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Guest Forum

## Volvo's Philosophy of the Preservation of the Environment

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# Volvo's Philosophy of the Preservation of the Environment



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<Experience>  
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## Introduction

Volvo has regarded the environment as a very important issue since 1972 We have defined environmental work as including the whole life cycle of the product as well as the total value chain. In order to minimise the environmental impact we have to understand how our activities affect the environment in the value chain areas including the various processes, products and transports related to each step in the value chain

In all its environmental work, therefore, Volvo has adopted a cradle to the grave approach in all its operations which, means incorporating the principal of Life Cycle Assessment (LCA) in the work We can no longer just look at the impact of the car on the environment when the car is produced or scrapped We have to acknowledge that the impact of the car on the environment is at its heaviest when the vehicle is being operated, in other words, when the customers are using the car Some might think that this is beyond the control of the car industry, but the truth is that we are the ones who set the parameters for the use of the car

## Where are we now on the “learning curve” of environmental impact?

In June 1995 Volvo Car Corporation (VCC) set up a course of environmental training for the whole company - the Dialogue on Environment The main purpose was for everyone to understand what the environmental problems are, especially those related to car industry.

### ボルボ社における環境保全の理念

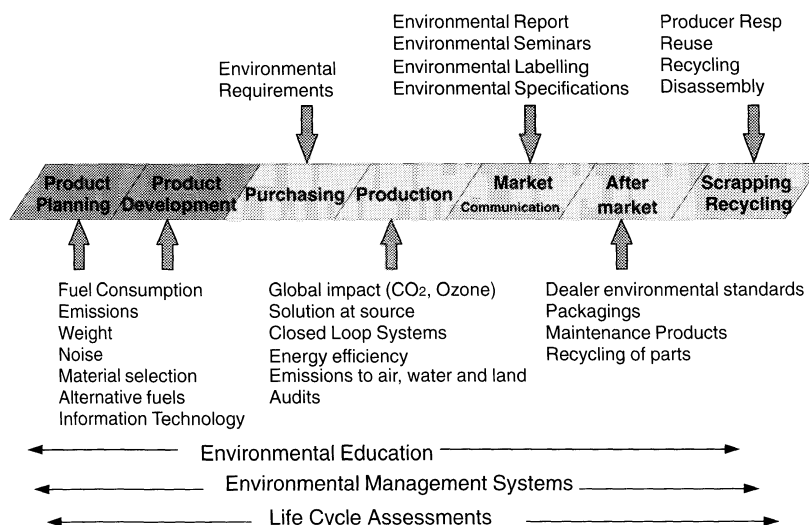
#### はじめに

1972年以来、ボルボは環境への対処を製品の全ライフサイクルを含む価値創成の一環と定義づけ、これら一連の価値創成に関連したさまざまな工程、製品、輸送が、いかに環境に影響しているかを理解するために、ライフ・サイクル・アセスメント(LCA)の原理を取り入れてきた。車の環境への影響が最も大きいのは、使用時、つまり製品が我々の手を離れ、使用者の手に渡ってからであるが、我々は、使用時に発生する環境事象の諸変数を決めるのは製造者の責任であるとの認識に立っている。

#### 我々は今、環境影響についてどの位知っているのだろうか？

1995年6月、ボルボ自動車会社(VCC)は全社的な環境教育のコース「環境についての対話」を設定した。主たる目的は、環境問題をすべての従業員が理解することであった。我々は品質不良と保証コストの関係、販売の落込みや顧客の不満には敏感に反応するが、環境への姿勢の悪さが直ちにそれらに反映するわけではない。我々は、従業員に対する環

## The Environmental Issue at Volvo 1997



We are used to giving importance to all aspects of quality performance including production, marketing and service. We can easily see the results of poor quality in high warranty costs, lost sales and dissatisfied customers. But this is not evident when it comes to environmental performance. Poor environmental concern does not immediately effect the cost account, the sales report or customer satisfaction report.

We believe that, at the turn of the century, a company in the forefront of environmental concern has invested in a good portion of basic environmental training for all employees.

