A decade ago we embarked on a journey towards sustainable development. We did not know the exact destination or the nature of the trip. We began by addressing the most familiar part of the agenda - environmental responsibility and eco-efficiency.

A proactive environmental strategy was just the beginning of trying to understand what sustainable development might mean for the company. Our dialogues with environmental and consumer non-governmental organisations and others identified new issues that also seemed to fit an agenda of sustainable development. The ethical implications of genetic engineering and animal experimentation emerged as important topics to include in our learning process.

We realised that sustainable development is not just about the environment. It is also about people. Today, big international companies are often considered amongst the most powerful institutions in global society. We are expected to take greater responsibility for making sustainable development a reality. Defining this new role is not easy. But we know that it will include addressing issues such as human rights and taking an active role in creating better access to health. What used to be the responsibility of individual states increasingly become business’ responsibility, too.

To harvest the potential of our businesses, and allow them to meet their future challenges, Novo Nordisk demerged Novozymes at the end of 2000 and the Novo Group emerged. In this process we took the opportunity to refine the core values upon which the company has been built for the last 78 years.

Our core values, which define who we are and how we operate, are essential to our long-term success. Today, the Novo Group Charter includes a commitment to report on the Triple Bottom Line to document our environmental, social and economic performance.

We have also taken the opportunity to revise our corporate governance model. It now directs all boards of directors in the Novo Group to address the issues of our stakeholders in a triple bottom line perspective. The companies’ balanced scorecards serve the same purpose. We believe this makes good business sense and helps us understand trends in a rapidly changing global society.

Our journey does not end here. But we possess the experience, tools and commitment to meet future challenges in integrating sustainable development in the new companies.
The Novo Group today comprises Novozymes and Novo Nordisk, together with the investment and holding company Novo A/S. Following the demerger, Novozymes and Novo Nordisk are clearly positioned to capitalise on their individual strengths for the long-term benefit of shareholders, employees, customers and other stakeholders. The timing was right for such a step and the businesses are in excellent shape in terms of product development, human resources and financial strength. We are, however, convinced that even in a modern business environment, size is not everything. It is our actions, results and values that count.

The history of the Novo Group begins in the 1920s, with two Danish companies, Nordisk Gentofte A/S and Novo Industri A/S. Novo Industri was the world’s leading producer of enzymes for industrial use and Nordisk Gentofte produced insulin. In 1989, these two companies merged to form Novo Nordisk A/S. Following the merger, Novo Nordisk became a world leader in insulin production and diabetes care. The health care and enzyme businesses worked together sharing a strong interest in generating knowledge in the fields of fermentation, recovery and related biotechnologies.

Eventually, the differences between the two businesses widened and became more apparent than the interests shared. The two businesses operated in different markets and had different business cycles, as well as different financial and investment requirements – factors all leading to the recent demerger.

Ownership structure
The two operating companies in the Novo Group, Novozymes A/S and Novo Nordisk A/S, are both publicly listed Danish companies operating with an A and a B share capital structure. The B shares of Novozymes A/S are listed on the Copenhagen Stock Exchange. The B shares of Novo Nordisk A/S are listed on the stock exchanges of Copenhagen and London, and in the form of American Depository Shares (ADS) on the New York Stock Exchange.

Novo A/S
Following the announcement of the demerger plans in 1999, Novo A/S was founded. Novo A/S is an unlisted Danish public limited liability company, wholly owned by the Novo Nordisk Foundation. All A and B shares in Novo Nordisk A/S previously held by the Novo Nordisk Foundation were transferred to Novo A/S as of 31 December 1999, representing 25.1% of the total share capital and 69.7% of the votes.

Novo A/S is an investment and holding company for the purpose of managing the Novo Nordisk Foundation’s funds and investments in life science companies. Novo A/S helps drive and monitor the implementation of “The Novo Way of Management” in the Novo Group companies, including Triple Bottom Line accounting – the commitment to environmental, social and economic responsibility. Novo A/S employs 53 people.

Novozymes A/S
Novozymes A/S is a biotechnology-based world leader in enzymes. The company develops, produces and sells enzymes for
industrial use mainly in three market segments: technical enzymes for e.g. detergents and textile production, food enzymes for e.g. the alcohol, baking, brewing, and dairy industries and animal feed enzymes to improve the nutrient digestion and feed utilisation of animals. Novozymes is a pioneer in the industry, using a state-of-the-art biotechnology platform for the discovery and delivery of enzyme products. Novozymes is represented in 22 countries and sells its products in more than 120 countries. Most products are sold directly to industrial customers. The company employs 3,087 people, with a net turnover of DKK 5,033 million in 2000. It has production facilities in Denmark, Switzerland, the United States, Brazil, and China.

Novo Nordisk A/S
Novo Nordisk A/S is a health care company and the world leader in diabetes care. In addition, Novo Nordisk holds a leading position within the areas of blood coagulation disorders, growth disorders and hormone replacement therapy. Novo Nordisk manufactures and markets pharmaceutical products and services that make a significant difference to patients, the medical profession and society. Novo Nordisk is represented in 68 countries and sells its products in more than 120 countries around the world. It has production plants in Denmark, France, South Africa, the United States and Japan. The company, its affiliates and service companies Novo Nordisk IT A/S, Novo Nordisk Engineering A/S and Novo Nordisk Servicepartner A/S, employ a total of 13,752 people and had a net turnover of DKK 20,811 million in 2000.
This report, published in March 2001, covers the environmental and social performance of our production facilities worldwide. It also examines the social and bioethical issues which are important to the sustainable development agenda and public perception of the technologies we use.

Environmental and social data are collected and processed centrally on a regular basis. The data collection procedures are described in detail in the Internet version of the report. In 2001 a new data warehouse solution, CATCH, was introduced for compiling environmental and social data, thereby significantly improving data control.

Data for the production facility in Suzhou, China, is not included in the totals, but presented in the Internet version of the report along with the other production facilities within the Novo Group.

The Global Reporting Initiative
We have based this report on the Global Reporting Initiative (GRI) Reporting Guidelines. We also referred to these guidelines in our 1999 Environmental and Social Report, published in March 2000. The Novo Group participates in the development of the guidelines.

To facilitate your reading and comparability with other GRI reports we have prepared a cross-reference table between the GRI Guidelines and the current report. You will find this table in the Internet version of the report. See also www.globalreporting.org.

Independent review statements
The accuracy of the quantitative data has been verified by a formal external verification undertaken by Deloitte & Touche, while the assurance of the relevance and completeness of the report and its underlying processes has been verified by Simon Zadek, with the assistance of a panel of experts. Please refer to page 52 for statements.

This report is published in English and Danish printed versions. An English-language Internet version of the report presents additional information and site reports from the 12 largest production sites. Furthermore, we provide printed site reports for these sites, primarily for local employees and communities, published in the local languages. Hard copies can be ordered from www.novo.dk.

A summary of the report is available in English and Danish.
EXECUTIVE SUMMARY

With this year's environmental and social report, we recount how we intend to build on experience gained in the past decade of reporting. Even if the operating businesses take different roads in their pursuit of success, we still follow a common course towards sustainable development.

The Environmental and Social Report 2000 is structured into three main sections:

- **Our Future**
  This section describes our integrated approach to the sustainable development agenda, our corporate governance model and our learning processes. A Triple Bottom Line analysis is illustrated in a case study from the Novo Nordisk insulin plant in Clayton, North Carolina, USA. We describe our efforts to report on economics in a broader perspective. We report on our engagement with stakeholders to further dialogue on issues of common concern.

- **Our Lives**
  This section addresses our social responsibility strategy, including major challenges regarding employee retention and attraction. It also explores our role as a global corporate citizen in working to improve the right to health by our commitment to making health care affordable, available and accessible to all people. Furthermore, we include a case study on equal opportunities at the Novozymes production plant at Araucária, Brazil.

- **Our World**
  This section addresses our social responsibility in relation to the environment, genetic engineering, and animals. We also look at our progress in environmental impact accounting. A case study from the Novozymes plant at Franklinton, USA, describes the implementation of ISO 14001, now globally applied at all Novozymes production plants. We provide an example of how the new prototype systems for housing of some species of experimental animals which have successfully been removed from modified yeast, the organism used for the production of insulin.

Major achievements in 2000

- **CORPORATE GOVERNANCE**
  The Novo Group Charter was refined and new corporate governance structures introduced to ensure that activities are aligned with the core values and commitments.

- **ECONOMIC PERFORMANCE**
  The Triple Bottom Line approach was developed further with regard to more integrated economic reporting and analysis. The case study from the Novo Nordisk production facility at Clayton, North Carolina, USA, is a further step towards reporting on economic performance.

- **STAKEHOLDER ENGAGEMENT**
  Examples of stakeholder engagement in 2000 include Novo Nordisk CEO Lars Rebien Sørensen's meetings with patients, doctors, nurses and policymakers around the world. Other examples include a roundtable discussion with human rights experts as well as continuing collaboration with governmental, non-governmental organizations, and business and industry organizations.

**SOCIAL RESPONSIBILITY**

We concluded an external review of how the Novo Group relates to human rights which will help us direct our social responsibility initiatives. A pilot study on equal opportunity at the Novozymes plant in Brazil contributed to developing the strategy. We are considering how to address social considerations in the supply chain.

- **GLOBAL HEALTH POLICY**
  The overarching global issue of “the right to health” has been addressed through a series of initiatives.

- **ENVIRONMENTAL MANAGEMENT**
  ISO 14001 was implemented at all Novozymes production facilities. A case study from Novozymes North America in Franklinton, USA, shows how this also means sharing better practices with external stakeholders and raising employee awareness.

- **GENETIC ENGINEERING**
  At Novozymes, progress was made towards avoiding the use of antibiotic resistance marker genes in new genetically modified microorganisms. At Novo Nordisk, antibiotic resistance marker genes have successfully been removed from modified yeast, the organism used for the production of insulin.

- **ANIMAL WELFARE**
  In collaboration with the Danish Animal Welfare Society and animal welfare experts, Novo Nordisk developed new prototype systems for housing of some species of experimental animals which consider the animals’ basic needs.

