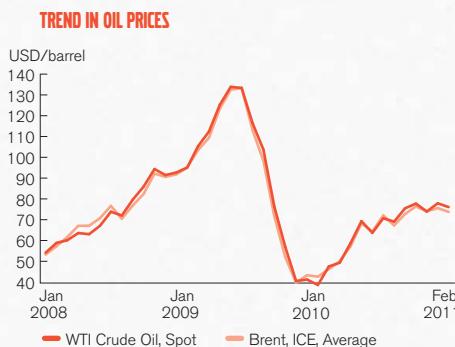
#### **Global economic factors**

Growth rates during 2010 varied from robust economic growth in developing countries to a sluggish recovery among mature economies. Also in Europe, we see a major difference between stable growth in the North – with the exception of the UK and Ireland – and feeble expansion in the South.

Commodity markets are readily factoring a rapid recovery from the financial crisis into future commodity prices, with steel manufacturers attempting to raise prices despite declining demand. This suggests a dip in steel prices during the latter half of the year.

**NEW CAR SALES**  
**58.7 million**  
 PASSENGER CARS WORLDWIDE

**PROPORTION OF ECO-SOUND CARS IN SWEDEN**  
**40%**



Oil prices remained relatively stable during the first three quarters of the year, with prices hovering around USD 77 per barrel. Prices began to advance, however, during the fourth quarter.

Interest-rate policy in various economies governs the readiness and capacity to lend funds for car purchases, for instance. The European and US central banks are expected to maintain their current – very low – interest rates far into 2011, and perhaps even into 2012, while the Swedish Riksbank has already commenced a round of interest-rate hikes.

The US dollar is expected to weaken in the long term, mostly against Asian currencies, while the Euro remains under pressure as a result of budgetary and credit problems among a number of Euro-zone countries. A contributory factor to the weakening of the dollar is that during the year, China abandoned its fixed exchange policy in relation to the dollar and permitted its currency to rise in value. The sharp upturn in the Swedish krona exchange rate during the year is a matter of concern for the Swedish export industry, which is again looking at narrower margins.

Regulations and legislation relating to environmental issues continue to be marked by a major lack of international coherence and political consensus.

#### Swedish transport sector

A buoyant Swedish economy and pent-up demand following the financial crisis led to a 35.6-percent surge in new car registrations in 2010. The proportion of eco-sound cars reached a record 40.1 percent, with the Volvo V50 DRIVe topping the sales list.

Despite the rising number of eco-sound cars in Sweden, the trend over the past two years of declining emissions from transport has now been broken. The reason is the ever-increasing number of cars and their longer use. The rising proportion of more fuel-efficient new cars and renewable energy consumption does not suffice to offset the increase in traffic.

In terms of traffic safety, Sweden tops the global league – according to data from the Swedish Transport Administration (Trafikverket). During 2010, Sweden noted 270 fatalities, the lowest figure for the past 100 years. It is also the lowest number of traffic fatalities worldwide in relation to population size.

**What can the average Swedish family do to meet the UN's climate goals? Can a family's emissions of greenhouse gases be reduced from the Swedish average of 7–8 tonnes per person annually to a more sustainable level of about one tonne? In January 2011, Volvo Cars and several business partners launched a six-month project to help a Swedish family try to lead a climate-neutral life.**

# PAVING THE WAY WITH GREEN COOPERATION

"We believe a great deal can be achieved without any major restrictions on personal freedom. Volvo's target group consists of active people with leisure interests. This is an ordinary family willing to move in the right environmental direction," says Malin Persson, Manager Safety & Environment Communication at Volvo Cars.

## **Volvo C30 powered by renewable energy**

Volvo Cars, Vattenfall, a major Swedish power company, and A-hus, a home builder, have signed a cooperation agreement, according to which the test family will be provided with the necessary products, advice and services. The home is a climate-smart house that generates more electricity than it uses. Volvo Cars has contributed a Volvo C30 Electric – an all-battery-powered car – that is included in the research project with a view to evaluating the feasibility of a broad-based launch of the model.

"A highly energy-efficient car is definitely a product of focal interest in a climate-smart future. We want to show how our electric car can help a perfectly ordinary family adopt an environmentally sustainable lifestyle," says Malin Persson.

## **Planning is the key**

Living green is a matter of planning – as well as bargaining and compromising in terms of what is important. If the family decides to travel north to the mountains on their Easter vacation, their plans for a more distant summer vacation destination may have to take a lower priority. Organic products and weekly purchases of locally produced seasonal food become a natural part of everyday life.

The project was launched in early 2009 when A-hus contacted Volvo Cars. It was soon widened, when it was linked to the UN climate challenge, and Vattenfall was asked to join and provide an electric power solution based on environmentally certified electricity from hydroelectric or wind power plants.

Vattenfall has also provided a climate coach, helping the family consume energy as efficiently as possible and measuring all energy consumption in the house. Chalmers Institute of Technology in Gothenburg calculates the family's CO<sub>2</sub> emissions. As part of efforts to include all requirements, industrial partners such as Siemens and ICA are responsible for providing household appliances and food products, respectively.

"All the project partners are striving to test cutting-edge products that reduce climate impact. At the same time, we want to provide counterproof to debunk widespread myths that electric cars are not as safe as conventional passenger cars, or do not have enough luggage space for family requirements, or that they are generally difficult to live with," Malin adds.

## **A project that changes the perspective**

The world can monitor the family's energy consumption on the Internet\*, where the family blogs about their challenges – and accepts helpful hints from readers. Supported by careful planning in the form of a CO<sub>2</sub> budget, the challenges

become reasonable and amusing. And the project makes a tangible contribution to spreading knowledge about how people can lead sustainable lifestyles with a reasonable effort.

All interested parties can monitor the family's learning process; from their everyday life in Stockholm to details about how the family members meet the challenge of making green choices and, in the final analysis, hopefully transform them into everyday routines.

"We haven't lived on one tonne of CO<sub>2</sub> in Sweden since 1948. Today, we've made vast improvements with respect to energy efficiency, but our consumption has skyrocketed. The general perception is that we could meet the one-tonne challenge in about 100 years from now. Our project, however, is changing that perspective and we are taking a giant step into the future," notes Malin.

## **A wish to be independent**

Designed by Swedish architect Gert Wingårdh, the house is situated in Hässelby Villastad, outside Stockholm. A model house has also been built opposite Liseberg, an amusement park in central Gothenburg.

Through solar panels on the roof and walls, the family generates its own energy both for the house and their car. This small-scale approach, with a total lack of dependence on outside energy sources, is expected to attract widespread interest. At certain times of the year, for example during winter cold snaps, the in-house electricity generation has to be combined with electric power produced on a larger scale, which is when Vattenfall comes into the picture with supplies of sustainable energy.

A fully charged car has a range of 150 km, which covers the family's transport requirements on the home front. The car is charged from an ordinary wall socket in the garage, or at charging stations throughout the city. Volvo Cars is Sweden's largest player in car pools and, for longer distances, the family can borrow other eco-sound cars from one of Volvo's conveniently situated car pools.

## **Smart solutions available today**

The commercial aspect of the project is to show what can be achieved with the help of leading-edge technology and informed choices. The house and the car are modern, but by no means futuristic. Series production of Volvo's Plug-in hybrid will commence in 2012, and A-hus already displays the home in its product catalogue.

"There has never been a problem with the drive and creativity of the project, which focuses equally on learning and achieving its goals," explains Malin.

"We want to make a difference on the day-to-day level with the help of commitment combined with technology that is already available for mass production. Technology that is accessible – also in terms of costs – for the average family."

**\*) Read more and follow the family at [www.onetonnelife.com](http://www.onetonnelife.com)**



## One Tonne Life



### Key data on the Volvo C30

**Electric engine**

111 bhp (82 kW)

**Torque**

220 Nm

**Maximum speed**

130 km/h

**Acceleration**

0–70 km/h in 6.5 seconds

**Batteries**

Lithium-ion 24 kWh

**Charging**

230 V, 16/10/6 ampere

**Charging time**

16 ampere  $\leq$  7 hours

**Range**

Up to 150 km

**Battery weight**

2 x 140 kg

**Weight increase compared with standard car**

+ 300 kg

**Over the next five years, Volvo Cars plans to invest USD 10 billion in an aggressive product plan globally. The volume target is to achieve sales of 800,000 cars by 2020.**

# PROFITABILITY CENTRED AROUND PEOPLE

The core strategy is to continue to strengthen the presence in mature markets, while also fully capitalising on the potential offered by emerging growth markets.

Volvo Cars' goal is to sell profitable cars in the luxury segment. The key to success is to design cars around people – cars that fulfil customers' dreams and requirements.

As an independent company, Volvo Cars is now going its own way in meeting and surpassing customer expectations. Facilitating people in their everyday lives is a natural feature of the Scandinavian luxury concept. Volvo Cars puts people in the centre – and offers Scandinavian design, advanced engineering and intuitive cars.

#### **Positive sales figures**

Following two challenging years, Volvo Cars reported a profit for the first quarter of 2010 and the positive trend continued for the remainder of the year. Earnings for the entire year point to a profit in all quarters – a sharp recovery compared with 2009, for which the company recorded a loss of USD 653 million. Eco-sound cars were a major factor underlying the upturn during the year.

During 2010, global sales rose 11.6 percent (373,525 cars) compared with the preceding year. The most successful markets included Russia, with a sales surge of 54.5 percent compared with 2009, Belgium (up 35.9 percent) and Norway (up 38.9 percent). Demand for the fuel-efficient DRIVe models remains buoyant, with XC60 sales outperforming all other models in the Volvo range.

The Swedish market recovered surprisingly fast following the recession, as reflected in the sharp increase to more than 55,000 new vehicle sales. The Volvo V50 DRIVe was Sweden's best selling eco-certified car for the third

consecutive year. Eco-certified cars accounted for 20 percent of Volvo's total sales in the domestic market in 2010. The past year commenced with robust sales in the European and US markets. The electrification of Volvo Cars' models moved into the commercial phase. In addition to the commencement of sales, the company also initiated extensive programmes aimed at training engineers and personnel at the dealer level.

#### **People at the centre**

Volvo is a small player in the global car industry, a position that offers advantages and disadvantages. On the positive side, there is the potential for greater flexibility. A small company is more nimble and can be redirected fairly promptly. Meanwhile, however, a small company has fewer resources. It is imperative to make definite choices in research and development programmes. To date, the focus has been on efficiency, alternative fuels and electrification. To these technical solutions, Volvo Cars is now adding "soft" values such as design and experience.

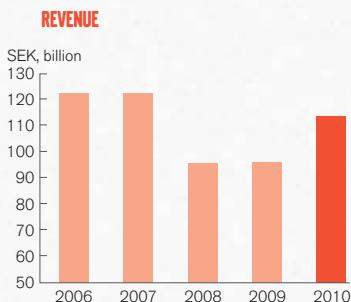
Attracting the right customers entails daring to adopt a specific profile. Current efforts in analysing and developing the brand are clearly linked to profitability: moving potential customers from brand awareness to making an active decision to purchase. In the luxury segment, such decisions are frequently based on emotions.