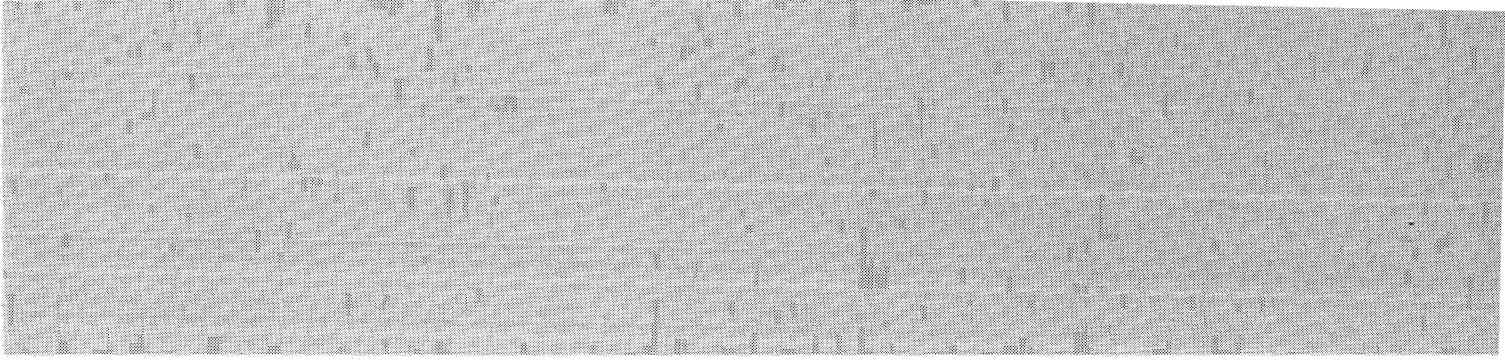
環境教育に十分な投資が必要であると考え、理解を実行に移すために、環境作業の改善継続を事業計画に組み入れる「ボルボ環境管理システム(VEMS)」を設定した。

### 環境－事業評価の新しい分野

自動車産業の環境対策は、会社の技術者と関係当局の折衝が主であった過去に比べて、事業計画として環境目標を達成しようとする今では、その多くがトップの議題である。環境は経済に関係しており、いかに注目を引き重要な事項と思われても、経済的な解決がなければその結果は悲惨である。我々はLCA手法を採用することが実施の道と考え、環境評価に5つの主題：生体の多様性考慮、人類の健康に対する価値、持続可能な生物学的再生産、次世代のための自然資源の確保、そして自然の美しさの保存、を基底においている。

### グリーン・マニファクチュアリング

環境問題の発生を避け、資源の使用を出来るかぎり少なくする生産プロセスの開発が、この問題の焦点である。多くの化学生成品が製品の材料として使われているが、その管理は實際上製造企業の責任である。我が社のMOTIVシステムは5千種の化学品についてその使用・管理を規定し、さらに、納入業者および契約者に対する「環境要求」を設定した。こ



Understand the problems is one thing but to doing something is another We have therefore established the Volvo Environmental Management System (VEMS) to ensure that we have an organised way of handling any environmental issue The VEMS will ensure that we continuously improve the environmental work within all our operations and make this publicly known.

## Environmental performance – a new area for business considerations

It can be said that environmental work in most of the car industry has been an issue between the companies' technicians and authorities However, environmental concern has increasingly become a permanent issue on the top management agendas Yesterday's periodical reports from the environmental manager on how production plants lived up to the requirements set by the local authorities give a sharp contrast to today's company-wide work to achieve the environmental goals set in the company business plan

In order to have everybody understand the impact on the environment of our products we believe it is essential that we use a well-known scientific method on which to base all our findings and integrate these findings into the ordinary business decision making It is important that environment and economy are related Interesting and important environmental findings but no economical solutions is a disaster both for ecology and economy We believe the way of doing this is by using LCA The LCA method is mostly used to compare two or more possible choices and today it has been partly integrated with the ordinary design and developing procedures

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れにより、すべての関連する人たちがその製品の全ライフサイクルについて、同等の高い環境基準に立って環境への影響を減少させることを期待している。

### 燃料消費／CO<sub>2</sub>

自動車産業に対する車の燃料消費削減要求は、地球温室効果に対する懸念の増大によって強化されて来た。我々は新しい概念に基づいて、軽量で再生可能な新素材、効率のよい動力系統と付属品の新開発、そして代替燃料の発見と使用についても関心を高めている。ヨーロッパでは地球温暖化をきわめて深刻にとらえ、多くの施策を実施し、大気中CO<sub>2</sub>量の安定化対策への提案を行ってきたが、ボルボは1990年から2005年の間にヨーロッパで売られる車の平均燃料消費を25%減少させることを表明している。

### エミッション

過去数十年、有害排出物の処理システムの改良が進み、間もなくそれ以上に有害排出物を減少させても、大気の質の改善には殆ど貢献しないほどになると予測される 新世紀に入る頃に販売される新しいガソリン車は、きわめて高効率の排気制御システムを装備し、これらの車からの排気は、汚染された都市の大気より清浄なものになるだろう。排気制御