Performance highlights

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>FINANCIAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net turnover (DKK million)</td>
<td>17,951</td>
<td>20,924</td>
<td>25,844</td>
<td>5,033</td>
</tr>
<tr>
<td>Operating profit (DKK million)</td>
<td>3,516</td>
<td>4,214</td>
<td>5,641</td>
<td>825</td>
</tr>
<tr>
<td>Profit before tax (DKK million)</td>
<td>3,740</td>
<td>3,951</td>
<td>5,545</td>
<td>705</td>
</tr>
<tr>
<td>Net profit (DKK million)</td>
<td>2,409</td>
<td>2,411</td>
<td>3,570</td>
<td>495</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water consumption (1,000 m³)</td>
<td>4,963</td>
<td>5,019</td>
<td>5,077</td>
<td>6,486</td>
</tr>
<tr>
<td>Energy consumption (1,000 GJ)</td>
<td>4,063</td>
<td>4,096</td>
<td>4,331</td>
<td>2,599</td>
</tr>
<tr>
<td>Eco-productivity index (EPI) for water</td>
<td>100</td>
<td>109</td>
<td>122</td>
<td>128</td>
</tr>
<tr>
<td>Eco-productivity index (EPI) for energy</td>
<td>100</td>
<td>109</td>
<td>117</td>
<td>115</td>
</tr>
<tr>
<td>Recycled liquid waste (1,000 m³)</td>
<td>1,231</td>
<td>1,144</td>
<td>1,231</td>
<td>1,110</td>
</tr>
<tr>
<td>Discharged liquid waste (1,000 m³)</td>
<td>3,011</td>
<td>3,244</td>
<td>3,168</td>
<td>2,047</td>
</tr>
</tbody>
</table>

| **SOCIAL** | | | | |
| Total no. of employees | 14,857 | 15,184 | 16,839 | 3,087 | 13,752 |
| Frequency of occupational injuries | 10.8 | 9.1 | 8.5 | 9.1 | 8.4 |
| Frequency of occupational illnesses | 2.1 | 1.9 | 2.0 | 3.1 | 1.7 |

* For a detailed overview with separate figures for Novozymes and Novo Nordisk, please refer to the financial overview on page 21. EPI is an eco-productivity index that relates the scale of production to the consumption of resources. An increase in the index is a positive trend.

NZ = Novozymes
NN = Novo Nordisk

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**ANIMAL WELFARE**

In collaboration with the Danish Animal Welfare Society and animal welfare experts, Novo Nordisk developed new prototype systems for housing of some species of experimental animals which consider the animals’ basic needs.

**GLOBAL HEALTH POLICY**

The overarching global issue of “the right to health” has been addressed through a series of initiatives.

**ENVIRONMENTAL MANAGEMENT**

ISO 14001 was implemented at all Novozymes production facilities. A case study from Novozymes North America in Franklinton, USA, shows how this also means sharing better practices with external stakeholders and raising employee awareness.

**GENETIC ENGINEERING**

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**ANIMAL WELFARE**

In collaboration with the Danish Animal Welfare Society and animal welfare experts, Novo Nordisk developed new prototype systems for housing of some species of experimental animals which consider the animals’ basic needs.
ENGAGED WITH STAKEHOLDERS

We shall seek an active dialogue with our stakeholders to help us develop and strengthen our businesses.

The Novo Group Charter
The Novo Group has long been committed to sustainable development, originally defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs. Each year, we build on the experience and lessons of the past. Today we measure our business performance through the Triple Bottom Line, which integrates environmental, social and economic aspects.

We continue to examine how our activities impact our companies’ role in a global context. Open and honest, accountable, responsible, ambitious, engaged with stakeholders, and ready for change; these are the signposts which guide our daily work as we strive to contribute to sustainable development.

Outside our walls, our performance has far-reaching impacts. As global corporate citizens, we hold ourselves responsible and accountable to society as well as to our employees, customers, and other stakeholders. Progressive companies must engage with a variety of stakeholders across national and international borders to help create the policies and actions that will shape the future sustainable development agenda.

The innovative use of biotechnology has the potential to help solve human health, environmental and industrial problems; but we are also aware of the controversy surrounding it. We firmly believe that the sensible use of this technology can contribute significantly to sustainable development. We want to provide input to the public debate and be constantly vigilant to our core values.

In this era of globalisation, companies are judged more than ever by their values. Viewing our business performance against the Triple Bottom Line helps us to manage business risks, to stay tuned to the concerns of society, and to spot opportunities and potential problems.

We do not pretend to have all the answers. The global sustainable development agenda is constantly evolving, and so are our attempts to put our values into action at local, national and international level. But we are committed to this journey and all that it can teach us.
The Novo Group is committed to continuous improvement in environmental, social and economic performance. The following table shows the Group’s targets for 2001-2002.

**NEW TARGETS**

<table>
<thead>
<tr>
<th>Company</th>
<th>Section</th>
<th>Target</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novo Group</td>
<td>OUR LIFE</td>
<td>Complete the initial review of social responsibility and develop a strategy for implementation</td>
<td>34</td>
</tr>
<tr>
<td>NOVOZYMES</td>
<td>OUR LIFE</td>
<td>Explore further the issue of the “inclusive labour market” in Denmark and formulate a company position</td>
<td>32-33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ensure that there is no increase in the frequency of occupational injuries and wherever possible continue to achieve reductions</td>
<td>www</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop business strategies for equal opportunities in the workplace</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Engage in dialogue with selected key suppliers and carry out pilot projects regarding social considerations in supplier/contractor evaluation</td>
<td>19</td>
</tr>
<tr>
<td>OUR WORLD</td>
<td></td>
<td>Document environmental considerations in the research and development process to ensure compliance with the Novozymes environmental policy</td>
<td>48-49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the eco-productivity for energy by 5 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the eco-productivity for water by 5 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further involve employees in the development of procedures and tools for environmental management globally</td>
<td>44-45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve methods for reporting transport emissions and use the results to reduce the environmental impact in cooperation with our transport suppliers</td>
<td>44-45</td>
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<tr>
<td></td>
<td></td>
<td>Complete the development of a tool to substitute antibiotic resistance markers for all GMMs used in production</td>
<td>48-49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Publish a peer-reviewed article on the environmental impact of the fertiliser NovoGro® made from biomass</td>
<td>48-49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop documentation for authorities to replace an in vivo test (the Draize test) with an in vivo model validated for enzymes</td>
<td>50-51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Develop an intra-nasal test in mice to be used instead of an intra-tracheal test in guinea pigs</td>
<td>50-51</td>
</tr>
<tr>
<td>NOVO NORDISK</td>
<td>OUR LIFE</td>
<td>Ensure that there is no significant increase in the frequency of occupational injuries at work and wherever possible continue to achieve reductions</td>
<td>www</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collect background information from each production unit and country on factors that have relevance to the number of accidents reported</td>
<td>www</td>
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<tr>
<td></td>
<td></td>
<td>Develop business strategies for equal opportunities in the workplace</td>
<td>34</td>
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<tr>
<td></td>
<td></td>
<td>Engage in dialogue with selected key suppliers and carry out pilot projects regarding social considerations in supplier/contractor evaluation</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investigate how Novo Nordisk can improve the health of people in the organisation</td>
<td>36-37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conclude and communicate the findings of the DAWN (Diabetes, Attitudes, Wishes and Needs) survey to uncover behavioural, social and psychological aspects of diabetes</td>
<td>36-37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Initiate the development of a “sustainable business model” for helping people with diabetes in poor countries gain access to diabetes care</td>
<td>36-37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assist in the development and implementation of national diabetes strategies</td>
<td>36-37</td>
</tr>
<tr>
<td>OUR WORLD</td>
<td></td>
<td>Increase the eco-productivity for energy by 4 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the eco-productivity for water by 5 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further involve employees in the implementation of ISO 14001 globally</td>
<td>44-45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve methods for reporting transport emissions and use the results to reduce the environmental impact in cooperation with our transport suppliers</td>
<td>44-45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue working towards the replacement and/or removal of antibiotic resistance marker genes in our production strains</td>
<td>48-49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish Novo Nordisk principles for the future use of human materials in drug discovery and development as part of implementing the Council of Europe's Convention on human rights and biomedicine</td>
<td>50-51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remove animal testing for the product control of 29 selected material codes</td>
<td>50-51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implement improvements in the housing conditions for experimental animals, considering the basic needs of the animals</td>
<td>50-51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formalise and further develop an internal ethical review process for experiments on animals</td>
<td>50-51</td>
</tr>
</tbody>
</table>
FOLLOW-UP ON TARGETS FROM 1998-2000

<table>
<thead>
<tr>
<th>Target</th>
<th>Progress</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUSTAINABLE DEVELOPMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-2001</td>
<td>Explore our impact on key stakeholders through a systematic dialogue</td>
<td>16-19</td>
</tr>
<tr>
<td>1999-2001</td>
<td>Investigate the relationship between the Triple Bottom Lines: the economic, the social and the environmental</td>
<td>22-25</td>
</tr>
<tr>
<td>2000</td>
<td>Develop a strategy for our future reporting activities in order to establish an integrated accounting and reporting framework for 2001</td>
<td>20-21</td>
</tr>
<tr>
<td>2000</td>
<td>Identify a minimum set of key performance indicators for values reporting</td>
<td>29</td>
</tr>
<tr>
<td><strong>SOCIAL RESPONSIBILITY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-2001</td>
<td>Expand the international coverage of social performance by reporting on Novo Group activities in countries beyond those covered in the 1998 cycle</td>
<td>22-25, 35, 46</td>
</tr>
<tr>
<td>2000-2001</td>
<td>Finalise the review of human rights initiatives in 1998 and integrate key principles into the policies of the companies in the Novo Group</td>
<td>34</td>
</tr>
<tr>
<td><strong>EMPLOYEES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Employee survey: The businesses to follow up on the survey and initiate necessary actions</td>
<td>31, 33</td>
</tr>
<tr>
<td>2001</td>
<td>Employee survey: Next employee survey to be carried out by Novozymes and Novo Nordisk</td>
<td>33</td>
</tr>
<tr>
<td><strong>HEALTH AND SAFETY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Develop tools for setting health and safety targets at international top management level and common guidelines for reporting</td>
<td>www</td>
</tr>
<tr>
<td>2000</td>
<td>NZ: Draw up global allergy monitoring programmes, all based on the same principles for screening and medical evaluation</td>
<td>www</td>
</tr>
<tr>
<td>2000-2001</td>
<td>Review health and safety data collection outside Denmark and explore an appropriate set of global indicators</td>
<td>www</td>
</tr>
<tr>
<td><strong>SUPPLIERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>Explore the prospects for introducing social considerations into supplier and contractor relationships</td>
<td>19</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL MANAGEMENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998-2000</td>
<td>Continue to assess the environmental impact of our products and processes</td>
<td>44-45</td>
</tr>
<tr>
<td>1998-2002</td>
<td>Integrate environmental issues into our management systems, including auditing of environmental issues</td>
<td>44-45</td>
</tr>
<tr>
<td>1999-2000</td>
<td>Further develop our site and corporate EPDs to include the finishing stage of production</td>
<td>www</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL PERFORMANCE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-2000</td>
<td>NZ: Improve the methods for reporting emissions from transport and use the results to reduce the environmental impact in cooperation with our transport suppliers</td>
<td>44-45</td>
</tr>
<tr>
<td>2000</td>
<td>Increase the eco-productivity for energy by 4 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td>2000</td>
<td>Increase the eco-productivity for water by 5 percentage points</td>
<td>40-41</td>
</tr>
<tr>
<td>1998-2002</td>
<td>No repeated breaches of regulatory limit values</td>
<td>42-43</td>
</tr>
<tr>
<td>1998-2002</td>
<td>No accidental releases of genetically modified microorganisms (GMMs)</td>
<td>42-43</td>
</tr>
<tr>
<td><strong>BIOETHICS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-2000</td>
<td>Develop procedures for monitoring the implementation of our corporate requirements for the use of and access to genetic resources in compliance with the convention on biological diversity</td>
<td>www</td>
</tr>
<tr>
<td>2000</td>
<td>NN: Further develop our ethical code of conduct in relation to the care and use of animals for experimental purposes</td>
<td>50-51</td>
</tr>
<tr>
<td>2000</td>
<td>NN: Continue working towards the removal and/or replacement of animal tests for the appropriate product approval and control</td>
<td>50-51</td>
</tr>
<tr>
<td>2000</td>
<td>NN: Implement the modifications of the yeast cream process in full-scale insulin production to ensure optimal degradation of the ampicillin resistance genes</td>
<td>48-49</td>
</tr>
<tr>
<td>2000</td>
<td>NZ: Expand the field monitoring of microbial flora in fields treated with the fertilizer NovoGro®</td>
<td>48-49</td>
</tr>
<tr>
<td>2000</td>
<td>NN: Further develop our ethical code of conduct for the use of human cells and tissues in drug discovery and development</td>
<td>www</td>
</tr>
<tr>
<td>2000</td>
<td>NN: Establish an internal ethical code of conduct as regarding gene therapy</td>
<td>www</td>
</tr>
</tbody>
</table>