Volvo Cars' historic and sensible core values – Environment and Safety – are well anchored globally and continue to be core brand features. In these areas, the company is consistently at the leading edge with a series of unique solutions – ranging from innovative electrification technology to vehicle road-train systems and collision-avoidance solutions.

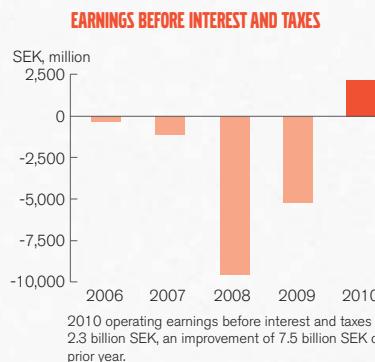
#### **VOLVO CARS' NEW VISION**

# TO BE THE WORLD'S MOST PROGRESSIVE AND DESIRED LUXURY CAR BRAND.

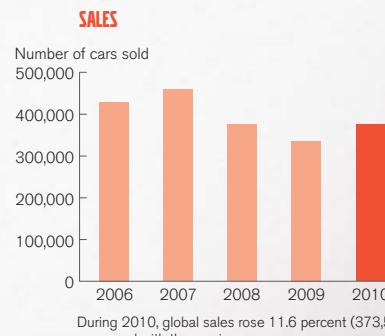
# +18%



**IMPROVEMENT OF  
7.5  
BILLION SEK**



# +12%



## Luxury to meet human needs

The new brand strategy, which will be implemented throughout the organisation in 2011, adds new values in the form of a re-interpretation of the concept of "Scandinavian Luxury" – values that awaken feelings and attract the targeted customer group. Scandinavian Luxury involves understanding people and offering products that centre on their requirements. Brand, products and services jointly signal Volvo Cars' new cornerstones: Designed around people, Contemporary Luxury Experience, Strength in every sense.

Volvo Cars has always been an innovator in terms of technical solutions. We must now perform to an even greater degree in terms of offering customers added value. In a sense, one could say that technology must primarily assist the car owner to live an uncomplicated life. Volvo Cars' CEO, Stefan Jacoby, refers to the concept of the car industry's "Apple", meaning cars that are intuitive, simple to use, beautifully designed and always at the leading edge in terms of innovative solutions.

## Key second domestic market

The growth strategy in China means that Volvo Cars plans to build new plants and make major investments that will contribute to the development of new global car models. In addition, the number of dealers will double and an entirely new car model will be manufactured. The goal is to sell 200,000 vehicles in China by 2015 by capitalising on sharp growth in luxury car sales in the Chinese market and by expanding market share.

The initial plant will be built in Chengdu. Manufacturing will get underway in 2013, with an annual production capacity of more than 100,000 cars. The next step to be studied is the construction of a second plant in the Northern Chinese city of Daqing, which is planned to produce an additional 200,000 cars annually.

The supplier base in China will be optimised for the global market. Wherever the cars are developed and built, the focus will always be on quality and safety. Volvo Cars' global manufacturing and quality systems apply irrespective of where the cars are produced.

**Volvo Cars has opted for electrification as its gateway into the future. This choice has entailed radical changes for the company's production strategy and the direction of its research and development programmes.**

# ELECTRIFICATION – TOWARD ZERO EMISSIONS

Just a few years ago, Volvo Cars' expertise in the area of electric cars was limited to a department in Product Development. Today, electrification permeates just about every aspect of the company. In a very short time, considerable expertise has been built up around the electric powering of cars in all areas – from battery safety to fuel cells.

Volvo Cars is convinced that electricity is the future power source for the transport sector. Electric powering offers many benefits.

An electric motor is four times more efficient than a combustion engine. This means that electric cars and cars based on hybrid fuel sources consume less energy and thus emit fewer emissions than cars using only a combustion engine. Electric powering also means substantially less fuel cost, no local carbon-dioxide emissions and quieter performance. The power consumption of electric cars imposes a relatively low load on the power grid. In Europe, the rising power requirement is amply covered by ambitious plans for renewable energy. An average wind power turbine produces sufficient energy to run 3,000 electric cars.

#### **Volvo's initial electric car series is on the way**

The first all-electric cars will be delivered to customers already during 2011. The Volvo C30 Electric features an electric motor driven solely by batteries and thus offers zero emissions.

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**AN ELECTRIC CAR FROM VOLVO CARS IS NO COMPROMISE. IN MOST CASES, THE RANGE IS AMPLE FOR EVERYDAY DRIVING.**

**LENNART STEGLAND, PRESIDENT OF SPECIAL VEHICLES SUBSIDIARY**

VOLVO C30 ELECTRIC

**0 g/km**

CARBON DIOXIDE



The Volvo C30 Electric has an electric engine that is driven exclusively on batteries, thereby generating zero emissions.



## Volvo Cars' electrification strategy – three elements

Launching electric cars on a large scale represents a pioneering move in the automotive industry, and one that Volvo Cars has accepted with considerable effort and energy. Fifty of the first 250 vehicles are part of a research programme for preparations for a large-scale launch of electric cars.

Volvo Cars and the Swedish Energy Agency initiated the research programme. This is aimed at raising insight into how customers use electric cars and identifying the factors that determine battery service life. The 50 cars have been deployed in four locations in Sweden: Umeå (northern Sweden), Gothenburg (western Sweden), Stockholm (central Sweden) and Malmö (southern Sweden).

### **How is service life affected?**

The research vehicles gauge a wide range of variables so that Volvo Cars can diagnose and log how the customer handles the battery pack.

An electric car is a commuter vehicle for everyday use. According to the New European Driving Cycle (NEDC), the C30 Electric can be driven over a range of 163 kilometres, although Volvo Cars currently rates the distance at 120 kilometres. Many functions in the car require energy. Few drivers have even noticed that a conventional car uses more fuel when such functions as heating, air conditioning, radio or headlights are activated. In the case of an electric car, energy consumption affects the range.

### **No compromise**

"An electric car from Volvo Cars is no compromise," notes Lennart Stegland, President of the Special Vehicles subsidiary. "In most cases, the range is ample for everyday driving."

90 percent of commuters worldwide drive less than 100 kilometres daily, and in practice eight out of ten journeys are to or from work.

The Volvo C30 Electric vehicles scheduled for production during the period 2011–2012 that are not included in the Swedish Energy Agency's research project will be leased out to companies in Sweden, Belgium, Germany, Norway, China and the US, where considerable interest has been noted. So far, no cars have been sold but have instead been leased out on contract.

"Discussions are in progress concerning who should pay extra for cars with zero emissions – the customer, the car maker or the State. We imagine that it will be a combination of all these," says Lennart.

### **The next step – a knowledge boost**

As yet, electric cars are only at the inception of their development and, thus, widespread information programmes are now in progress. Volvo Cars assumes responsibility beyond that for the actual car and informs customers and dealers alike of the special requirements that an electric car imposes in terms of daily use and workshop service.

**Electric cars:** Cars powered solely by electricity are a key component of Volvo Cars' electrification strategy. Already during 2011, the initial customers will receive delivery of the Volvo C30 Electric, an all-electric car with a range of up to 150 km. Various research programmes are in progress to extend the range, such as the use of fuel cells.

**Plug-in hybrids:** A plug-in hybrid features both an electric motor and a conventional combustion engine. This is charged using a cable connected to the public power grid. The Volvo V60 Plug-in Hybrid, which was exhibited at the Geneva Motor Show in 2011, has a range of up to 1,200 kilometres.

**Full hybrids:** A full hybrid is a car fitted with both an electric motor and a combustion engine and is self-charging. For example, energy from braking is deployed to charge the batteries. Volvo Cars aims to combine its new, fuel-efficient combustion engines with electric cars to gain very low fuel consumption.

**At the Geneva Motor Show in March 2011, Volvo Cars presented the world's first diesel plug-in hybrid. This type of car permits the driver to personally select the combination of driving performance and environmental impact. The plug-in hybrid will be available from dealers in 2012.**

# VOLVO V60 PLUG-IN HYBRID – A WORLD INNOVATION

The car has three temperaments, all with different features:

**Pure:** the car makes maximum use of the electric motor. The range extends to 50 kilometres with zero carbon-dioxide emissions when the battery is charged using renewable energy. Whatever the electricity source, the tailpipe discharges no emissions.

**Hybrid:** in this case, the electric motor and diesel engine interact to provide a combination of driving pleasure and low environmental impact. The car emits 49 grams of carbon dioxide per kilometre and has a fuel consumption of 1.9 litres /100 kilometres. The range in the hybrid mode is 1,200 kilometres.

**Power:** the car adjusts to provide optimal performance. Combined, the diesel engine and electric motor have 215 + 70 hp and a torque of 440 + 200 Newton metres. The electric motor's instantaneous torque helps to accelerate the car from zero to 100 km/h in just 6.9 seconds.

With the simple push of a button, drivers personally select which car they wish to drive – Pure, Hybrid or Power.

The front wheels on the Volvo V60 Plug-in Hybrid are powered by a five-cylinder diesel-electric engine that delivers 215 hp and a maximum torque of 440 Newton metres, just as in a conventional Volvo V60.

The rear wheels, however, are powered by an electric motor that provides 70 hp. It gets its energy from a 12-kWh lithium-ion battery. The system is called ERAD (electric rear axle drive). A control system manages the interaction between the two systems, totally unnoticed by the driver.

#### Additional choices

The Plug-in Hybrid also offers a number of other possibilities: the driver can select between diesel and electric power and thus save battery capacity during in-town driving, for instance.

A button on the instrumental panel activates electric-powered, four-wheel drive with the torque distributed both to the diesel-powered front wheels and the electric power rear axle. The driver can set the driving distance, permitting the car's control system to optimise the balance between diesel and electric power to attain minimum carbon-dioxide emissions for the particular stretch. A Plug-in-Hybrid is charged using a conventional cable from a regular 230-volt wall socket. The charging time depends on the strength of the fuse. Using a

6 amp fuse requires 7.5 hours to charge, while a 10-amp fuse reduces the period to 4.5 hours, and a 16-amp fuse will provide a fully charged car in just three hours.

#### A climate smart interior, too

In addition, the car offers a pleasant interior climate right from the start thanks to the potential to heat or cool the car during charging. This also means that battery capacity does not need to be used to heat or cool, instead all power is focused on driving the car.

Vattenfall, a major Swedish power producer, has been a partner in the development of the electric car and contributed its solid electrical expertise. The Plug-in Hybrid is partly the result of the V2Plug-in-Hybrid Vehicle Partnership, in which Volvo Cars and Vattenfall have cooperated since 2009 in testing and developing plug-in technology.