We base our environmental valuations on five safeguard subjects Bio-diversity (a large bio-diversity reduces the risk of environmental disturbance), Human health (Good quality of life-healthy living and general well-being), Production (Sustainable biological production is necessary for long-term survival), Resources (The safeguarding of our natural resources to be used by future generations) and Aesthetic values (preservation of the beauty of nature)

## Green manufacturing

The main focus is on developing production and process solutions at the source i.e. avoid the creation of an environmental problem which would lead to heavy investments in after treatments and cleaning processes as well as using as few or as little of nature's resources as possible

One of the remaining challenges is to control the use and spreading of chemical compounds. The world knows of about 10 million chemical compounds today. About 100 000 of these are ingredients in chemical products frequently used in today's society. It goes without saying that it is an impossible task for the authorities to control the use of chemicals. It will therefore be up to the corporations to control the use themselves. We have developed our own system MOTIV which includes 5000 chemicals in production.

Another big challenge is to secure that all our suppliers hold, at least, the same level of environmental performance. Volvo has therefore developed Environmental Requirements on Suppliers and Contractors. We expect everybody to decrease the

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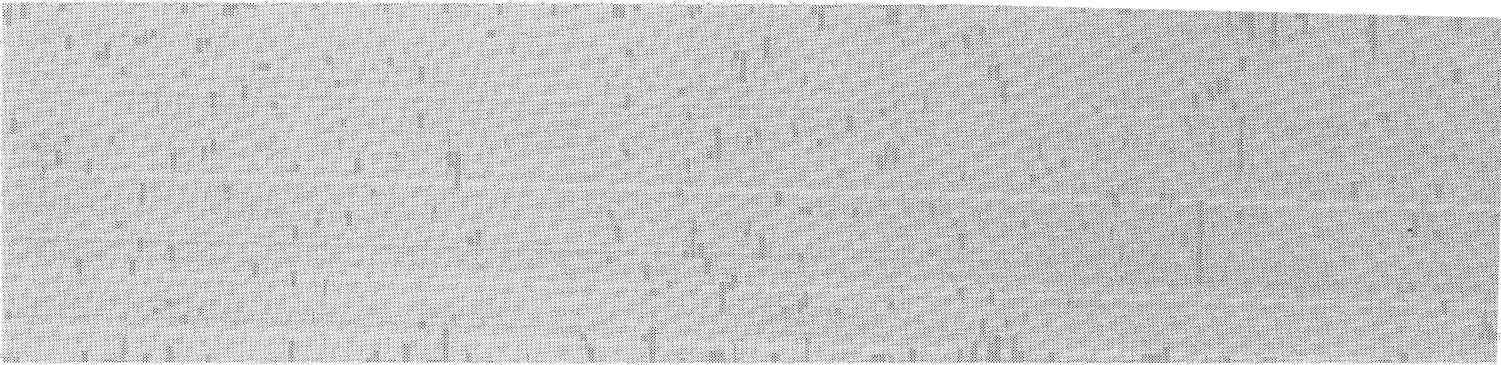
システムに欠陥のある車一台は新車百分のエミッションを排出することになることを考えると、車のライフタイムを通じたエミッションの管理こそ重要な課題である。

### 代替燃料

主な代替燃料は液化または高圧のメタン(天然/生物資源系ガス)、アルコール(メタノール/エタノール)、液化石油ガス(LPG)、植物系油(パーム オイル/菜種油-RME)、ジメチル・エーテル(DME)、それに電気である。ボルボの「代替燃料バンク」の原料抽出から燃焼に至る分析では、再生可能燃料がすべて環境的に無害ではない。ボルボが提示している二種燃料併用車(メタン/ガソリン)S70およびV70は、カリフォルニアのULEV規制に合致し、バイオガスおよび天然ガスでも走行する。

### リサイクリング

1980年代以来、捨て場面積不足が主な理由で車のリサイクリングが注目を浴びた。効率良いリサイクリング・システムは重量比で約75%を回収し、技術上100%回収も可能だが、環境的には大異変、経済的には狂気の沙汰である。ボルボの研究では、環境上のメリットはリサイクリングが最適レベルに達するまで増加、それ以上では減少する。リサイクルは



environmental impact of the full life-cycle of their products, from the cradle to the grave, comply with the same high environmental standard.