NZ = Novozymes
NN = Novo Nordisk
Sustainable development and our use of biotechnology

A PATHWAY TO SUSTAINABLE DEVELOPMENT

In the Novo Group we believe that our use of modern biotechnology has the potential to make a major contribution towards sustainable development. But we also recognise that we must clearly address public concerns about how these technologies are used. This is part of the reason why we publish this annual report.

The application of genetic engineering enables us to produce a variety of active proteins: enzymes for industrial uses and various types of insulin for the treatment of diabetes, other hormones, and blood clotting factors for treatment of haemophilia.

The use of industrial enzymes often results in improved environmental performance for our customers while our pharmaceutical products provide significant social benefits. The latter accrue to both patients in terms of an improved quality of life and society in terms of more cost-effective treatment options.

Fermentation - our core technology

Most of the Novo Group’s products are manufactured by the fermentation of genetically modified microorganisms (GMMs) in closed tanks. For each product, we use a specific microorganism which is suited for producing that particular product. Our products do not contain GMMs as these are separated from the final products in the recovery process following the fermentation.

The main raw materials we use in our fermentation processes are renewable resources such as soybeans, sugar and potato starch. The main parts of the by-products we produce are nutrient-rich organic materials known as biomass, which is recycled as fertiliser and pig feed. Before being recycled the biomass is inactivated ensuring that all microorganisms are killed. We account for environmental in- and output on the inside cover, and on pages 48-49 we describe issues related to the disposal of the biomass.

Our basic production consumes large amounts of water, energy and raw materials. We continually optimise our production and recycling processes and thereby minimise waste disposal and environmental impacts. Pages 40-41 of this report contain a summary of how the Novo Group has performed over the past three years in terms of consumption of raw materials, energy and water. The Internet version gives a more detailed description of the production processes.

Gene technology ensures supply

Gene technology makes it possible to tailor organisms to be more specific and more productive than unmodified organisms. Modified organisms can be given the ability to produce valuable substances that would otherwise be in short supply or even impossible to produce.
Without genetic engineering, it would not be possible to provide a sufficient and stable supply of high-quality insulin or human growth hormone to the global market. Likewise, in the production of enzymes, we would be dependent on wild-type microorganisms with very low production yields, demanding increased amounts of raw materials, water and energy in production.

**Safety comes first**
In managing modern biotechnology, safety is always an important issue. National and international laws regulate our use of GMMs for production. The GMMs and the way we use them fulfill the widely adopted international criteria for microorganisms to be classified as safe or demonstrating the lowest potential risk. Every production facility has to be approved, and approvals are based upon scientific risk analyses made by the authorities. On pages 47-49 we describe safety measures and control.

**The right to know**
Much of the controversy surrounding the use of genetic engineering concerns the right to know. People want to know how, why, and when genetic engineering has been applied in manufacturing a product. Consumers want to be able to make informed choices. The Novo Group has a policy of stating openly which of our products are made by the use of GMMs. Novozymes’ approach to the use of biotechnology for food manufacturing is described on pages 48-49.

**The global perspective**
Biotechnology must prove its role in sustainable development by delivering products that meet society’s needs. Partnership and close dialogue with key stakeholders will be a prerequisite for ensuring that the technologies we use are approached from both an ethical, socio-economic and environmental point of view. On pages 48-49 we address some of the ethical issues related to our application of gene technology, and on pages 18-19 we give examples of stakeholder engagement.

In this report, we attempt to show how we integrate the environmental, social and economic aspects of our activities in decision-making. Our efforts mirror the global trend of integrating sustainable development issues into an increasing number of policy areas.

Eco-efficiency as an overall objective

Generally, economic growth in society has been closely linked to an increase in negative environmental impact. It is the Novo Group’s aim to avoid our growth leading to increased environmental impact. From the second half of the 1990s we have been able to gradually reduce the environmental impact of our production despite an increase in our net turnover.

The graph shows key elements of the Novo Group’s environmental impact from production compared to net turnover in the period 1994-2000. Global and regional environmental impacts from emissions of CO2 (carbon dioxide), SO2 (sulphur dioxide) and NOx (nitrous oxides), as well as waste disposal, are some of the most urgent problems on the international environmental agenda.
The Charter for the Novo Group is a common framework for guiding the activities of our companies. The Charter commits Novozymes' and Novo Nordisk's boards of directors to oversee continuous improvement of environmental, social and economic performance. Environment and bioethics committees and social responsibility committees in each company - headed by senior management - define policies, strategies and targets for environmental and social performance.

In addition, in 2000 Novo Nordisk has established a Health Policy Committee, headed by the executive vice president and chief operating officer, to develop the company's position and strategy on global health. See the article "The right to health" on pages 36-37.

Environmental and social reporting, including target setting and external verification, are central to the methodology set out in the Charter. Organisational audits help develop the organisation and management in line with market developments and business needs. Finally, facilitations assess compliance with the Charter’s requirements and ensure continuous improvements.

CORPORATE GOVERNANCE IN THE NOVO GROUP

Sustainable development is a key strategic priority of the Novo Group’s corporate governance structures. With the demerger, we have taken the opportunity to update our corporate governance systems as well as the Charter for the Novo Group.

The Charter for the Novo Group is a common framework for guiding the activities of our companies. The Charter commits Novozymes’ and Novo Nordisk’s boards of directors to oversee continuous improvement of environmental, social and economic performance. Environment and bioethics committees and social responsibility committees in each company - headed by senior management - define policies, strategies and targets for environmental and social performance.

In addition, in 2000 Novo Nordisk has established a Health Policy Committee, headed by the executive vice president and chief operating officer, to develop the company's position and strategy on global health. See the article "The right to health" on pages 36-37.

THE CHARTER FOR COMPANIES IN THE NOVO GROUP

The Charter consists of six criteria and the Novo Way of Management, which all present and future companies in the Novo Group must live up to.

- Company activities, practices and deliverables are perceived to be economically viable, environmentally sound and socially fair.
- The company is among the best in its business and a challenging place to work.
- Living the Novo values and business conduct principles as defined in the Novo Way of Management.
- Delivering competitive financial performance.

The Novo Way of Management describes our values, commitments, fundamentals and methodology. Present as well as future companies in the Novo Group must demonstrate willingness, ability and resolve to meet the following six criteria:
- Company products and services make a significant difference in improving the way people live and work.
- The company is perceived to be the innovator - in technology, in products, in services and/or in market approach.
Financial responsibility
We will work to continuously improve our financial performance by setting high objectives for growth and value creation and deliver competitive performance in these areas. We will maintain an open dialogue with our stakeholders and comply with international reporting standards.

Environmental responsibility
We will work to continuously improve our environmental performance by setting high objectives and integrating environmental and bioethical considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our environmental performance.

I We subscribe to the International Chamber of Commerce’s Business Charter for Sustainable Development.

Social responsibility
We will work to continuously improve our social performance by setting high objectives and integrating social, human rights and health & safety considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our social performance.

I We support the United Nations Universal Declaration of Human Rights.

ACCOUNTABILITY
Each of us shall be accountable - to the company, ourselves and society – for the quality of our efforts, for contributing to our goals and for developing our culture and shared values.

AMBITIOUS
We shall set the highest standard in everything we do and reach challenging goals.

RESPONSIBLE
We shall conduct our business in a socially and environmentally responsible way and contribute to the enrichment of the communities in which we operate.

ENGAGED WITH STAKEHOLDERS
We shall seek an active dialogue with our stakeholders to help us develop and strengthen our businesses.

OPEN AND HONEST
Our business practices shall be open and honest to protect the integrity of the Novo Group companies and of each employee.

READY FOR CHANGE
We must foresee change and use it to our advantage. Innovation is key to our business and therefore we will encourage a learning culture for the continuous development and improved employability of our people.

COMMITMENTS

1. Each unit must share and use better practices.
2. Each unit must have a clear definition of where accountabilities and decision powers reside.
3. Each unit must have an action plan to ensure improvement of its business performance and working climate.
4. Every team and employee must have updated business and competency targets and receive timely feedback on performance against these targets.
5. Each unit must have an action plan to ensure the development of teams and individuals based on business requirements and employee input.
6. Every manager must establish and maintain procedures in the unit for living up to relevant laws, regulations, and group commitments.
7. Each unit and every employee must know how they create value for their customers.
8. Every manager requiring reporting from others must explain the actual use of the reports and the added value.
9. Every manager must continuously make it easier for the employees to liberate energy for customer related issues.
10. Every manager and unit must actively support cross-unit projects and working relationships of relevance to the business.