"We're taking a major step toward our vision of zero emissions 'DRIVE towards zero'," says Stefan Jacoby, Volvo Cars' CEO. "When the Volvo V60 Plug-in Hybrid is driven only on electricity and charged with renewable energy, then we're already there."

#### Fuel cells extend the electric car's range

Volvo Cars is researching vehicles that run on fuel cells as part of efforts to extend the electric car's range to 250 kilometres without carbon-dioxide emissions.

The first step of the project involves a feasibility study of the effects of a fuel cell with a reformer. The task of the reformer is to break down a liquid fuel and form hydrogen. In the fuel cell, the hydrogen is transformed into electric energy to drive the car's electric motor. Petrol is used in the feasibility study, but the technology works for all liquid fuels and can also be modified to handle renewable fuels.

The process takes place without any emissions of carbon dioxide, nitrogen oxides, sulphuric oxides and particles. Thanks to the high efficiency rate, carbon-dioxide emissions are sharply reduced compared with a conventional vehicle. The final products from a fuel cell coupled with a reformer are electricity, water and a minor amount of carbon dioxide.

VOLVO V60 PLUG-IN HYBRID EMITS

**49 g/km**  
CARBON DIOXIDE



**Volvo Cars' production of electric cars does not compromise on safety. The company should always be a world leader. In the event of an accident, both the passengers and batteries are effectively protected.**

# LEADING IN BATTERY SAFETY

Electrification entails the greatest change for the car since its invention – and in essentially all areas. From a safety perspective, the car's 400-volt battery pack raises a number of issues that must be systematically considered.

One basic demand that Volvo Cars must meet is that safety functions as well in practice as it does in the laboratory. One of the company's strengths is its solid expertise in how cars perform in real accidents. Accordingly, the company imposes strict requirements on its electric cars, which extend far beyond legislated stipulations.

#### Copes with rigid poles

"For us, electrification technology is an additional exciting challenge in our quest to build the safest cars on the market," notes Thomas Broberg, Volvo Cars' safety expert.

One Volvo requirement is that an electric car must even cope in collisions with rigid poles, which present the most difficult situation. With the Volvo C30 Electric, the body is modified to deal with this difficult situation, too.

Volvo's safety approach to electric cars focuses on battery safety in the event of a collision. In everyday use, an extensive and advanced monitoring system checks that each cell has the right voltage and ensures, by means of cooling, that the cell's working temperature is optimal, an important feature for safety and working capacity. In the event of any deviation, the battery is automatically shut off for preventive reasons.

#### Robust encapsulation

In the Volvo C30 Electric, the batteries are fitted in the traditional fuel tank position and in the tunnel area. The batteries are robustly encapsulated. Beams and other parts of the car's structure around the battery pack are reinforced. All the cables are shielded for maximum protection.



**FOR US, ELECTRIFICATION TECHNOLOGY IS AN ADDITIONAL EXCITING CHALLENGE IN OUR QUEST TO BUILD THE SAFEST CARS ON THE MARKET.**

**THOMAS BROBERG,  
VOLVO CARS' SAFETY EXPERT.**



At the Detroit International Auto Show in 2011, Volvo Cars proudly displayed a crashed Volvo C30 Electric. The vehicle had undergone a frontal collision test at 64 km/h. The batteries and crash dummies remained undamaged.

"The primary aim is to protect people. So, we have redesigned the car and created structures around the safety cage and reinforced the beams in certain points," explains Jan Ivarsson, Senior Manager, Safety Strategy & Requirements at Volvo Cars.

In the event of a collision, the collision sensors ensure that power is cut in 50 milliseconds.

The system has several fuses that cut directly if an earth fault is detected. The function shuts off the battery if the voltage flows in the wrong direction, such as when a cable comes into contact with the body frame.

#### Reinforcements under the bonnet

In a conventional car, the engine is the heaviest component. An electric car is considerably lighter and this gives rise to issues involving energy distribution. When a conventional car crashes, the engine distributes the impact force between the front beams. In an electric car, the engine compartment is reinforced using a lattice beam structure that absorbs these forces and also helps to absorb the higher collision energy created by the car's higher overall weight.

Volvo Cars' safety approach also encompasses events after a collision. A heavier collision triggers the crash sensor in the airbag to automatically cut the power so that the car is safe for rescue personnel and passengers. Volvo has close cooperation with the rescue services, which have detailed instructions as to how they can most safely handle various Volvo cars in the event of an accident.

**Today's combustion engines are more efficient than ever. In 2010, Volvo's cars reduced carbon-dioxide emissions from the EU car fleet by 9 percent.**

# CONVENTIONAL ENGINES INCREASINGLY EFFICIENT

While electrification represents a key gateway to the future, carbon-dioxide emissions and fuel consumption must continue to be reduced in current car models. Volvo Cars is fully committed to this task.

In the domestic market, Sweden, Volvo Cars notes an extreme trend reversal in terms of fuel. The proportion of petrol-powered Volvo cars in Sweden has gone from more than 95 percent in 2002 to less than 4 percent in 2010. The fuels that have taken over are primarily diesel and Ethanol E85 (FlexFuel). The major high-sales vehicles in the past year were the fuel-efficient DRIVe vehicles, while a distinct decline has been noted for fuels such as ethanol and gas.

Fuel preferences differ among markets. In Europe, diesel has long been the most popular fuel. In North America and other parts of the world, the overwhelmingly popular choice is petrol. Accordingly, Volvo Cars seeks to offer energy-efficient engines to match a variety of fuels.

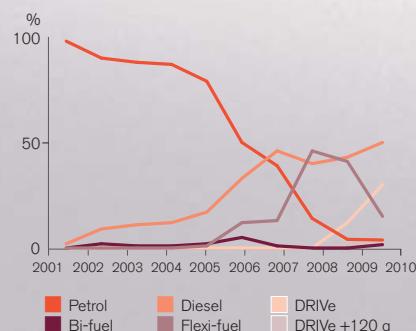
Each new engine generation from Volvo is considerably more energy efficient than its predecessor. 2010 saw the launch of the D3 – a five cylinder two-litre engine rated at 163 hp. With manual transmission, fuel consumption is as low as 5.5 litres per 100 kilometres.

2010 marked the launch of a number of diesel engines, including the four-cylinder GTDi engine with a stroke volume of two litres and 203 hp, and a rated fuel consumption of 8.1 litres per 100 kilometres. Another innovation was a dual version of the 1.6 litre GTDi engine: the T4 with 180 hp, and the T3 with 150 hp. Torque for both engines is 240 Nm.

The new T6 inline six-cylinder petrol engine proved a major success in the US where it secured a ranking on Ward's 10 Best Engines list, beating off competition from 38 rivals. "Incredibly smooth" was the consensus of the jury. By reducing internal friction, the engine is 10 percent more energy efficient than its predecessor and now delivers 304 hp and fuel consumption of 10.2 litres per 100 kilometres.



FUEL MIX VOLVO IN SWEDEN



VOLVO'S MARKET SHARE, ECO-SOUND CARS IN SWEDEN

**20%**  
**-16 g/km**  
TO 157 G/kM IN THE EU

**For more than four decades, Volvo Cars has actively pursued environmental programmes that have enabled the company to make substantial progress in terms of environmental considerations in production – notably in decreasing emissions to air, an area in which the company is world leading.**

# FOCUS ON WATER AND ENERGY

Viewed from a life-cycle perspective, vehicle utilisation is the primary factor that impacts the environment. But in line with the improved environmental performance of cars, a keener focus is turning towards reducing environmental impact in respect of materials selection, production and the final vehicle scrapping.

## New environmental strategy

Since summer 2010, the company's environmental planning has been shaped to form an overarching environmental strategy that covers operations and product alike. Environmental strategy, which is monitored and updated annually, is coordinated with Volvo Cars' business strategy. The objective is that environmental issues should be every bit a natural component of business strategy as financial issues. Experience shows that a sharper focus on reducing environmental impact of products and production is good for business.

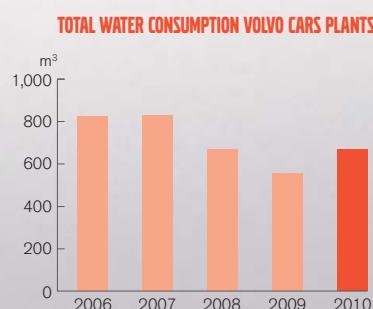
For each strategy area, the company has conducted a SWOT-analysis of the current status and the desired position in the short, medium and long terms. The strategy areas are: Zero environmental accidents, Water footprint, Energy efficiency and climate neutral operations, Waste management, Sustainable transport and Emissions to air.

## Reduced energy consumption

One overall objective is to continuously reduce Volvo Cars' total energy consumption, which represents a large share of the company's overall environmental impact. A core component of the environmental strategy is, for example, to recycle spill heat from our operations and those of other industries and to replace fossil fuel with renewable fuel.

Since January 2008, the European plants have used climate-neutral electric power, primarily from hydropower. At the Ghent plant, 15 percent of energy consumption derives from three wind power turbines on the company's site. During the past five years, the company's carbon-dioxide emissions have been reduced from 150,200 tonnes to the current 64,700 tonnes.

Each production location has a local energy manager to coordinate all energy-related activities. Energy mapping is undertaken continuously in the company's buildings and processes.



## Focus on water

Volvo Cars has long worked in a targeted manner to reduce the company's emissions to water and is endeavouring to be the leader in the automotive industry. During the year, the environmental protection department worked with adapting the Global Water Footprint method for the automotive industry to thereby gain a comprehensive picture of Volvo Cars' impact on water.

The Global Water Footprint is used to calculate Volvo Cars' water footprint. Water management is divided into two areas: the grey water footprint, meaning the quality of the water released from plants; and the blue water footprint, meaning the quantity of water used in production.

## Project to upgrade waste management

During 2010, the company reviewed its overall waste management system in an effort to identify a joint working approach for the entire company. The project provided environmental and financial benefits, and resulted in a new joint waste management process that will be used globally as of spring 2011.

One example of the new measures is a company-wide sorting-at-source book, which notes the synergy and good examples in the organisation. There are several concrete examples in which waste in various ways can be recovered or recycled in other processes, such as for filler in road construction.

## Extremely low emissions to air

The paint shops in Gothenburg and Ghent are among the best worldwide in terms of minimising solvent emissions to the air. When the new Gothenburg paint shop was constructed in 1991, the most advanced technology at the time was selected. Almost 20 years later, the choice of design continues to perform well vis-à-vis the competition. The Gothenburg paint shop is among the top three in Europe and emits a mere 15 grams of solvents per square metre of painted car body. The average value for Europe's combined body paint shop units is about 40 grams. The company's aim is to retain this position, irrespective of where in the world we establish new operations.