## Fuel consumption/CO<sub>2</sub>

The car industry is required to cut down on fuel consumption, which is a demand being intensified to a great extent by growing concern about the global greenhouse effect

As a consequence we can see new developments in respect of new concepts, the use of new lightweight and renewable materials, more efficient drive lines and accessories and increased interest in finding and using alternative fuels, both fossil, and renewable sources

There are different driving forces in different geographical areas behind this movement. Europe is taking global warming very seriously and number of measures have been taken and suggested in order to fulfil the commitment to stabilise the amount of CO<sub>2</sub> in the atmosphere

We at Volvo have made a commitment to reduce our average fuel consumption by 25% between the year 1990 and 2005 for the average car sold in Europe

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環境メリットに集中するのが賢明で、軽量の車がライフタイムを通じてより少ない燃料消費ならば、再生メリットが低い軽量材料を使用しても、環境上の影響は少なくて済む。EU委員会の95%回収要求は軽量材料の開発を抑制しはしないだろうか。

### 顧客の環境意識

車の顧客および消費者団体が、車が製造されるとき、使われるとき、廃棄されるときに環境影響について、製造者の説明を求める声はますます高まってくる。ボルボは自発的にその製品系列についての「環境仕様」を公表しているが、将来は車の環境性能についても公表の基準が決められることになるだろう。そうなれば、誰も環境に関する公共とのコミュニケーションを避けては通れない。それはボルボにとっても歓迎すべきことである。

(抄訳 編集部)





## Emissions

During the last decades the car industry has improved the after treatment systems to reduce harmful emissions. Harmful emissions will gradually decrease as we will soon be dealing with very small emissions and further reductions contribute very little to improve the quality of the air-which for a very long time to come will be affected by the properties of the existing (old) car fleet.

The emissions from new petrol cars sold around the turn of the century will have emission control systems that are so efficient that the polluted air in many European cities will actually be cleaned by these cars!

A car with a defect emission control system emits as much as one hundred new cars! It is extremely important to safe-guard exhaust emission control over the car's lifetime.

## Alternative Fuels

The main alternative fuels are liquified or compressed methane (natural gas or bio-gas), alcohols (methanol and ethanol), Liquified petrol gas (LPG), vegetable oils (palm oil and rapeseed oil-RME), dimethyl ether (DME) and electricity (from different sources).

Volvo has developed an Alternative Fuel Bank including all the phases, from the extraction of raw material to combustion of the fuels. This "cradle-to-the-grave" analysis is of great importance when it is being decided which alternative fuel to use today and tomorrow. Not all renewable fuels are environmentally sound from a holistic point of view. We can see that many alternative fuels originates from local interests and local solutions are developed. The challenge is to develop an alternative fuel, for all cars, which can be used world-wide like we today use petrol and diesel.

The dominant fuels in the near future will be further developed petrol and diesel qualities with a lower aromatic content, increased use of oxygenates and lower sulphur contents.

Today Volvo offers bi-fuel (methane and/or petrol) S 70 and V 70 cars to our customers. These cars meet the California ULEV emission level requirement and can run on both bio-gas and natural gas.





## Recycling

Recycling of cars is an issue that has been focused primarily in Europe since the late eighties. The original reason was the lack of landfill space. In most countries about 75 percent of the weight of the cars are recovered in well functioning recycling systems. It is the metals that are recovered due to their inherent value as recycled materials.

A car is technically feasible to recycle completely to one hundred percent. But this would mean an environmental catastrophe and economical insanity! Research carried out by, among others Volvo, clearly clarifies that the environmental gains increase when investing in recycling up to a certain optimum and then decrease.

It is essential to have the environment in focus when giving priority to what to recycle. Our research tells us that the total environmental gain is small on materials like plastic, rubber and glass. Our conclusion is that it is wiser to concentrate on recycling the materials that give the big positive environmental effects rather than on the materials which give high recycling results in terms of weight.

Future car will most probably contain a higher portion of light weight plastic material due to that the concern for lower fuel consumption. These plastic material will not all be suitable or possible to recover as material. We get lower environmental impact if a light-weighted car consumes less fuel over its lifetime than to get these light-weighted materials recovered as material. To demand, as proposed by the EU commission, 95 percent recycling as recovered material would therefore prevent promising light weight design materials to develop.

## Customers' environmental awareness

We can foresee a rapidly increasing demand from car customers and consumer organizations on the car manufacturers to describe the environmental impact of the car when it is produced, when it is used and when it is due for scrapping. Volvo has voluntarily published Environmental Specifications of our product range. In the future, we believe, there will exist developed standards for how to declare the environmental performance of a car. From then on it will be hard to get away with "green washing" in environmental communication to the public. Volvo looks forward to this development!