VALUES

Accountable
Each of us shall be accountable - to the company, ourselves and society – for the quality of our efforts, for contributing to our goals and for developing our culture and shared values.

Ambitious
We shall set the highest standard in everything we do and reach challenging goals.

Responsible
We shall conduct our business in a socially and environmentally responsible way and contribute to the enrichment of the communities in which we operate.

Engaged with stakeholders
We shall seek an active dialogue with our stakeholders to help us develop and strengthen our businesses.

Open and honest
Our business practices shall be open and honest to protect the integrity of the Novo Group companies and of each employee.

Ready for change
We must foresee change and use it to our advantage. Innovation is key to our business and therefore we will encourage a learning culture for the continuous development and improved employability of our people.

FUNDAMENTALS

Financial responsibility
We will work to continuously improve our financial performance by setting high objectives for growth and value creation and deliver competitive performance in these areas. We will maintain an open dialogue with our stakeholders and comply with international reporting standards.

Environmental responsibility
We will work to continuously improve our environmental performance by setting high objectives and integrating environmental and bioethical considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our environmental performance.

Social responsibility
We will work to continuously improve our social performance by setting high objectives and integrating social, human rights and health & safety considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our social performance.

I We subscribe to the International Chamber of Commerce’s Business Charter for Sustainable Development.

I We support the United Nations Universal Declaration of Human Rights.

Companies in the Novo Group will use five specific follow-up methods to provide ongoing systematic and validated documentation of their performance regarding the Group criteria and the Novo Way of Management:

METHODOLOGY

- Financial follow-up and reporting
- Environmental and social reporting
- Organisational Audit
- Facilitations
- Succession Management
When the Novo Group first started addressing sustainable development, like many other companies we focused on environmental issues. Building on environmental compliance, a proactive environmental management strategy has provided us with a very useful method for integrating environmental management into our business decisions. We have used this experience to develop a “learning curve model” that has proved helpful in integrating new issues such as bioethics and social responsibility into our sustainable development agenda.

It is all about learning
We continuously add to the learning curve new issues that we as individual companies and as a Group need to consider. These new issues depend on trends in society and are often brought to our attention by stakeholders. The latest topic that has joined the Novo Nordisk’s learning curve is global health, which you can read more about in “The right to health” on pages 36-37.

The learning curve helps us chart progress towards sustainable development. It makes it easier to share best practices on how we are governing the issues. As an example, the Environment and Bioethics Committee has served as a model for Novo Nordisk’s new Health Policy Committee because we know that this approach works well.

Are we moving up the learning curve?
Environmental issues have been integrated into all relevant management decisions since the mid-1990s. We had our first external environmental management review in 1989, followed by the development of a proactive strategy, including stakeholder engagement and reporting. Since 1993 we have published annual environmental performance reports.

In 1996 the scope of the Environmental Committee was extended to include bioethical issues as well. Bioethical performance has been part of our reports since 1997. An external review of the company’s attitudes and handling of bioethical issues, including recommendations for improvements, was conducted in 1998 (see Environmental and Bioethics Report 1998).

In 1997 we carried out a major project to determine which topics we needed to address in a systematic approach to sustainable development. This resulted in the publication of our first annual Social Report in 1998. In 2000, new Social Responsibility Committees have been established in both Novozymes and Novo Nordisk. A review has been initiated to identify the strengths and weaknesses of the companies’ work in this area, including future strategies. This review will be completed in 2001.

In 1997 human rights was identified as a new focus area, due partly to the Novo Group’s global operations. An external human rights review was initiated in 1998. For the results of this review see “Working with social responsibility” on page 34.

For many years we have been developing indicators in the environmental area. More recently, we have begun to work with social indicators. During 2000, we initiated a project to refine our key performance indicators across the Triple Bottom Line (TBL).
The Triple Bottom Line

Environmental responsibility concerns our impact on the external environment as well as the bioethical implications of our activities.

Social responsibility is about improving the quality of relations with our key stakeholders. We define it as putting values into action in terms of human resources, human rights, health and safety and relationship with society at large.

We are now beginning to work in the area of economics as it relates to sustainable development. Each of the companies in the Novo Group will present their own financial reports, but to create more integrated TBL accounting we need to include economic aspects of our activities in the environmental and social report. Last year we began to investigate this topic with a TBL case at the Novozymes and Novo Nordisk production plant in Kalundborg, Denmark. This year we expand the idea further with a new TBL case on the Novo Nordisk insulin plant in Clayton, USA. See “Living the Triple Bottom Line” on pages 22-25 and “Developing the economic bottom line” on page 20.

The Triple Bottom Line in practice

Sustainable development is a complex concept involving all human activities. For businesses, it needs to be broken down into manageable parts so as to ensure progress. Therefore, we have identified six key processes that help the companies develop and implement environmental and social responsibility in practice.

- Actively involve employees at all levels
- Work internationally on environmental, bioethical and social issues
- Educate employees and provide them with the opportunity to investigate and reflect on environmental, bioethical and social conditions
- Define targets, review processes and report on progress
- Integrate environmental, bioethical and social considerations into management decisions to ensure that all decisions contain a balance of financial, environmental, bioethical and social perspectives and consequences
- Conduct dialogue and partnerships with stakeholders at a global, national and local level in order to promote openness to and an understanding of stakeholders’ views and expectations.

Novo Group learning curve

The chart illustrates progress of the companies in the Novo Group in relation to the five topics: environment, bioethics, human rights, social responsibility and global health. Global health is, however, only a relevant topic for Novo Nordisk. The overall vision is continued progress towards sustainable development.
Stakeholder engagement gives input to the Novo Group’s strategic thinking and planning. For instance, it was environmental non-governmental organisations (NGOs) that told us in the early 1990s that they wanted a voluntary report on environmental performance.

The Novo Group is one of many companies to realise that the relation between business and society is critical to long-term business success. This includes relations with all stakeholders, not just shareholders and customers. For us, this means that we must earn the trust of our stakeholders by engaging in an open and honest way.

We therefore believe in listening to stakeholders’ concerns and needs, thereby demonstrating that our values and those of our stakeholders are reflected in the company’s actions. If we disagree with a stakeholder group on a particular topic, we prefer to have an open discussion on the issue.

Awards
As an acknowledgement of our efforts, the Institute of State Authorised Public Accountants in Denmark and the Danish financial newspaper Børsen awarded the Novo Group the prize for “Best Sustainability Report” for the 1999 Environmental and Social Report.

In 2000, the first international benchmarking analysis of combined social and environmental reports was performed by the United Nations Environment Programme (UNEP) and the sustainable development think-tank SustainAbility. The study ranked BAA (British Airport Administration) and the Novo Group highest among the top 50 reports analysed.

Governance structures and internal learning processes are indispensable to sustainable development – and so is stakeholder engagement. Strong and healthy relationships are vital. This is as true in a village as in the global village.
Many forms of engagement

Through the years we have been mapping a number of stakeholder groups that are important to our existence. The chart illustrates the key stakeholder groups that we have identified. The arrows illustrate that there are relations between the Novo Group and its stakeholders, but also between the different stakeholders.

Our relationships with stakeholders take many forms, and each type of engagement is equally valuable to our continued existence. The main categories of engagement are described below:

- **Formal engagement.** Based on legislation and local and national regulations we engage with authorities in order to ensure compliance with regulations and other demands.
- **Dialogue.** Voluntary and proactive dialogue with individuals or stakeholder groups, such as neighbours of a production site, or other companies and experts.
- **Partnerships.** A deeper relationship in which we develop our thinking and practices in conjunction with key stakeholders. We work together on a common project, goal or task to produce a result.

**Partnerships with organisations**

The Novo Group has a long history of being actively engaged in partnerships with organisations working towards sustainable development. Here are some examples:

- **Business for Social Responsibility (BSR)**
  - [www.bsr.org](http://www.bsr.org)
  - BSR is a US-based global resource for companies seeking to sustain their commercial success in ways that demonstrate respect for ethical values, people, communities and the environment. The Novo Group is represented on the board of BSR.

- **The World Business Council for Sustainable Development (WBCSD)**
  - [www.wbcsd.ch](http://www.wbcsd.ch)
  - WBCSD is a coalition of some 150 international companies united by a shared commitment to sustainable development. The Novo Group is actively involved in projects regarding eco-efficiency, sustainability reporting and corporate social responsibility.

- **The Institute of Social and Ethical Accountability (ISEA)**
  - [www.accountability.org.uk](http://www.accountability.org.uk)
  - ISEA is a UK-based international professional body committed to strengthening the social responsibility and ethical behaviour of the business community and non-profit organisations. The Novo Group is represented on the Council of ISEA.

- **The Copenhagen Centre (TCC)**
  - [www.copenhagencentre.dk](http://www.copenhagencentre.dk)
  - TCC is an autonomous, international institution initiated by the Danish Government, focusing on social cohesion. TCC believes that voluntary partnerships between government and business are highly effective in creating social cohesion. TCC is chaired by Mads Ølsen, Chairman of the Novo Nordisk Board and former President and CEO of Novo Nordisk.
Engaging with environmental NGOs

The Danish Society for the Conservation of Nature (DN) is a private organisation that works on a wide number of issues concerning nature, our common environment, resources and consumption, and is a voice for the concerned public on these issues. DN and the Novo Group are engaged in a joint project on developing educational material with the objective of initiating a debate among older school children about gene technology. Common ground for DN and the Novo Group is the belief that knowledge, transparency and debate promote a sound climate of discussion regarding the use of genetic engineering.

Since 1996 the Novo Group and the World Wide Fund for Nature Denmark (WWF Denmark) have awarded grants to support Danish research projects on biological diversity. In 2000-2001, this cooperation was expanded with the addition of a biodiversity fund to help young Chinese researchers and environmental organisations investigate less well-known threatened species and ecosystems.

Novo Nordisk has collaborated with the Danish Animal Welfare Society to improve the welfare of experimental animals. See “Ethics guide our use of animals” on pages 50-51.

Sparring with employees

As part of the development of the Novo Group’s environmental and social reporting, a number of employees in the Danish companies were invited to an extended workshop. The employees were asked to challenge the report, expressing their needs and wishes for future environmental and social reporting. The workshop inspired a number of ideas, one of which is the publication in 2001 of a summary that briefly introduces environmental and social reporting to employees. Other ideas from the workshop will be further developed in future reporting.