## Logistics reduce transport

Every year, hundreds of thousands of tons of production material are transported into Volvo Cars' plants and hundreds of thousands of finished cars, spare parts and accessories are delivered to dealers. To reduce the climate impact from such goods transport operations, the company is working actively on logistics solutions to reduce its carbon emissions.

**-57%**  
REDUCTION IN CARBON DIOXIDE EMISSIONS SINCE 2005

**Each year, 1.3 million people die in traffic – the vast majority in the Third World. Volvo Cars' aim is to build cars that do not crash. Already by 2020, nobody is to be injured in a new Volvo car.**

# INTERACTION OF CAR AND DRIVER SKILLS

Volvo Cars – which has safety as a core value – sells cars worldwide and is keenly aware that the car's system must function in widely differing environments and situations. Thus the cars are modified to meet real conditions, and not just those of the laboratory.

"Volvo is a small brand worldwide. We can't unilaterally create an accident-free traffic environment, but our role is to work at the forefront of safety programmes," says Anders Eugensson, safety expert at Volvo Cars.

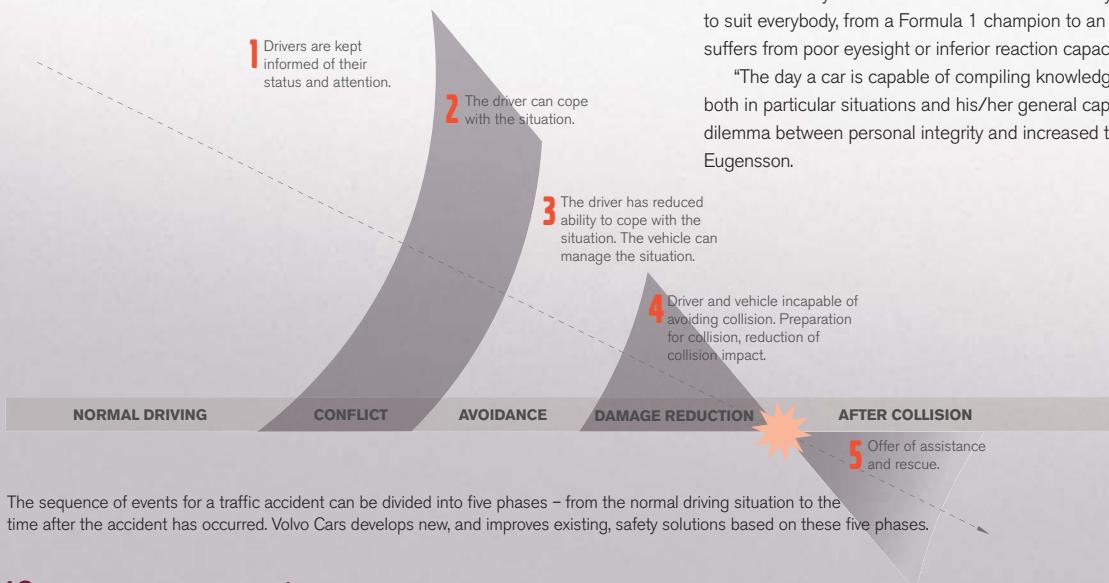
Using a systematic and targeted approach, the company's safety experts have consistently presented innovations in car safety. First out was the three-point seat belt, the Volvo innovation that has saved most lives, and remains the absolutely most important safety feature in all cars. Along with high speed and drunk driving, unused seat belts are the most common factor in fatal accidents.

## Driver's behaviour

Nowadays, crash safety in a Volvo car is particularly advanced. Today's Volvo cars provide warning signals to drivers who are too tired, drive unwittingly outside their lane, or have a car at a blind angle. Volvo Cars invests a great deal of time and considerable resources in understanding how drivers actually think.

"More than 90 percent of all accidents are due to the human factor. The more knowledge we have about the driver, the more we can do to prevent accidents," says Anders Eugensson.

## FIVE PHASES OF THE ACCIDENT SEQUENCE



**“ MORE THAN 90 PERCENT OF ALL ACCIDENTS ARE DUE TO THE HUMAN FACTOR. THE MORE KNOWLEDGE WE HAVE ABOUT THE DRIVER, THE MORE WE CAN DO TO PREVENT ACCIDENTS.**

**ANDERS EUGENSSON, SAFETY EXPERT VOLVO CARS**

The guiding principle for Volvo Cars' safety work is to avoid conflict situations and accidents. This is a task that nowadays involves a series of systems in the cars and insight regarding the driver. In the future, the system can be customised to match the driver's general capacity as a vehicle operator.

## The car signals and brakes

Volvo Cars' safety experts are attempting to learn to gauge the driver's overall capacity. The acute capacity in a given situation is monitored continually. If the driver does not react in an emergency situation, the car's safety system responds by warning, preparing and, finally, braking automatically.

If the safety experts knew more about each driver's ability to drive, they would be readily able to customise cars. The car's systems could be modified to suit everybody, from a Formula 1 champion to an elderly driver who perhaps suffers from poor eyesight or inferior reaction capacity.

"The day a car is capable of compiling knowledge of the driver's skills level, both in particular situations and his/her general capacity, we'll be faced with a dilemma between personal integrity and increased traffic safety," says Anders Eugensson.



## Active safety systems prevent accidents

### The human factor

There are different ways of gauging a driver's capacity. One common method is to measure how long the driver looks away and how often. In the case of a driver with low capacity or one that is clearly distracted, the car can give an earlier warning, reverse or increase the brake pressure earlier when a critical situation arises. The safety level is approaching the autonomous stage at which the vehicle takes over much earlier in a critical situation. And that is good in view of the fact that more than 90 percent of all accidents are due to the human factor. Volvo Cars does not believe that better driver training is required.

"We can't educate the problems away. Driver training is important but we believe that the level we have reached in Sweden, for example, is about as good as one can reasonably attain," says Anders. "All drivers can be distracted or have a bad day. There is no training in the world that can make them better drivers, it's a matter of having systems that can assist."

Volvo Cars' zero vision entails that minor errors should not lead to drastic consequences. Conscious infringements, such as driving at 180 km/h through a housing area, cannot be covered by the traffic system. But regular natural mistakes should not lead to drastic outcomes.

### Safer traffic environment

In addition to developing safe cars and attentive drivers, Volvo Cars is also focusing on creating a safer traffic environment. Various technical solutions permit the car to be updated with the latest information on the surroundings. For example, the highway infrastructure can assist by signalling where there are queues and road works underway, where there is a risk of skidding or whether you are driving on an accident-prone road and should drive very carefully. In an emergency situation, however, infrastructure and the vehicle cannot communicate and the vehicle must take over.

Over time, the high-tech safety features of luxury class vehicles will also be introduced into the mass market cars. The safety system will move from being an extra to being a standard feature with the passage of time. Eventually safety systems will also be part of a budget car. ABS brakes are a good example of this.

With record low traffic fatalities in Sweden in 2010, the lowest in a hundred years, it is easy to believe that the situation is in hand. But from a global perspective, the fatalities curve worldwide has only flattened out but not declined. Between 1.2 million and 1.3 million people die in traffic each year, most of them in the developing countries. Comparing this with the aviation industry, this is equal to the crashing of seven Boeing 747s each day, all year round.

Pedestrian Detection with Full Auto Brake is a pioneering technical solution. It can detect a pedestrian who walks out in front of a car, then warn the driver – and automatically activate full braking power if the driver does not react in time.

Using this technology, Volvo's automatic braking system moves from 50 percent to full braking power. In an emergency situation, the driver first hears an audio signal combined with a blinking light in the windscreen's heads-up display. The car's brakes are pre-charged at that moment. If the driver does not react to the warning and an accident is imminent, full braking power is automatically activated. The system uses information from both radar and an advanced camera to identify human shapes in movement patterns.

Pedestrian Detection with Full Auto Brake can avert a collision with pedestrians at speeds up to 35 km/h if the driver does not personally react in time.

At higher speeds, it's a matter of slowing down the car speed as much as possible before a collision. This reduces the risk of serious injury. If the speed declines from 50 to 25 km/h, the pedestrian's chance of surviving rises by up to 85 percent.

Pedestrian Detection with Full Auto Brake has been launched for the Volvo S60/V60 and is progressively introduced in the other Volvo models.



# Successful road train test

The initial test of a road train at Volvo's test track provided positive results. A truck acted as the lead vehicle and a passenger car followed behind without the driver personally steering, braking or accelerating.

Volvo Cars is participating in the EU Sartre project in which seven companies in four countries are developing systems for road trains, or platooning. At year-end 2010, all component systems were combined and test driven in real vehicles.

Representatives from the participating companies were satisfied with the results on the test track. The next step is to build and develop more vehicle road trains and ensure that more vehicles can drive faster and even closer to each other.

For Volvo Cars, the road train is a further development of the existing Adaptive Cruise Control system, in which the car itself keeps its distance and can brake. To this is added automatic steering and a number of communication systems, which, among other features, can ensure that the lead truck has contact with the vehicles behind.

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THE TECHNOLOGY HAS BEEN DEVELOPED  
FOR THE MOST PART. WE'RE NOW  
STUDYING THE BUSINESS POTENTIAL  
AND THE POSSIBILITY TO OFFER  
ADDED CUSTOMER VALUE.

ERIK COELINGH, TECHNICAL EXPERT

**Volvo Cars is reporting responsibility issues for the tenth consecutive year, and for the past three years in the form of an integrated corporate report featuring sustainability. Volvo Cars is positive to the progress towards greater transparency and comparability in work involving sustainable development.**

# TRANSPARENCY AND COMPARABILITY

For Volvo Cars, it is important to be reliable and live up to being a visionary company with sound ideas. Volvo Cars gives its explicit support to several important international initiatives aimed at fostering conditions for increased clarity in the company's sustainability efforts and sustainability reporting. The two initiatives below, and regular dialogues with stakeholders, provide the basis and guidelines needed to conduct diligent and appropriate sustainability efforts.

## Global Reporting Initiative

Global Reporting Initiative (GRI) is an independent institution that develops global guidelines for sustainability reporting. The guidelines are voluntary and are developed on an ongoing basis in dialogue with stakeholders. Volvo Cars applies and complies with GRI's international standards, which helps ensure transparent and clear accounting based on content that is important to stakeholders. Volvo Cars conducts its accounting in accordance with GRI's third-generation guidelines G3 at the B level, which means that a number of criteria for strategies and profiles are accounted for, along with at least 20 outcome indicators, of which at least one shall come from each of the following areas: economy (EC), environment (EN), labour (LA), human rights (HR), social responsibility (SO) and product responsibility (PR). A GRI index and a full GRI report are available on Volvo Car Corporation's website: [www.volvocars.com/sustainability/GRI](http://www.volvocars.com/sustainability/GRI)

## Volvo Cars supports Global Compact

The Global Compact also sets requirements for increased transparency. Volvo Cars was one of the first companies to sign the Global Compact, the UN's initiative for companies to promote human rights, good working conditions, taking responsibility for the environment and fighting corruption. Volvo Cars also participates in the Global Compact Nordic Network, an association of Nordic companies that meets regularly to discuss and share experiences within the framework of the Global Compact's ten principles.