The Novo Nordisk UK affiliate has been awarded the Investors in People standard (www.iipuk.co.uk). The standard is a prestigious award that recognises excellence in human resources. Two strong messages came through the assessment made by Investors in People: open and honest communication, and that staff felt they were valued members of the team.

Debating human rights

In 2000 we held a roundtable meeting with representatives from non-governmental human rights organisations and researchers within the field. The purpose of the meeting was to learn more about the link between human rights and business and to initiate discussion of the Novo Group’s approach. Ideas and reflections from the meeting will be integrated into our further development of social responsibility in the Novo Group. For a more detailed explanation of our approach to human rights, see “Working with social responsibility” on page 34.
Close relations with neighbours

Most of our production sites are located in communities with neighbours living close to the sites. An important task for these sites is to maintain a close relationship with their neighbours. At many of the sites, neighbours are invited to visit the site to learn about the production processes and their environmental impact. Some sites engage in local community activities. Other sites participate in local business groups in the community. See more details about community relations in the site reports in the Internet version of the report.

Collaboration with universities

We engage in many kinds of collaboration with universities worldwide. As one example Novo Nordisk has made an agreement with the Centre for Bioethics and Risk Assessment at the Danish Royal Veterinary and Agricultural University in Denmark to collaborate on specific projects. The projects will focus on public perception of the use of gene technology and transgenic animals and ethical aspects and welfare of experimental animals.

Get to know your customer

In 2000 Novo Nordisk sharpened its focus on customers and set the target that all employees have a minimum of one contact with a customer during the year. The customer could be a patient, doctor, nurse or other relevant customer. A series of seminars were arranged to give employees who do not normally have customer contact an overall view of diabetes and to educate them about the fears, hopes and needs of people with diabetes. Feedback from both customers and employees has been very positive. The activities will be continued as a routine part of induction programmes.

Meet your stakeholders

Lars Rebien Sørensen, CEO of Novo Nordisk, together with a team of colleagues held a series of meetings during 1999-2000 with patients, doctors, nurses and policymakers in more than 10 countries. This extensive worldwide dialogue yielded a great deal of insight about how various stakeholders view the company and what expectations they have for the future.

Social considerations in the supply chain

One of the most important issues raised in recent years is that of social responsibility in the supply chain. This is also one of the most difficult issues to tackle. One of the dilemmas is outlined below.

During 2000, the Novo Group has been working across the companies to explore how to apply social considerations in the supply chain, in accordance with our target: Explore the prospects of introducing social considerations into supplier and contractor relationships. We have reviewed best practices and experience from other companies and consulted our partners. The dilemmas are diverse and getting the balance right is a challenge.

For instance, there may be severe human and financial costs with a too rigid approach, whereby a contract is cancelled if the supplier does not meet the customer’s demands. On the other hand, policies should be supported by actions. The ideal goal is to influence suppliers positively, rather than penalise them.

With the dilemmas in mind, in 2001 we will engage in close dialogue with some of our key suppliers and contractors. We believe that their views will help us shape our approach to the issue before we involve all our suppliers and contractors. The outcome of this dialogue could lead to annual evaluation of the performance of our suppliers, as we are doing on environmental issues. Presently, we do not immediately cancel contracts in cases of poor environmental performance, but suppliers are strongly encouraged to improve their environmental procedures, and we are keen to discuss with them how to obtain improvements. No new contracts are signed with companies showing unsatisfactory environmental performance.

Geographical spread of first-line suppliers in terms of value

<table>
<thead>
<tr>
<th>Supplier location</th>
<th>Percentage of value of raw material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>63%</td>
</tr>
<tr>
<td>Africa</td>
<td>0%</td>
</tr>
<tr>
<td>Asia</td>
<td>6%</td>
</tr>
<tr>
<td>Australia</td>
<td>0%</td>
</tr>
<tr>
<td>North America</td>
<td>27%</td>
</tr>
<tr>
<td>South America</td>
<td>4%</td>
</tr>
</tbody>
</table>

The table above shows one of the characteristics of our supply chain. Both Novozymes and Novo Nordisk purchase most of their raw materials from those found in the developing world. The other hand, some of our suppliers are located in the developed world. We will therefore include suppliers from different continents in our project to reflect this difference.

Another characteristic is that we are small customers in some parts of our supply chain, which gives us less direct influence. However, we believe that engaging suppliers in discussion around these issues will help us achieve our objectives.
The economic component of the Triple Bottom Line is often assumed to be the same as financial performance. But there are significant differences. Finance concerns the market valuation of transactions that pass through a company’s books. Economics, on the other hand, is the means by which society uses human and natural resources in the pursuit of human welfare. As such, economics extends beyond the boundaries of a single organisation and is inextricably linked to both the environmental and social elements of sustainable development.

The financial performance of the companies in the Novo Group is reported in the corporate annual reports. Addressing mainly shareholders and financial analysts, they do not directly account for what is important to stakeholders in economic terms. For example, investments in training employees make an economic contribution by building national productive capacity. Yet, such information is not given in a traditional financial report.

Case studies account for benefits to society
We began to tackle the wider socio-economic aspects of our business in our 1999 Social and Environmental Report, looking at the broader impacts of our largest production site, Kalundborg in Denmark. In 2000, taking what we learned from this case study, we have developed a model that can be applied to other parts of our operations. As a result, a Triple Bottom Line study has been carried out at the Novo Nordisk operations at Clayton, North Carolina, USA, in which the economic bottom line is addressed more concretely. See pages 22-25.

One indicator for measuring economic performance is the level of financial wealth created by the company and how it is distributed across direct stakeholder groups such as shareholders, suppliers and employees. Some of this wealth is redistributed through tax contributions, with implications in the local community. Another indicator is the level of investments in tangible as well as intangible assets, such as for research and development, which in Novozymes constitute 12.6% and in Novo Nordisk 16.3% of net turnover. The case study also demonstrates how investments in training people at work have economic implications in the local community. As part of the economic balance, charitable donations are included as direct economic impacts.

An integrated approach
As publicly listed companies, the financial accounts for Novozymes and Novo Nordisk lay open detailed information on their corporate financial performance. This year, we have chosen to present an overview of key financial data. We recognise that these do not give a complete picture of our economic impact and our contribution to sustainable development.

The two case studies will be building blocks to a more systematic approach to accounting for economic performance in the Novo Group, at local and corporate levels. In doing so, it is our aim to be part of the international business community’s efforts to develop standards or guidelines for economic reporting.

THE NOVO GROUP CHARTER
The Novo Group Charter commits all present and future companies in the Group to strive to balance the Triple Bottom Line. This year, a case study analyses the economic impact of one of Novo Nordisk’s large production sites.
## Overview of the Novo Group’s Financial Performance 2000

### Profit and Loss Figures (DKK million)

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>1999</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net turnover</td>
<td>5,033</td>
<td>4,501</td>
<td>12%</td>
</tr>
<tr>
<td>Employee costs</td>
<td>1,334</td>
<td>1,296</td>
<td>3%</td>
</tr>
<tr>
<td>Research and development costs</td>
<td>645</td>
<td>607</td>
<td>6%</td>
</tr>
<tr>
<td>Operating profit</td>
<td>825</td>
<td>687</td>
<td>20%</td>
</tr>
<tr>
<td>Profit before tax</td>
<td>705</td>
<td>602</td>
<td>17%</td>
</tr>
<tr>
<td>Net profit</td>
<td>483</td>
<td>410</td>
<td>18%</td>
</tr>
<tr>
<td>Number of employees*</td>
<td>3,208</td>
<td>3,190</td>
<td>&lt;1%</td>
</tr>
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</table>

### Profit and Loss Key Figures

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>1999</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and development costs in % of net turnover</td>
<td>12.8%</td>
<td>13.5%</td>
<td>-</td>
</tr>
<tr>
<td>Operating profit margin</td>
<td>16.4%</td>
<td>15.3%</td>
<td>-</td>
</tr>
<tr>
<td>Net profit margin</td>
<td>9.6%</td>
<td>9.1%</td>
<td>-</td>
</tr>
<tr>
<td>Effective tax rate</td>
<td>31.3%</td>
<td>31.9%</td>
<td>-</td>
</tr>
</tbody>
</table>

### Balance Figures (DKK million)

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>1999</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash and current asset investments</td>
<td>996</td>
<td>1,072</td>
<td>(7%)</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>2,514</td>
<td>1,009</td>
<td>149%</td>
</tr>
<tr>
<td>Total assets</td>
<td>8,218</td>
<td>8,078</td>
<td>2%</td>
</tr>
<tr>
<td>Shareholders’ funds</td>
<td>3,771</td>
<td>3,350</td>
<td>13%</td>
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### Balance Key Figures

<table>
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<tr>
<th></th>
<th>2000</th>
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<th>Change in %</th>
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<tr>
<td>Equity ratio</td>
<td>45.9%</td>
<td>41.5%</td>
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<tr>
<td>Payout ratio</td>
<td>26.0%</td>
<td>-</td>
<td>-</td>
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<tr>
<td>ROIC</td>
<td>10.0%</td>
<td>8.4%</td>
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### Share data

<table>
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<tr>
<th></th>
<th>2000</th>
<th>1999</th>
<th>Change in %</th>
</tr>
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<tbody>
<tr>
<td>Earnings per profit per share in DKK</td>
<td>6.41</td>
<td>5.43</td>
<td>18%</td>
</tr>
<tr>
<td>Shareholders’ funds per share in DKK</td>
<td>50.08</td>
<td>44.41</td>
<td>13%</td>
</tr>
<tr>
<td>Dividend per share in DKK**</td>
<td>1.65</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Share capital (nominal) at year-end in DKK million</td>
<td>754</td>
<td>754</td>
<td>-</td>
</tr>
<tr>
<td>Market capitalisation in DKK million***</td>
<td>11,919</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Novozymes’ figures exclusive of Suzhou, China, are 3,087. All other data in this report is also exclusive of Suzhou.
** Dividend in 1999 is prior to the demerger.
*** A and B shares, assuming that A shares have same value as B shares.

The financial performance data is taken from the annual reports for 2000 from Novozymes and Novo Nordisk, respectively.
In a small community like Clayton in North Carolina, USA, the interrelation between all life becomes quite tangible. Employees are parents, taxpayers, voters, neighbours – in short, citizens. Being a responsible employer means taking local issues into account. Thus, one important way for Novo Nordisk to earn its licence to operate is to be an engaged citizen in the community.

This becomes particularly evident in the United States, where society expects private companies to take responsibility for local issues.

"Community involvement is expected," says Stuart McLeod, editor of the local newspaper, The Clayton News Star. "Companies' obligations extend beyond simply paying taxes and being responsible for their employees."

Meeting such far-ranging obligations is part of the Triple Bottom Line, which includes a company's environmental awareness, social responsibility and economic viability. To examine how well an individual plant was meeting this three-pronged approach, a case study was conducted in 2000 at the Novo Nordisk insulin plant in Clayton. As part of the study, 25 interviews were conducted with stakeholders. Half of the interviews were with external partners such as authorities and community support organisations. Half of the interviews were with external partners such as authorities and community support organisations. Furthermore, an economic impact report from the University of North Carolina was commissioned in order to more fully assess the relationship between the plant and the local community.

Novo Nordisk in Clayton is involved in several community projects, either by participating in events or on boards or by direct sponsorships. In July 2000, a social responsibility committee was established to identify, coordinate and promote employee and company activities supporting local community projects. For example, in December 2000 the plant donated USD 16,000 to the United Way, a fund-raising institution that provides support for charitable organisations. Employees raised half the amount, which was matched by the company. "The company is letting the employees do community work during working hours. To me, that's the most important value of the company," comments Chuck Olmstead, warehouse operator.

A growing community
Novo Nordisk Pharmaceutical Industries, Inc. is located in a rural area in Johnston County, and employs 203 people. The site anticipates further growth in 2001. The community has grown dramatically – within a 10-mile radius the population has increased by nearly 36% during the last 10 years.

The Clayton plant is a wholly owned subsidiary of Novo Nordisk and functions as a cost centre rather than a profit centre. This means that the site is measured internally against a cost budget. The profit generated at the plant through sale of products to the Novo Nordisk sales organisation in the US, is taxed locally.

Pressure on production
Being a good neighbour is an important value for the company. It is also necessary in order to retain good employees and attract new people. With steadily increasing production volumes and a fierce job market, retention of qualified employees is a significant issue.
The Novo Nordisk plant has numerous economic impacts on the local community just as the community has considerable impact on the plant. These impacts include taxes paid by the company as well as by employees, services received from the community, and the stimulus to local trade and industry. Furthermore, employee salaries and wages spent locally multiply through the economy of the county as employees become consumers. More than half of the workforce lives in Johnston County.
In 1999, the employee turnover rate hit 31%. The very low unemployment rate in the county (less than 2%) was a contributing factor, but rapid growth in production and hiring a lot of new personnel also put pressure on employees in terms of increased instability at the workplace. The employee turnover rate fell by one-third to 21% in 2000. The company instituted a new compensation plan and organised more social activities. Supervisors were trained to become better managers. More employees were hired in 2000 to alleviate work pressure. Yet production is still increasing.

"Achieving higher production targets is a 'pat on the shoulder' for us, but we know that our employees are working very hard to achieve these targets. We now need to focus more on the balance between work and private life," says John Pratt, general manager. The plant expects to recruit 45 new employees in 2001.

The dilemma of a flat organisation
Unlike many other companies in the area, Novo Nordisk in Clayton has a flat organisation. There is an informal atmosphere, and anyone can walk into the office of a manager, even the general manager, to discuss matters. Production employees work in self-directed teams. Employees like the flat organisation because it ensures greater self-determination and rapid decision-making.

However, limited career opportunities are a typical dilemma for a flat organisation. “It’s frustrating for many professionals that they don’t have new opportunities in the company after two or three years,” says Rick Isaza, director of manufacturing. To resolve this dilemma, management is offering more job responsibility and bonuses for superior performance.

Environmental management at all levels
At Clayton, environmental performance is measured in terms of use of resources and of emissions and their related impact on the surrounding community. To integrate environmental management into the plant’s daily operations, environmental targets are included in the annual targets for managers, and employees where relevant. In cases where environmental targets are included in the employees’ personal goals, bonus programmes are linked to achieving the targets. The major environmental focus area in 2001-2002 at the Clayton site will be the implementation and certification of the ISO 14001 management system.

Since 1998, the plant has implemented several water- and energy-saving projects, resulting in a considerable increase in resource efficiency of 218% and 133% respectively. Integrating environmental aspects into daily management has also resulted in a high degree of legal compliance. Based on measurements conducted, a compliance degree of 99.6% has been achieved. This corresponds to five breaches, none of which are regarded as significant by the local authority, the Town of Clayton.

Impact on the environment
The plant’s environmental impact on the community is relatively small. Water consumption constitutes approximately 0.6% of the total water consumption in Johnston County. The site’s permitted discharge of wastewater constitutes 5% of the municipal treatment plant’s capacity, although the actual load is only 3.7%.

Officials from the office of the Johnston County Manager and the Clayton Town Manager stress the high ethical standards of the company, and state that the Novo Nordisk plant is proactive in handling environmental issues and problems.

Being a good corporate citizen and playing an active role in the local community are important aspects of Novo Nordisk’s set of values and essential to earning our licence to operate. In the future, the plant in Clayton expects to engage even more deeply in community issues.

In the words of Martin Luther King Jr.: “It really boils down to this: that all life is interrelated. We are all caught in an inescapable network of mutuality, tied to a single garment of destiny. Whatever affects one directly affects all indirectly.”
As part of the Triple Bottom Line study, a human rights study was conducted at the Clayton plant. In the USA in general, three issues in particular are highlighted by international human rights organisations: staff representation, equal opportunities, and the right to privacy. The results are presented below:

**Staff representation**

At the Clayton plant employees have not expressed any interest inorganising, on the contrary, it was seen as an unnecessary expenditure. Easy access to management, very good terms of employment and open communication were the reasons given for not wanting union representation.

**Equal opportunities**

People barred from employment opportunities on racial and ethnic grounds remain a significant issue in the US. Equal remuneration for men and women is also a concern in the US, as in many other countries.

The Clayton plant complies with US federal and state legislation. Personnel statistics confirm diversity and equal remuneration in the Clayton workforce. At present, no women are represented in the senior management team (which includes six positions), although a woman has previously been a member of the team. To improve opportunities, diversity training and affirmative action, training will be conducted annually for supervisors and managers, starting in 2001.

**The right to privacy**

Infringement of the right to privacy of employees is an issue of rising concern globally, due partly to the information technology revolution. This poses a real dilemma, as the company wants to respect the privacy of the individual, but is obliged to manage company concerns. At the Clayton plant, employees’ use of the Internet and of e-mail systems is controlled. The company performs surveillance because, according to US legislation, it could be held liable for illegal or harassing activities and content accessed or engaged in by its employees. The surveillance measures are communicated clearly to employees by postings.

Another privacy issue is drug testing, a normal feature of many American companies. The goal of such testing is to enhance safety at the workplace. However, under certain circumstances testing can be used to reveal personal information that is not relevant to the employer/employee relationship. The Clayton plant employs external consultants to perform drug testing. The medical files are kept confidential and can only be accessed by the doctor and the health administrator connected to the plant. Information may only be provided to the human resources staff on a need-to-know basis for the purpose of evaluating legal employment decisions.
Long-term financial profits of the Novo Group are tangible. Since 1995 turnover has nearly doubled from 13.7 million DKK to a total of 25.8 million DKK for Novozymes and Novo Nordisk in 2000. From 1999 to 2000 Novozymes’ net profit increased by 18%, while in the same period Novo Nordisk saw a growth in net profit of 54%.

Delivering shareholder value was a key requirement of the successful execution of the decisive reorganisation in 2000. The financial statements up to and after the event demonstrate that promises made to shareholders have been fulfilled. One key indicator demonstrating this is the market capitalisation of the companies’ B shares. By the end of 2000, market capitalisation had increased by 57% from 59.0 billion DKK in 1999 to 92.5 billion DKK.

Among the global leaders
Novozymes and Novo Nordisk are included in the Dow Jones Sustainability Group Index (DJSGI) together with more than 200 other world-leading companies from 64 industries in 33 countries. The index has been designed to provide investors and industry with a neutral, rigorous and transparent measurement of Triple Bottom Line performance. Measuring financial performance over the period 1995-2000, companies in this index comfortably outperform the Dow Jones average return on investment.

Incubator for innovation in life science
As the major stockholder of Novo Nordisk and Novozymes, Novo A/S brings some of its profits back into the market as venture capital investments. These investments help commercialise pioneering business ideas in the life science arena. With a long-term commitment to sustainable ideas, Novo A/S is an incubator for new enterprises and can provide more than financial capital. Partnerships include access to our scientific network, management support and the Novo Group corporate governance model.

As a rule, Novo A/S remains a minority shareholder and often partners with other venture investors in international teams to provide a broad financial platform for growth. In 2000, eight newly established companies were added to the portfolio. Included are also holdings in ZymoGenetics, USA, today a Novo Nordisk associated company. Investments in 2000 totalled DKK 200 million and are expected to increase significantly in coming years through expansion in the Danish-Swedish Øresund region as well as throughout the world, mainly in North America and the rest of Europe. This will mainly occur via direct investments in portfolio companies and to a lesser degree through international venture funds.

While striving to balance the Triple Bottom Line, the companies in the Novo Group have also demonstrated their ability to be profitable in financial terms. The holding company, Novo A/S, reinvests some of its profits by offering capital to new life science companies.
In 2000, the consolidated environmental costs for the Novo Group increased by 7% to 251.2 million DKK. In the same period, Novozymes increased its turnover by 12%, while Novo Nordisk's turnover grew by 27%. Several factors explain this positive development. With a mere 8% increase, biomass management costs are now less than in previous years. This is the result of more effective production with less waste. Net costs for wastewater treatment have decreased. The total volume decreased by 2%, and average charges for treatment have declined marginally.

Novozymes and Novo Nordisk have both managed to raise production volumes and still reduce the energy and water consumption. As in 1999, we have used our EPs to measure the impact of changes in efficiency and prices on energy and water costs in our production. Our analysis shows that the efficiency gain in consumption does not result in similar actual savings in our costs, as energy and water prices have increased significantly during 2000. For water, our efficiency gain would have resulted in actual savings of 2.9 million DKK, and for energy, actual savings of 39.8 million DKK, if prices had been the same in 2000 as they were in 1999. Our actual savings in 2000 prices were 3.2 million DKK for energy. For water, we had an increase in costs of 5.3 million DKK.

Environmental investments

In 2000, environmental investments amounted to 64.9 million DKK, of which Novozymes' share is 34.8 million DKK, while Novo Nordisk invested 30.1 million DKK. Compared to 1999, total investments have increased by 51%.