## Significant issues for stakeholders

Volvo Cars bases its sustainability efforts on an active stakeholder dialogue and regular follow-ups of issues that stakeholders feel are the most important, which is referred to as a materiality analysis. The results of the latest survey from 2009 show that the issues that stakeholders assign the highest priority are climate change and safety, along with fuel efficiency. Internal stakeholders make similar priorities, while emphasising financial results as a key issue. Water consumption is also a matter that is considered increasingly important. This is reflected in the fact that safety, the environment and profitability are the three principal areas in the sustainability report. Also, environmental responsibility in production was expanded to include water consumption. The stakeholders believe that Volvo Cars' stakeholder commitment is of even greater importance now compared with previous surveys.

# GLOBAL COMPACT'S TEN PRINCIPLES

## Human rights

### Principle 1

Businesses should support and respect the protection of internationally proclaimed human rights in their sphere of influence; and

### Principle 2

make sure that they are not complicit in human rights abuses.

## Labour standards

### Principle 3

Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;

### Principle 4

the elimination of all forms of forced and compulsory labour;

### Principle 5

the effective abolition of child labour; and

## Principle 6

the elimination of discrimination in respect of employment and occupation.

## Environment

### Principle 7

Businesses should support the precautionary principle as regards environmental challenges;

### Principle 8

undertake initiatives to promote greater environmental responsibility; and

### Principle 9

encourage the development and diffusion of environmentally friendly technologies.

## Anti-corruption

### Principle 10

Businesses should work against corruption in all its forms, including extortion and bribery.

An open and constructive dialogue with our stakeholders is central to Volvo Cars continued success. Each stakeholder contributes new perspectives and expectations that the company strives to consider and balance to the greatest possible extent.

# STAKEHOLDER DIALOGUE DRIVES DEVELOPMENT



“

**IT WAS IMPRESSIVE TO SEE HOW MUCH VOLVO IS COMMITTED TO SUSTAINABILITY AND FUTURE MOBILITY.**

**JENS HAUG, GREENMOTORSBLOG**

The objective is that each stakeholder group feels that it is heard and favourably received. An example is the company's sustainability issues, in which stakeholders have contributed to identifying the areas and aspects that they consider should be given priority in operations.

#### **Owners**

Volvo Cars reports back on a continuous basis to its principal owner, Zhejiang Geely Holding Group, and, through continuous dialogue, develops ambitions and focus in strategic areas, from customer relations and new models to future issues and sustainable mobility.

#### **Employees**

Volvo Cars pursues a creative, open and inclusive working environment, with substantial development opportunities. Routine employee surveys and employee discussions are important tools for listening and creating an open culture, which opens the way to continuous development.

#### **Non-profit organisations**

The dialogue with non-profit organisations provides additional perspectives and is an important source for identifying topical social issues. Partnerships with organisations that represent various interests promote a shared understanding of challenges facing society.

#### **Suppliers**

Suppliers are of considerable significance to Volvo Cars' successes and a central part of operations. Volvo Cars' social responsibilities include imposing clear demands on suppliers and supporting them in the implementation of high

standards in such areas as labour conditions and environmental care. Long-term cooperation encompasses training courses, follow-ups and other related activities.

#### **Research and universities**

In its efforts to remain at the forefront in technical and conceptual development, Volvo Cars conducts extensive research related to climate, environmental and social issues. Concurrently, the company participates in a number of research and knowledge projects and works to direct resources to those solutions that generate the best effect for society, the environment and the economy. Long-term sustainable solutions are based on active cooperation between industry and research.

#### **Authorities**

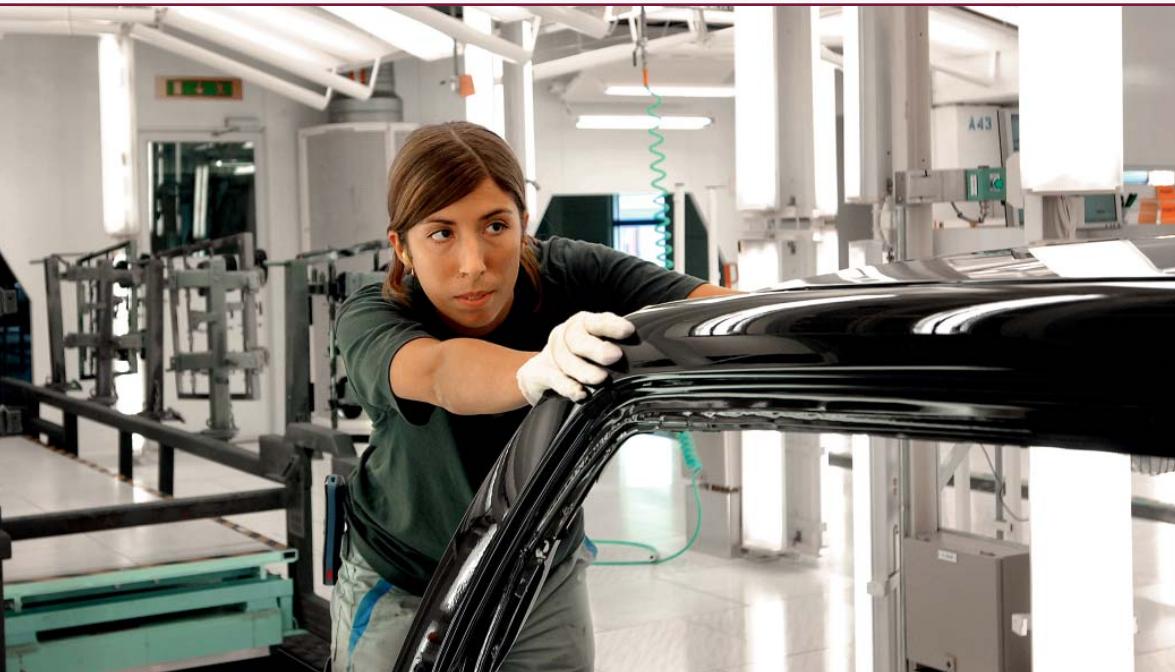
Overriding social issues that impact operations, including the environment and safety, require an ongoing dialogue with government authorities. An example is the long-term cooperation with the Swedish National Road Administration to jointly create the necessary prerequisites for improved traffic safety in the future.

#### **Customers**

Volvo Cars' most important task is to focus on people and design cars based on the customers' needs. This requires listening to customers, fulfilling their expectations and building life-long relations. The aim is to identify the wishes of both existing and potential customers.

**Volvo Cars has long been world leader in building safe cars. Moreover, fuel-efficient, eco-sound cars now account for more than 20 percent of the company's total sales – a successful development that provides scope for new ventures.**

# LEADING-EDGE EXPERTISE FOR TOMORROW'S CARS



“

**A CREATIVE ENVIRONMENT BREEDS NEW IDEAS THAT ARE CAPTURED AND INDUSTRIALISED THANKS TO INDIVIDUAL EMPLOYEES AND TEAMS RECEIVING THE REQUISITE SCOPE AND CONFIDENCE.**

**CECILIA NESSER, HEAD OF LEADERSHIP AND ORGANISATIONAL DEVELOPMENT.**

Some 1,200 employees are to be recruited, especially in product development.

More employees skilled in sustainable development are required. This applies not only to technical car design and fuels, but also to sustainable operations and efficient production.

#### Cross-discipline teamwork

Employee commitment and innovation are stimulated by the company's cross-discipline collaboration between the natural sciences, technology and design – which in turn has opened the way to innovations in focused areas such as the top-selling DRIVe family, plug-in hybrids and the all-battery driven C30 Electric.

"A creative environment breeds new ideas that are captured and industrialised thanks to individual employees and teams receiving the requisite scope and confidence. One example is DRIVe, for which a team was given the thumbs up to continue working with the challenge of attaining record-low carbon-dioxide emissions from our cars," notes Cecilia Nesser.

The car industry has recovered following the financial crisis. During 2010, Volvo Cars recruited 350 employees primarily in product development, in

addition to specialists. During the autumn a further 300 employees were recruited for production and customer service.

#### Diversity creates innovative ideas

As an employer, Volvo Cars offers a creative, open and inclusive work environment with major potential for individual development. This creates commitment, which in turn creates success such as the DRIVe family, that includes Sweden's top-selling eco-certified car in 2010.

2010 marked the launch of the 2010–2012 diversity plan, which encompasses activities for a respectful and inclusive environment, equal opportunities, brand and employer, products and offerings, and customers and markets.

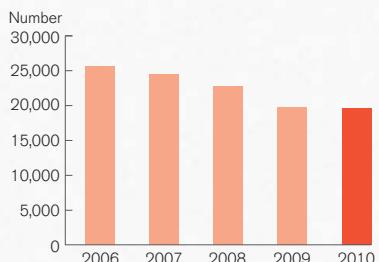
Involvement, which covers all employees, reflects our social responsibility as well as a purely business-like attitude, as Cecilia Nesser sees it.

"Both research and our experience confirm that non-homogeneous groups are more creative and make better-based decisions. So, we are focusing on activities that assist our leaders to remember the importance of differences in groups when they make their choice."

Volvo Cars is a driving force behind the Swedish branch of the Diversity Charter, a European business initiative in diversity that was founded in Sweden in 2010 by Volvo Cars, Scandic, Sodexo and others.

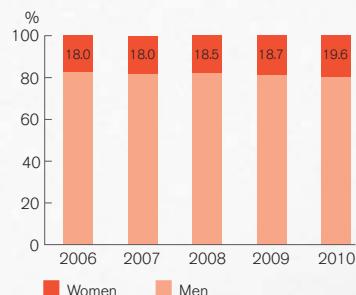
**84%**  
SATISFIED EMPLOYEES

EMPLOYEES (31 DECEMBER 2010)



**20%**  
FEMALE MANAGERS

NUMBER OF WOMEN IN SENIOR POSITIONS



#### Future leaders

"Generally, we seek enterprising people who are marked by creativity, involvement, customer focus and the right personal characteristics. But in particular we must be very focused on the employees we already have, give them the potential for development, good leaders, feedback, appreciation and a chance to exert influence. Few people leave the company if they are content and feel involved – that applies both to Sweden and other countries," notes Cecilia.

During autumn 2011, a new round of the Graduate Programme commenced. This three year development programme is aimed at identifying future leaders in marketing, sales, HR, production, product development, purchasing and finance. The 57 participants are recruited externally and work parallel with their participation in joint development activities.

"During the first year, you work in the business area that recruited you. Most of the participants also gain the opportunity to try other business areas or work internationally to gain a broader perspective," explains Cecilia.