Most investments were made at the purification plants at the Kalundborg site, where production facilities have been expanded. For Novo Nordisk alone, such investments amounted to 26.2 million DKK, or 87% of its total environmental investments.

For Novozymes, too, the largest single investment was the optimisation of the wastewater treatment plant at Kalundborg. This accounted for 12 million DKK in 2000. The expansion was prompted by various legal restrictions, which have forced the company to convert more of the biomass to solid form before spreading it on farmland. Novozymes has also invested some 7 million DKK in enhancing safety, of which 6 million DKK was spent building a new pilot plant in Denmark for research, development and production.

Statement of environmental costs and investments for the Novo Group

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<tbody>
<tr>
<td></td>
<td>NZ</td>
<td>NZ</td>
<td>NN</td>
<td>NN</td>
</tr>
<tr>
<td>Running of environmental departments</td>
<td>20.9</td>
<td>25.9</td>
<td>13.6</td>
<td>12.3</td>
</tr>
<tr>
<td>Net cost of wastewater treatment at municipal plants</td>
<td>38.1</td>
<td>36.5</td>
<td>26.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Biomass management (including transportation, treatment and capacity costs of running the department)</td>
<td>104.5</td>
<td>112.4</td>
<td>92.6</td>
<td>19.8</td>
</tr>
<tr>
<td>Handling and disposal of solid waste</td>
<td>28.8</td>
<td>32.6</td>
<td>9.5</td>
<td>23.1</td>
</tr>
<tr>
<td>Energy SO2 and CO2 taxes (non-refundable)</td>
<td>42.9</td>
<td>43.4</td>
<td>15.9</td>
<td>27.3</td>
</tr>
<tr>
<td>Remediation cost for polluted sites</td>
<td>0.6</td>
<td>0.4</td>
<td>0.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Total environmental costs</td>
<td>235.8</td>
<td>251.2</td>
<td>138.0</td>
<td>93.2</td>
</tr>
<tr>
<td>Environmental cost/total production costs</td>
<td>3.6%</td>
<td>-</td>
<td>6.5%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Environmental cost/turnover</td>
<td>1.1%</td>
<td>-</td>
<td>3.1%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Environmental cost/operating income</td>
<td>5.6%</td>
<td>-</td>
<td>19.2%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Environmental investments</td>
<td>43.0</td>
<td>64.9</td>
<td>34.8</td>
<td>30.1</td>
</tr>
<tr>
<td>Environmental investments/total investments in tangible assets</td>
<td>2.2%</td>
<td>-</td>
<td>8.7%</td>
<td>1.3%</td>
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</table>

*) 1999 figures adjusted due to improved compilation of data
**Amounts for this table were:
* collected from financial systems: Danish env. department costs, biomass management costs, sales for recycling, investments
* calculated based on estimated wastewater flow, wastewater costs
* calculated based on questionnaire: solid waste costs, remediation costs, all outside Denmark costs
* calculated based on refundable energy charges, energy charges
NZ = Novozymes
NN = Novo Nordisk
We shall conduct our business in a socially and environmentally responsible way and contribute to the enrichment of the communities in which we operate.

The Novo Group Charter
Behaving in a socially responsible manner is an integral part of our commitment to sustainable development. By this, we mean that we will continuously improve our social performance by setting high objectives and integrating social considerations into our daily business. We maintain an open dialogue with all our stakeholders and report annually on our social performance.

During 2000 we continued to develop our understanding of social responsibility and to develop a broader strategy for the area. In this section of the report we focus on some of our activities in relation to our own employees, the progress we are making in our social responsibility strategy and how we are addressing the issue of global access to health care. Our progress in the area of health and safety can be found in the Internet version of this report.

We are committed to making the Novo Group a challenging and rewarding place to work. We believe this is an essential part of attracting and retaining the kind of talented, dedicated employees who make the company what it is today and who will direct its future course. This includes offering many opportunities for professional and educational development. In this section, you can read about how Novozymes has developed a set of global indices to document how well the company succeeds in terms of attraction and retention of employees. We know that more flexible decision-making processes, greater empowerment of employees, and diminished bureaucracy are key elements in making our company a rewarding place to work.

We have also directed our attention towards the important issue of balancing work and private life, and initiated steps for reducing work pressure. By remaining attuned to the concerns of our employees, and taking appropriate action when necessary, we maintain our competitive edge and give people the chance to grow and develop.

A case study at the Novozymes plant in Brazil examines equal opportunity. We also report on the completion of our review of human rights.

Among the most important challenges Novo Nordisk faces in the area of social responsibility is worldwide access to adequate, affordable medical care. Helping to achieve more equitable health care is one of the most vital ways in which we can demonstrate our willingness to be a responsible global corporate citizen. Novo Nordisk’s initiatives in this area are discussed in this section.
The total workforce of the European Union and the United States is shrinking, primarily due to lower birth rates and an ageing population. Novo Nordisk is growing, however. The Danish organisation expanded by 16% or 1,200 new positions in 2000. The US sales and marketing organisation grew by 200%. Expansion of the workforce is becoming much more challenging.

Cultivating science
Novo Nordisk actively supports and participates in education, research and innovation activities within the fields of biotechnology and biomedicine, e.g. by funding scholarships, doctorates and post-doctorate degrees. Such measures improve the recruitment platform for Novo Nordisk, while society also benefits in terms of high-quality education programmes. An OECD report, “Science, Technology and Industry Outlook 2000”, states, for example, that increased cooperation between public research and industry in Denmark has resulted in substantially more registered Danish patents.

Attracting the best
“Attract and retain the best”, an important part of the Novo Nordisk people strategy, had “attraction” as its main focus in 2000. To support this goal, the company launched attraction programmes and a new job website, together with different ways of introducing people to the organisation.

The greatest expansion was in production, which accounted for 60% of all new positions. However, there is concern about the declining number of young professionals. Novo Nordisk has responded by establishing a department with an exclusive focus on staffing. Its activities have included increased representation at job fairs and creating a top student-focused programme as well as international trainees programmes. Employee development has also been emphasised.

Market success is attractive
The Universum Graduate Survey 2000 of 1,031 Danish business and engineering students shows that the top three factors attracting these students to a company are inspiring colleagues (39.3%), increasingly challenging tasks (33.9%), and flexible working hours (29.7%). In the same survey, the Novo Group was ranked number two in Denmark in terms of overall attractiveness as an employer (LEGO ranked number one).

Among the students who saw the Novo Group as their ideal employer, “market success” was the characteristic most associated with our company (75%). Other important characteristics were “exciting products” (57%), “financial strength” (51%) and “strong corporate culture” (46%). “High ethical standards” was marked by 30% as a characteristic that they associated with the Novo Group, compared to 20% on average for the pharmaceutical industry.

Expanding in the United States
While a high profile employer in Denmark, Novo Nordisk is not well known by the general public in the United States. The sales and marketing organisation therefore faced a significant challenge when it was decided in 2000 to hire 400 new sales representatives and 40 regional managers. Previously, Novo Nordisk worked in a partnership arrangement with another sales force, but a new strategy called for building our own sales force in order to increase market shares effectively.
in the United States. There is strong competition for talent in the pharmaceutical industry, and the USA has the lowest unemployment rate in 30 years. "Name recognition" is a card that we cannot play in America, so how does Novo Nordisk attract people in the United States?

**Working on more tasks**

A qualitative survey of newly recruited sales and marketing employees at Novo Nordisk in the USA shows two main attraction parameters: the remuneration package and the opportunity to "work with more hats", or more varied job tasks, in a small business. As one put it: "Small company environment, big company muscle." Stock options are only offered to senior level managers, which calls for a stronger benefit package. A 1999 benchmarking survey on compensation showed that Novo Nordisk in the USA offered one of the best benefit packages to sales representatives among the 15 largest pharmaceutical companies in the US.

"Working with more hats" is a great opportunity for people to expand their skills. As one employee said, "I have a chance to do things here that would take me five to six years in bigger companies". It also puts special demands on training, which are being met with development plans for all employees. Another important aspect of attracting employees is empowerment - the belief that people will make the right decisions if they have the responsibility and the necessary knowledge. This is not just a necessity for a small company in a large market – it is also a parameter of attraction.

**CHANGING BUSINESS SITUATION**

In 1999, Novo Nordisk laid off 183 employees in Denmark. A substantial increase in hiring just one year later may seem perplexing for the people who were laid off as well as for their colleagues. At the time, a large number of new product introductions forced management to reallocate resources from Denmark to the international sales and marketing functions. We also had to discontinue a major development project, and we were facing a DKK 700 million loss in royalties from a significant product. Moreover, the share price dropped dramatically in 1998, indicating a decline in confidence in Novo Nordisk's ability to succeed.

During the following 18 months the business situation changed significantly: new products have been introduced successfully, creating a lot of work in the organisation, especially in production. The success of the haemophilia product NovoSeven® has put more pressure on the organisation than we had imagined. We could hope and work for these successes, but it would have been irresponsible to take them for granted. Twenty percent of the people who were laid off have now been rehired by Novo Nordisk, mainly in permanent positions.

In the 1999 Environmental and Social Report it was discussed how the layoffs affected administrative personnel more than other groups. A target was set to review the competency development of administrative personnel and explore improvement alternatives.

In 2000 a survey showed that some of the administrative personnel did lack training, and a training programme has consequently been established for these employees.
Novozymes

**LINKING STRATEGIES WITH PERFORMANCE**

With the demerger of Novozymes and Novo Nordisk, Novozymes is a new, leaner company with the opportunity to introduce more flexible decision-making, further empower its employees and reduce bureaucracy. The values and practices of a company are vital when competition for attracting talented people is fierce.

The Novo Group’s social values and commitments are all about a basic respect for the individual and a commitment to help people achieve their full potential. Practices reflecting these values, such as empowerment and opportunities for development, will naturally be maintained, together with favourable employment conditions.

At Novozymes, “the war for talent” is a strategic objective. Novozymes had expected an increase in staff turnover with the demerger. The actual turnover of 8.3% (Denmark) was lower than expected.

Nevertheless, with the increase in the number of biotechnology companies, people have the opportunity to pursue new careers. Experience also shows that a higher turnover rate is a natural trend at a time of restructuring. Some people will always leave the small company in favour of the large, and others will naturally make life changes in times of flux. After a time, business and staff turnover rates tend to return to normal.