Meanwhile, in China, Volvo Cars is planning to have employed a few hundred people already towards the end of 2011, primarily in product development and production preparation to secure local production capacity, not least in the new plant in Chengdu. In addition, recruitments will be made in areas ranging from purchasing to HR and finance.

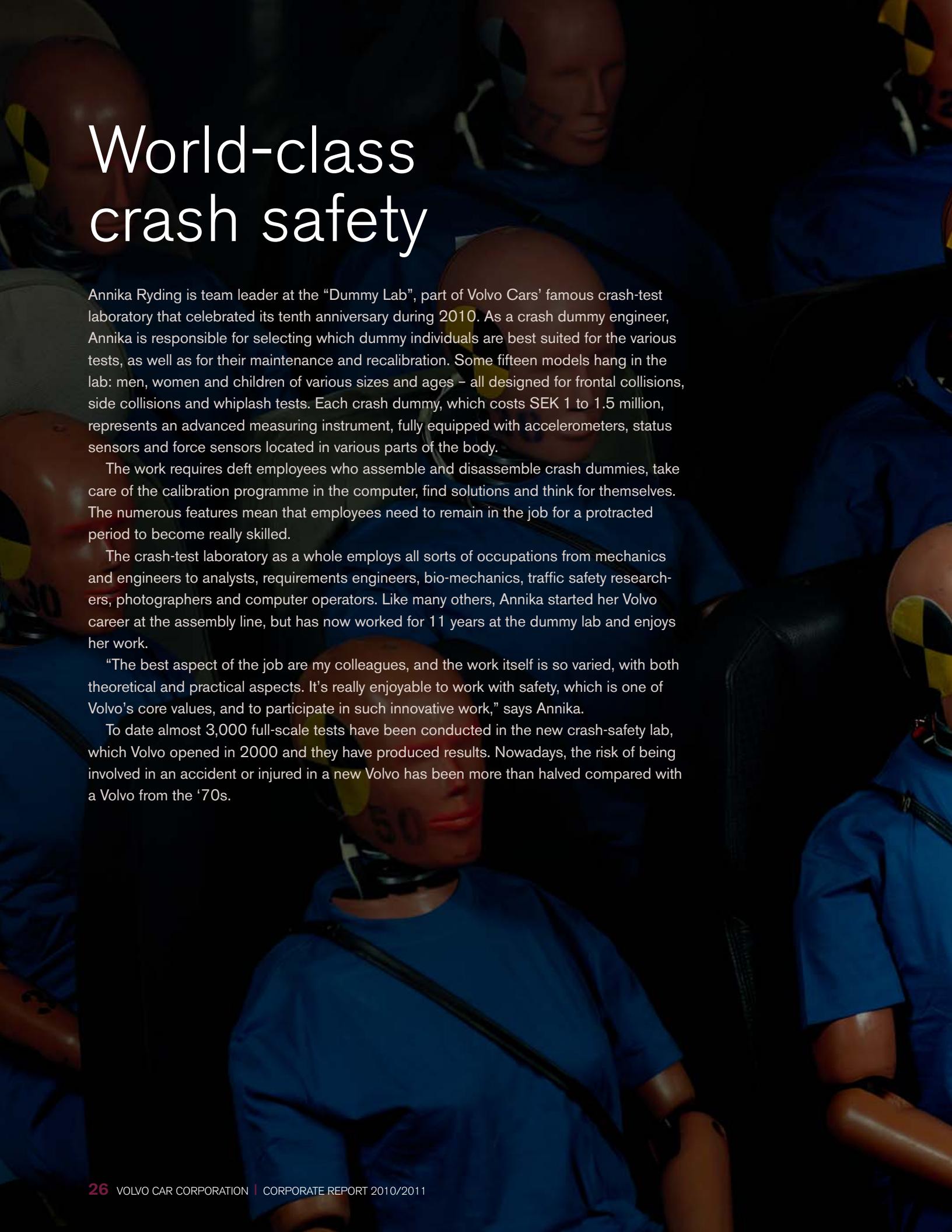
#### More employees are satisfied

The 2010 Attitude Survey showed that the proportion of satisfied employees increased to 84 percent (from 82 percent), which is the best result to date. The level of satisfaction in the different business areas varies, but the overall figures have risen. In particular, more employees are satisfied about how the company is generally managed, which is an incentive for the continuing improvement programmes.

"It is very pleasing that the result has improved in Production, where executives are responsible for larger groups than is otherwise the case in the company. We continue to focus on management development in, for example, communications and on using a coaching approach to highlight the potential in each employee and strengthen consciousness of the significance of dialogue," says Cecilia Nesser.

2010 saw Volvo Cars moving up the list of attractive employers drawn up by Universum, the employer branding company. The increase in popularity is reflected among students and young professionals alike.

# World-class crash safety



Annika Ryding is team leader at the "Dummy Lab", part of Volvo Cars' famous crash-test laboratory that celebrated its tenth anniversary during 2010. As a crash dummy engineer, Annika is responsible for selecting which dummy individuals are best suited for the various tests, as well as for their maintenance and recalibration. Some fifteen models hang in the lab: men, women and children of various sizes and ages – all designed for frontal collisions, side collisions and whiplash tests. Each crash dummy, which costs SEK 1 to 1.5 million, represents an advanced measuring instrument, fully equipped with accelerometers, status sensors and force sensors located in various parts of the body.

The work requires deft employees who assemble and disassemble crash dummies, take care of the calibration programme in the computer, find solutions and think for themselves. The numerous features mean that employees need to remain in the job for a protracted period to become really skilled.

The crash-test laboratory as a whole employs all sorts of occupations from mechanics and engineers to analysts, requirements engineers, bio-mechanics, traffic safety researchers, photographers and computer operators. Like many others, Annika started her Volvo career at the assembly line, but has now worked for 11 years at the dummy lab and enjoys her work.

"The best aspect of the job are my colleagues, and the work itself is so varied, with both theoretical and practical aspects. It's really enjoyable to work with safety, which is one of Volvo's core values, and to participate in such innovative work," says Annika.

To date almost 3,000 full-scale tests have been conducted in the new crash-safety lab, which Volvo opened in 2000 and they have produced results. Nowadays, the risk of being involved in an accident or injured in a new Volvo has been more than halved compared with a Volvo from the '70s.

“

EACH CRASH DUMMY, WHICH COSTS SEK 1 TO 1.5 MILLION, REPRESENTS AN ADVANCED MEASURING INSTRUMENT, FULLY EQUIPPED WITH ACCELEROMETERS, STATUS SENSORS AND FORCE SENSORS.  
ANNIKA RYDING,  
TEAM LEADER AT THE  
CRASH-SAFETY LAB

**Volvo Cars was integrated with Ford for more than ten years, which involved a joint organisation and shared work processes in many areas. Following its demerger from Ford, Volvo Cars now operates as an independent company and is reviewing its work processes – both internally and in relation to suppliers.**

# CLOSE COOPERATION WITH SUPPLIERS



“

**TO STRENGTHEN RELATIONS,  
THE 100 LARGEST SUPPLIERS  
WERE INVITED TO A SUPPLIERS'  
DAY, AT WHICH PARTICIPANTS  
MET THE MANAGEMENT TEAM  
AND TESTED THE NEW  
S60/V60 AND C30 ELECTRIC.**

The transition from Ford is progressing in stages. The organisation is continuing with its existing guidelines and will update them steadily during 2011.

#### New supplier portal

During spring 2011, a new supplier portal was launched, a website that enhances communications between Volvo Cars and its suppliers.

The portal provides suppliers with information on Volvo Cars' working methods, purchasing terms and conditions and overall operational requirements. This also communicates Volvo Cars' requirements, guidelines and expectations in such areas as the environment and social responsibility. This new tool permits rapid communication of news and key information for suppliers.

#### Long-term cooperation

Long-term cooperation with suppliers worldwide is of major importance for Volvo Cars' success. Currently, some 450 suppliers supply car components and approximately an additional 3,000 suppliers provide Volvo Cars with other products and services. Overall, some 70 percent of the car's value derives from suppliers.

Cooperation with suppliers commences frequently as early as the design stage for new models, as part of efforts to shorten lead times for development and construction.

During 2010, Volvo Cars arranged a number of activities to strengthen relations with its suppliers. One example was the "Suppliers Day", for which the company's 100 largest suppliers were invited to test-drive the new S60/V60 and C30 Electric, among other activities. Participants also took part in an information meeting with some of Volvo Cars' executive management. The primary focus was on quality, products, relations and growth.

#### Responsibility all the way

A responsible operation covers the entire value chain, of which the supplier stage represents a key link. Volvo Cars imposes high demands in terms of quality, product development, cost effectiveness, delivery capacity and environmental consideration. Fundamental requirements in relation to production suppliers include environmental certification according to ISO 14001 and quality certification pursuant to ISO TS 16949. Other areas include quality assurance of suppliers' manufacturing processes and the assessment of a supplier's delivery quality and delivery capacity.

#### GEOGRAPHIC DISTRIBUTION OF SUPPLIERS, 2010 (2009)



Volvo Cars' values as regards human rights and good working conditions are communicated in the form of very clear demands to suppliers. Since 2003, Volvo Cars has had a code of conduct regarding basic working conditions that is communicated to suppliers through the company's purchasing Terms and Conditions and the Social Responsibility Webguide. The code of conduct is based on the internationally recognised principles governing human rights in working life.

#### Training makes rings on the water

Volvo Cars supports suppliers in exercising conscious and responsible leadership. Via the former owner, Ford Motor Company, Volvo Cars has participated in a global training programme on the fundamental working conditions for suppliers. The purpose was to highlight the value of good working conditions and also to clarify Volvo Cars' expectations of suppliers.

In Volvo Cars' new role as an independent company, the company will continue to cooperate with other car manufacturers in this global training programme for suppliers.

The company also participates in an international network, whose purpose is to develop a joint approach to working conditions in the supplier chain.

## A supplier who focuses on the environment



Bridge of Weir, a Scottish company that supplies Volvo Cars with leather for car upholstery and interiors, has a zero vision, which means that waste that cannot be used in manufacturing must be recycled at the production site.

A major step was taken in this direction during 2010 when the company managed to halve its carbon-dioxide emissions by means of a completely new heat plant. Thanks to this plant, 30,000 tonnes of waste that the company produces annually was transformed into 45 million kWh hours of energy, which in turn is used to heat the company's facilities.

The heat and steam are used to dry and heat the leather. Oil, which is also derived from the leather fat, is used as fuel. The final residual product, mineral ash, is sold to the construction industry.

Since 2003, Bridge of Weir has had a biological treatment plant to handle its wastewater.

**SUSTAINABILITY FACTS**

	2010	2009	2008	2007	Trend <sup>1)</sup>	Comment
<b>CREATING VALUE</b>						
Customer satisfaction, rankings					A	
Fulfillment of customer satisfaction targets (%)	33	—	—	—	n/a	
Percentage of independent surveys in which Volvo Cars was ranked among the top five carmakers (%)	12	33	29	22	(-)	
Employee satisfaction (%)	84	82	n/a	80	(+)	
Total sales (retail deliveries)	373,525	334,808	374,297	458,323	(+)	B
Revenue – excl. special items (SEK million)	113,100	95,700	95,120	121,620	(+)	
Earnings before interest and taxes – excl. special items (SEK million)	2,340	-5,185	-9,493	-1,117	(+)	
<b>ASSUMING SOCIAL RESPONSIBILITY</b>					C	
<b>Product responsibility</b>						
Safety test results					D	
Share of independent tests where Volvo Cars received the highest rank (%)	88	80	70	69	(+)	
<b>Occupational health and safety</b>						
Health						
Sick leave per hours worked (%)	4.5	4.7	5.0	5.5	(+)	
Occupational injuries						
Number of injuries resulting in at least one day of sick leave per 200,000 working hours	0.6	0.5	0.9	1.5	(-)	
<b>Diversity and equal opportunity</b>						
Gender balance						
Share of women in leading positions (%)	19.6	18.7	18.5	18.0	(+)	
Equal opportunity						
Ratio of basic salary of women to men (blue collar; average for grade levels SG2-SG6)	0.790	0.994	0.947	n/a	(-)	
Ratio of basic salary of women to men (white collar; average for grade levels SG4-LL3)	1.010	1.034	1.027	n/a	(+)	
<b>Employment</b>						
Workforce						
Total workforce	19,494	19,650	22,732	24,384	(-)	
Turnover						
Rate of employee turnover	3.3 <sup>2)</sup>	12.8	9.2	9.1	n/a	
<b>Supply chain and human rights</b>					E	
Number of significant suppliers and contractors that have undergone screening on human rights	n/a <sup>3)</sup>	615	476	—	n/a	
<b>PROMOTING ECOLOGICAL SUSTAINABILITY</b>					F	
<b>Emissions from product</b>						
Fuel efficiency						
Fleet average CO <sub>2</sub> emissions in EU (g/km)	157	173	182	190	(+)	
Harmful emissions					G	
Share of Volvo cars sold complying with Euro 5/ULEV standards (%) <sup>4)</sup>	54	—	—	—	n/a	
Alternative fuels						
Number of alternative fuels cars sold	9,098	11,260	25,771	10,899	(-)	
<b>Energy use in car production</b>					H	
Total energy consumption in car production (MWh)	861,121	713,079	816,581	916,669	(-)	
(MWh/car)	1.61	1.71	1.59	1.42	(+)	
<b>Emissions from production</b>						
Total carbon dioxide emissions (tonnes)	67,585	58,980	68,367	126,735	(-)	
(kg/car)	190	158	151	311	(-)	
NOx emissions (tonnes)	85	71	90	101	(-)	
SOx emissions (tonnes)	<1	<1	<1	1	(=)	
VOC emissions (tonnes)	738	527	712	740	(-)	
(kg/car)	1.98	1.80	2.01	1.66	(-)	
Hazardous waste (tonnes)	9,087	5,594	9,320	11,395	(-)	
<b>Supply chain and environment</b>					I	
Share of the 500 largest suppliers, based on number of purchased articles, that are certified according to ISO 14001(%) <sup>5)</sup>	99.6	—	—	—	n/a	

1) Trend indicates our progress in terms of Volvo Cars' goals and vision.

A plus sign (+) indicates that the company is moving in the right direction toward our goals, while a minus sign (-) indicates that more needs to be done to develop in our desired direction.

2) 2010 only Sweden, formerly Sweden and Belgium.

3) Volvo Cars was previously covered by Ford's programme for the supplier reviews.

4) New metric replacing Euro4/ULEV.

5) New metric replacing the share of employees at ISO 14001 certified units.

# COMMENTS ON THE SUSTAINABILITY FACTS

## A. Customer satisfaction

It is ultimately the customer who assesses our performance and we gauge our customer satisfaction based on a broad market perspective that covers 44 independent studies in 11 of Volvo Cars' most significant markets. During 2010, we noted declining figures in the number of independent customer surveys in which Volvo Cars was ranked among the five top car brands, and thus during the year we also began to analyse the results and established goals of our work to improve the company's customer satisfaction. Volvo Cars' long-term goal is to be ranked among the five leading brands in independent market surveys.

## B. Sales

Following two difficult years, Volvo Cars reversed the negative trend and raised its sales 11.6 percent compared with 2009. Overall, Volvo Cars sold 373,525 vehicles during the year. In China, sales rose 36.2 percent and in Northern Europe by 29 percent. In the key US market, however, the downward trend continued, with Volvo Cars selling 7,474 fewer cars than in 2009, representing a decline of 12.2.

## C. Product safety

Volvo Cars' vision is a completely accident-free traffic environment and the goal for 2020 is that no one is killed or injured in a new Volvo car. To attain this vision, Volvo Cars is continuing its lengthy research tradition and its efforts to strengthen safety in and around its cars to achieve a safer driver environment and a collision-free future. Each year a large number of independent safety tests are conducted and Volvo Cars' objective with these tests is to be among the very best in its class. In 2010 Volvo Cars gained the top ranking in 59 of 67 tests completed, which corresponds to 88 percent of the tests. This represents an improvement of 8 percentage points compared with 2009 (when 56 tests were completed).

## D. Employee health and safety

Volvo Cars' work environment directive describes our work environment policy. One of Volvo Cars' objectives is to attain world-class status in terms of employee health and safety. Sickness absenteeism among Volvo Cars' workforce in Sweden and Belgium has declined steadily in recent years. During 2010, Volvo Cars attained the lowest level to date for sickness in the company, namely, 4.5 percent. Also, the company is continuing to monitor work-related accidents carefully and follows up all injuries in a bid to achieve improvements and avoid future accidents. During 2010, the company achieved a result of 0.6 LTCR (number of injuries resulting in at least one day of sickness absenteeism per 200,000 hours worked), which is actually very close to the 2009 level and lower than a year earlier.

## E. Supply chain and human rights

During the period 2003 to 2010, Volvo Cars participated in Ford Motor Company's global programme for the training and review of direct materials suppliers. Consequently, the reported data currently show the reviews conducted through Ford Motor Company. Since the change ownership of Volvo Cars in the mid-2010 financial year, work aimed at developing new processes has been in

progress. A new code of conduct was prepared during the year with guidelines that also apply to suppliers and a supplier portal was developed and launched in 2011. In addition, the company also completed internal training programmes focused on responsibility specifically aimed at the purchasing department.

## F. Fuel efficiency and alternative fuels

Volvo Cars' environmental programmes and its focus on the development of powertrains to reduce carbondioxide emissions are yielding results. The average emission levels for the company's car models in the EU declined from 173 to 157 grams of CO<sub>2</sub> per kilometre and will continue to fall during the years ahead as a result of continuing product improvements. One objective that Volvo Cars is working toward is that carbon emissions for the entire fleet are adapted to the EU's target of a maximum of 95 grams not later than 2020. Examples of efforts to achieve this objective are the current and future DRIVE models and the development of fuel-efficient technology. Looking ahead, the company's ambitious electrification strategy is in focus, including a test fleet of C30 Electric and the introduction of plug-in hybrids on the market in 2012.

## G. Environmental classification of products

During 2008 and 2009, information was presented regarding the proportion of cars sold that met the requirements of Euro 4. However, for 2010, Volvo Cars instead presents the proportion of cars sold that meet the more demanding requirements of Euro 5. The proportion of Volvo cars sold that met the requirements of Euro 5/ULEV during 2010 was 54 percent. ULEV is an abbreviation for Ultra-Low Emission Vehicle and is an environmental classification that applies in the US state of California and imposes more stringent emission requirements than Euro 5.

## H. Production and environment

Volvo Cars has an overarching objective of continuously reducing total energy consumption and our goal is to be climate neutral. All purchased electric power used by Volvo Cars in Europe derives from certified hydropower. Heating, which derives mainly from district heating facilities, originates largely from waste heat and biofuel. During 2010, total energy consumption from direct and indirect energy utilisation increased. This was primarily due to the uncommonly cold winter in Northern Europe and drastic rise in our demand for district heating. The increase in purchased energy for in-house consumption is mainly associated with more intensive vehicle production and the higher number of cars produced and sold. Overall energy consumption increases while energy consumption per vehicle decreased to 1.61 MWh/vehicle in 2010, compared with 1.71 MWh/vehicle in 2009.

## I. Supply chain and environment

Environmental work undertaken by suppliers is a quality issue and Volvo Cars seeks to ensure that the suppliers conduct such programmes as methodically as possible. For 2010, the company elected to gauge this directly by means of a key metric that is defined as the proportion of 500 largest suppliers, based on the number of purchased articles that are ISO 14001 certified. The company reached 99.6 percent in terms of this metric.

# MODEL RANGE



Stylish Sedans



S80



S60



S40



Luxurious SUVs/Crossovers



XC90



XC70



XC60



Versatile Wagons



V70



V60



V50



Charismatic Coupés/Convertibles



C70



C30

# THE PAST YEAR IN FIGURES

<b>Earnings before interest and taxes, SEK million</b>	
2010	2,340
2009	-5,185
2008	-9,493
2007	-1,117
2006	-296

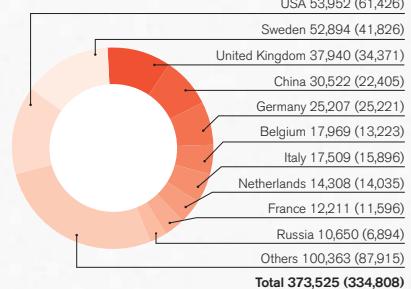
<b>Revenue, SEK million</b>	
2010	113,100
2009	95,700
2008	95,120
2007	121,620
2006	122,076

<b>Sales figures for past ten years, number of cars</b>	
2010	373,525
2009	334,808
2008	374,297
2007	458,323
2006	427,747
2005	443,947
2004	456,224
2003	415,046
2002	406,695
2001	412,390
2000	409,059

\* As of 2002, sales are defined as cars delivered to end customers.

<b>Sales by model, number of cars</b>			
	<b>2010</b>	<b>2009</b>	<b>%</b>
XC60	80,723	61,667	31
V50	56,098	54,062	4
V70	48,877	45,836	7
XC90	37,597	32,754	15
C30	35,981	32,409	11
S40	31,688	36,954	-14
XC70	22,068	18,032	22
S80	19,162	21,065	-9
S80L	11,778	7,106	66
S60	14,786	14,131	5
C70	10,158	10,792	-6
V60	4,609	—	—
<b>Total</b>	<b>373,525</b>	<b>334,808</b>	<b>11,6</b>

**The ten major markets 2010 (2009), number of cars**



The US is Volvo Cars' biggest market.  
In Sweden, Volvo has a market share of about 20 percent.  
Sales are defined as cars delivered to end customers.

**Sales per fuel type 2007–2010, number of cars**

	<b>2010</b>	<b>%</b>	<b>2009</b>	<b>%</b>	<b>2008</b>	<b>%</b>	<b>2007</b>	<b>%</b>
Petrol	146,695	39	147,544	44	179,350	48	262,622	57
Diesel	141,170	38	129,372	39	168,725	45	184,802	40
Methane* (Bi-fuel)	0	0	43	0	8	0	1,217	1
Bioethanol (Flexifuel)	9,098	2	11,217	3	25,763	7	9,682	2
DRIVe**	76,562	21	46,632	14	451	—	—	—
<b>Total</b>	<b>373,525</b>	<b>100</b>	<b>334,808</b>	<b>100</b>	<b>374,297</b>	<b>100</b>	<b>458,323</b>	<b>100</b>

\* The manufacture of Bi-Fuel cars ceased in 2007 owing to poor demand.

Modification may occur through an external supplier in some markets.

\*\* DRIVe cars are Volvo's series of fuel-efficient diesels cars with very low CO<sub>2</sub> emissions.

**Car production by model and plant 2010, number of cars**

	Göteborg	Uddevalla	Gent	Chongqing	Thailand	Malaysia	<b>Total</b>
S40	—	—	22,779	5,509	—	378	28,666
S60	—	—	27,579	—	—	—	27,579
S80	16,803	—	—	—	531	120	17,454
S80L	—	—	—	11,495	—	—	11,495
V50	—	—	53,982	—	—	320	54,302
V60	13,404	—	—	—	—	—	13,404
V70	48,585	—	—	—	—	—	48,585
XC60	—	—	83,529	—	—	141	83,670
XC70	21,156	—	—	—	—	—	21,156
XC90	36,375	—	—	—	240	96	36,711
C30	—	—	35,248	—	—	—	35,248
C70	—	9,532	—	—	—	—	9,532
<b>Total</b>	<b>136,323</b>	<b>9,532</b>	<b>223,117</b>	<b>17,004</b>	<b>771</b>	<b>1,055</b>	<b>387,802</b>

(Production in 2009: 311,413 cars)

**Number of employees**

	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>
Sweden	12,917 <sup>1)</sup>	13,928	16,573	17,616	18,212
Belgium (Ghent)	4,484	3,685	3,791	4,110	4,537
Thailand*	0	0	1	256	264
Malaysia	282	187	228	274	374
Market companies	1,811	1,850	2,139	2,128	2,163
<b>Total</b>	<b>19,494</b>	<b>19,650</b>	<b>22,732</b>	<b>24,384</b>	<b>25,550</b>

\* The production plant in Thailand was divested in December 2008.

	<b>2010</b>
1) Sweden	2,873
Torslunda plant	6,532
Gothenburg – Other	1,951
Skövde incl. Flöby	1,561
Olofström	12,917
<b>Total</b>	<b>12,917</b>

**1 Winnie Kin Wah Fok**

Director. Born 1956, from China. Has long experience of the finance sector. Currently employed as an advisor at Investor and is a Board member of SKF and G4S.

**2 Hans-Olov Olsson**

Vice-Chairman. Born 1941, from Sweden. Joined Volvo in 1966. President of Volvo Cars 2000–2005. Head of global marketing at the Ford Motor Company 2005–2006.

**3 Stefan Jacoby**

President & CEO. Born 1958, from Germany. Appointed in August, joining from Volkswagen in the US, where he was company president.

**4 Li Shufu**

Chairman of the Board. Born 1963, from China. Founder of Zhejiang Geely Holding.

**5 Håkan Samuelsson**

Director. Born 1951, from Sweden. President and Chairman of truck manufacturer MAN 2005–2009. Has also been head of Scania. Currently a member of the Board of Siemens.

**6 Lone Fønss Schrøder**

Director. Born 1960, from Denmark. Began her career with shipping company Møller-Maersk. President of Wallenius Lines, 2005–2010. Member of the Boards of Vattenfall and Handelsbanken, among others.

**7 Sören Carlsson**

Union representative (Unionen). Born 1964, from Sweden. Joined Volvo in 1985.

**8 Dr Herbert Demel**

Director. Born 1954, from Austria. Began professional career at Bosch in 1984. Has worked for companies including Audi, Volkswagen and Fiat. Since 2010, President of Magna in China, South-East Asia, India, Africa and South America.

**9 Glenn Bergström**

Union representative (IF Metall). Born 1955, from Sweden. Joined Volvo in 1974.

**10 Marko Peltonen**

Union representative (IF Metall). Born 1965, from Sweden. Joined Volvo in 1984.

**11 Björn Olsson**

Deputy union representative (IF Metall). Born 1963, from Sweden. Joined Volvo in 1981.

**12 Magnus Sundemo**

Deputy union representative (Akademikerna). Born 1954, from Sweden. Joined Volvo in 1979.

**13 Freeman Hui Shen**

Director. Born 1970, from China. Has worked for Borg Warner and Fiat. Currently director of Zhejiang Geely Holding, with responsibility for the company's international operations.

New member as of

10 November, 2010:

**Peter Zhang** (not featured)

Replaces F Shen as Director. Born 1966, from China.

**1 Jan Gurander**

Senior Vice President  
Chief Financial Officer

**2 Bernt Ejbyfeldt**

Senior Vice President  
Purchasing

**3 Peter Mertens**

Senior Vice President  
Research & Development

**4 Paul Gustavsson**

Senior Vice President  
Business Office

**5 Stefan Jacoby**

President & Chief  
Executive Officer

**6 Magnus Hellsten**

Senior Vice President  
Manufacturing

**7 Elisabet Wenzlaff**

Senior Vice President  
General Counsel

**8 Björn Sällström**

Senior Vice President  
Human Resources

**9 Lex Kerssemakers**

Senior Vice President  
Product Strategy & Vehicle Line  
Management

**10 Paul Welander**

Senior Vice President  
Quality & Customer  
Satisfaction

**11 Olle Axelson**

Senior Vice President  
Public Affairs

**12 Doug Speck**

Acting Senior Vice President  
Marketing, Sales & Service

**The first series produced Volvo car rolled off the production line in Gothenburg in 1927. Since then, Volvo Cars has delivered a steady stream of Volvo models equipped with world-leading innovations. Today, Volvo Cars is one of the best-known car brands in the world with sales in over 100 countries.**

# THIS IS VOLVO CARS

Until 1999, Volvo Cars formed part of Sweden's Volvo Group when the company was bought by Ford Motor Company. In 2010, Volvo Cars was acquired by the Zhejiang Geely Holding Group of China and the growth strategy is to establish China as the company's second home market. A new Chinese head office is located in Shanghai, a completely new plant is being built in Chengdu and the number of dealerships in the country is to double. In addition, the possibility of establishing a further plant in Daqing is being looked into.

In 2010, Volvo Cars sold a total of 373,525 cars, an increase of 11.6 percent. The company's best-selling model was the Volvo XC60 with 80,723 cars sold, of which 9,261 went to the US. This was followed by the Volvo V50 and V70 with 56,098 and 48,872 cars, respectively. In Sweden, almost every fifth car sold is a Volvo.

Relative to the strength of the brand, Volvo Cars is a comparatively small producer, with market shares of 1–2 percent in its main markets. The model range comprises sedans (S), versatile estates (V), SUV/Cross Country vehicles (XC) and coupés/convertibles (C). The largest market, the US,

represented some 14.4 percent of the total sales volume in 2010, followed by Sweden (14.2 percent), the UK (10.2 percent), China (8.2 percent) and Germany (6.7 percent).

Volvo Cars' head office, product development, marketing and administration are located in Torslanda, outside Gothenburg, in Sweden, where the largest assembly plant is located, as is the crash test centre. The Uddevalla plant in Sweden and the plant in Ghent, Belgium, manufacture the smaller car models.

In 2006, Volvo Cars commenced manufacturing in Chongqing, China, in a company owned jointly by the Chinese company run by Changan, Ford and Mazda – Changan Ford Mazda Automobile Corporation Ltd. Since the 1930s, Volvo Cars has been manufacturing engines in Skövde, Sweden and body components have been produced in Olofström, Sweden since 1969.

Sales are handled through approximately 2,300 local dealers. Most of the dealerships are independent companies. In addition to new-car sales, activities include the sale of accessories, workshop services, pre-owned cars as well as financial services. At the end of 2010, the Volvo Cars work-force numbered 19,494 employees, of whom 12,917 were employed in Sweden.

## Car production

Gothenburg  
Ghent, Belgium  
Uddevalla (Pininfarina Sweden)  
Chongqing (Changan Ford), China

## Design centre

Gothenburg  
Barcelona, Spain  
Camarillo, California

## Component manufacturing

Skövde  
Floby  
Olofström

## Assembly plants

Kuala Lumpur, Malaysia  
Bangkok, Thailand

## Head office, product development, marketing, administration

Gothenburg

## Employees (December 31, 2010)

19,494

Represented in about  
100 countries worldwide  
2,300 local dealers

## Volvo Cars' history

Volvo Cars was founded in Gothenburg, Sweden, in 1927 by the engineer Gustaf Larson and the economist Assar Gabrielsson. Mass production commenced the same year with the Volvo ÖV4, nicknamed the "Jakob", which rolled out from the production plant on 14 April. Since then, the company has produced over 15 million cars.

Car production	2010	%	2009	%
Gothenburg, Sweden	136,323	35.2	102,762	33.0
Uddevalla, Sweden	9,532	2.4	9,124	2.9
Ghent, Belgium	223,117	57.5	183,869	59.0
Chongqing, China	17,004	4.4	15,145	4.9

## Assembly plants

Malaysia	1,055	0.3	396	0.1
Thailand	771	0.2	117	0.1
<b>Total:</b>	<b>387,802</b>	<b>100</b>	<b>311,403</b>	<b>100</b>

**Contact us**

This is the tenth report on corporate responsibility published by Volvo Car Corporation. Our aim is to address areas and issues that are important for our stakeholders, and also for us as a company. We welcome feedback on the report and will gladly answer any questions you have regarding Volvo Car Corporation's sustainable development programmes.

You are welcome to contact us by e-mail:

[citizen@volvocars.com](mailto:citizen@volvocars.com) or

Telephone: +46 (0)31-59 00 00.

Contact person: Linn Fortgens,  
Director Sustainability & Financial Communication.

Volvo Personvagnar AB  
Public Affairs, Sustainability  
SE-405 31 Gothenburg, Sweden  
[www.volvocars.com/sustainability](http://www.volvocars.com/sustainability)





**VOLVO**

Volvo Personvagnar AB PA/PV 501252803-11 EN