**Linking strategies with performance**

“Attraction and retention” of employees is included in the management system (Balanced Scorecard) using an index of indicators. Winning the war for talent will be addressed at each functional level and at the annual Organisational Review and Audit, in which every unit must prepare an assessment of the attraction and retention situation and present what has been done and what will be done. Attraction and retention are not only about remuneration, but also about leadership, teamwork and flexibility. These are issues on the 2001 agenda of all Novozymes’ business units.

For some years the Novo Group has been working with social performance indicators that respond to the information needs of management and which can be used to drive the business.

In its global set of indices on attraction and retention, Novozymes has included a number of indicators to provide a more accurate picture of complex issues (see page 33). An annual baseline still needs to be established as the index was developed during 2000. Another index covering social responsibility is being developed in 2001.

**Novozymes employee turnover rates, Denmark (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
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<tbody>
<tr>
<td>NZ turnover rate</td>
<td>4.7</td>
<td>7.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Percentage of NZ employees who chose employment in other Novo Group companies</td>
<td>1.3</td>
<td>2.8</td>
<td>3.1</td>
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</table>
MANAGING STRESS AT WORK

In 1999, an employee survey showed that many employees have felt too much pressure from work, an issue of continuing concern in 2000.

In Novozymes, senior management identified that the employees reporting the highest rates of work pressure were employed in two specific areas. The stress experienced by these employees could be explained by extensive reorganisations. Stress management seminars will be conducted in 2001 for employees. Stress is also addressed in the employee survey to be conducted in 2001.

In spring 2000, Novo Nordisk conducted a number of follow-up meetings on the 1999 employee survey. At these meetings many employees indicated that increasing personnel was the most effective way to deal with the work pressures identified in the survey. Most units with a high workload score have increased their staff significantly during 2000. Furthermore, several activities were carried out to reduce workloads, including changes in working procedures and the introduction of stress management programmes.

To evaluate whether the activities were successful, Novo Nordisk decided to focus more on workload in the 2001 follow-up employee survey. The survey will be extended to more affiliates, with an increased number of workload-related questions. The data will be made available at departmental level to allow each manager to adopt more goal-oriented action plans.

RETAIN AND ATTRACT INDEX OF NOVOZYMES

In an attempt to measure the success of attraction and retention practices, Novozymes’ Human Resources (HR) department has defined an index describing the ability to attract potential candidates and to retain current employees. The index will measure several different indicators, all of which have an influence on retention and attraction. Examples are salary level compared to society in general, employee turnover, reasons for resignations, number of applicants and number of unfilled positions. The number of people who accept job offers, and how newly recruited employees are doing, are also measured in the index.

GAINGING ACCESS TO THE JOB MARKET

Corporations in Denmark have not had a long tradition for taking care of people who have been marginalised (e.g. people who may be highly qualified, but who have difficulties in entering the job market because they are disabled, long-term unemployed or from another country), as the government has been the prime caretaker. This situation is gradually changing in Denmark, and society is beginning to expect companies to assume a larger social responsibility for these groups.

Companies in the Novo Group have a long history of good practice in terms of taking care of our own employees who cannot work normally for a shorter or longer period of time. However, we have been less active in terms of helping marginalised people gain access to the job market through job training, for instance, although some initiatives have been carried out during the last few years. During 2000, in connection with the demerger, Novozymes reviewed all basic human resource strategies, policies and procedures. In 2001, the Social Responsibility Committee plans to further explore the issue of the inclusive labour market.
At its most basic level, social responsibility is about caring for people. This concerns not only our own employees and the local communities in which we operate, but also the impact of our business on the global society.

As an international business, the Novo Group must carefully manage its responsibility and values in a global context. The Universal Declaration of Human Rights helps us to define and direct our social responsibility initiatives. However, we realise that the integration into our policies and practices will take time. For this reason we initiated a human rights review in 1999 to identify priorities for our initiatives.

Novo Group human rights review

The review was finalised in 2000, and provided an overview of human rights in relation to our business activities and our governance structures worldwide. It helped identify existing initiatives around the world, and revealed no major violations of the human rights declaration.

Based on the conclusions from the review, our initial goals are to develop a strategy for securing equal opportunities and diversity in the workplace worldwide, and to define our approach to the issue of access to health care. Please refer to the article “The right to health” on pages 36-37.

Dialogue and training

During 2000, we initiated internal training on social responsibility, including human rights and held a roundtable discussion with a small group of human rights experts and business representatives. During 2001, we will continue employee training and stakeholder consultation to improve awareness of social responsibility and the understanding of the relevance of human rights to corporate behaviour.

As part of the Human Rights Review, two studies were undertaken in 1999: one at the Novo Nordisk health care affiliate in India and another at the Novo Group production site in Kalundborg, Denmark. Furthermore, two studies were completed in 2000: one at Novo Nordisk’s pharmaceutical plant in Clayton, North Carolina, USA, and one at Novozymes’ enzyme plant in Araucária, Brazil. These are described on pages 22-25 and 35 respectively.

Defining equal opportunity

Based on international conventions, the Novo Group defines equal opportunity as: “Equal opportunity in recruiting, terms of employment, promotion, and termination is practised without any distinction, exclusion or preference made on the basis of gender, sexual orientation, age, disability, marital status, religious beliefs, creed, colour, race or ethnic origin or political orientation, except when justified by requirements intrinsic to a specific job.”

The Novo Group sees human rights as an integral part of our social responsibility. We support the UN Universal Declaration of Human Rights, and the challenge is now to make the commitment fully operational. During 1999-2000 we completed a review of the Declaration against our actual practices and defined future focus areas.
As part of the study a number of interviews were conducted with both employees and external stakeholders. The study revealed the willingness of the employees and management to engage with equal opportunity, and gave a good understanding of local perceptions on the issue.

Novozymes in Brazil is a member of Instituto Ethos, the leading Brazilian institute for corporate social responsibility. The goal of the cooperation is to develop future strategies in the area of equal opportunity.

Although Brazil is a multiethnic society, the issue of equal opportunity has not been a focus in Brazil as it has been in the US and parts of Europe.

The Brazilian Constitution includes strong human rights protection also prohibiting discrimination in the labour market. However, organisations such as the International Labour Organisation, Amnesty International and Human Rights Watch have identified ethnic minorities in Brazil who are exposed to discrimination in practice.

Specific issues and dilemmas
The pilot study focused on women, ethnic minorities, disabled and people with allergies. Although certain ethnic minorities are sometimes subject to discrimination in Brazil, these groups are represented in the Novozymes workforce. Women are well represented in management and there is equal pay for men and women.

The plant does not currently employ women in the production area, mainly due to considerations about women’s health, safety and security.

Enzyme allergy can be damaging to a person’s quality of life and working ability. The law in Brazil requires medical testing of applicants before and during employment, which means that applicants found to be predisposed to allergy are not employed for production and laboratory work. During 2001 Novozymes will coordinate its allergy surveillance programmes worldwide.

An opportunity and a challenge
As yet there is no formal Novo Group policy on equal opportunity, but some of the individual affiliates in the Group do have such policies in place. The Novozymes plant in Araucária does not yet have a specific policy on this issue.

For the plant, equal opportunity is seen as both a great challenge and great opportunity. The challenge will be to fully identify the problems and the opportunity lies in the large diversity within Brazilian society.
Novo Nordisk produces insulin and other life-saving health care products, but this alone is not enough to fulfill our social responsibilities. We see a greater role that companies such as ours can play in ensuring affordable, accessible health care. In India, for example, we have engaged in capacity building to help ensure that health providers in the country can adequately deliver diabetes care.

Our stakeholders are demanding greater transparency and participation in the provision of global health care. Globalisation is underscoring the complex issues of poverty, inequity, discrimination, patents on medicine, and allocation of scarce resources in the provision of health care. Companies are expected to consider issues not yet covered by regulations or which are unlikely to be subject to public policy. All of these concerns raise serious questions, and we intend to work with all stakeholders in the health care debate to try to find some answers.

Today, about 150 million people around the world have diabetes. According to the World Health Organisation (WHO), that number will grow to 300 million by 2025, with 70% of the increase in developing countries. Furthermore, it is estimated that close to three-quarters of people with diabetes worldwide are not treated optimally in accordance with the guidelines for managing their disease. This can cause complications like blindness, kidney failure and limb amputations, unnecessary suffering and loss of life. Faced with this situation, Novo Nordisk believes it has a role to play in helping countries develop and implement national programmes for diabetes. We have done so for many years in several countries in cooperation with WHO and the International Diabetes Federation (IDF).

In 2000, Novo Nordisk formed a Health Policy Committee to drive this process further. The mission of the committee is to establish a global health policy, promote collaboration between Novo Nordisk and its partners in the health care system to improve the outcome of diabetes therapy, and provide guidance to all programmes promoting health of the employees in the company.

Driving partnerships
Partnerships are not a new direction for Novo Nordisk. For many years we have steered initiatives to further the care and treatment of diabetes. We have sponsored clinical research to improve therapy and contributed to important studies in the field of clinical care and prevention. We have been working with WHO to identify people with diabetes in the developing countries. For the past 10 years, our company has been actively promoting the St. Vincent Declaration on improving the outcome of diabetes treatment. This declaration was the result of a meeting between industry and diabetes stakeholders in St. Vincent, Italy, in 1988. This collaboration has led to similar regional initiatives for the improvement of diabetes care, such as DOTA (Declarations of the Americas) and WPD (Western Pacific Declaration).
In early 1999, the Oxford Centre for Diabetes, Endocrinology and Metabolism in the UK was established as a partnership between Oxford University, the British National Health Service, and Novo Nordisk. The vision of this partnership is to create an international centre of excellence for diabetes care, education, and research. Together with IDF we have promoted the importance of patient empowerment and leadership for several years.

Diabetes care
It is important to us to further understand the problems and obstacles faced in the daily lives of people with diabetes. Consequently, we initiated a global survey called DAWN (Diabetes Attitudes, Wishes and Needs) to uncover the behavioural, social and psychological aspects of diabetes in more than 10 countries. This is the largest global survey on diabetes ever conducted, and will create the foundation for a more fact-based dialogue among various diabetes stakeholders. The survey will continue in 2001 and conclude in 2002.

Also in 2001, we will undertake a fact-finding exercise in three developing world countries in order to develop a “sustainable health care model”, helping people with diabetes in poor countries gain access to diabetes care within a structure that is economically viable for our business. We will call on other organisations and industries to help implement better health care for the neediest countries.

We will also conduct a review of the national diabetes strategies in all the countries where we have an affiliate. Our intentions are to identify gaps in the implementation of the programmes in which Novo Nordisk can play a role or facilitate a better and more effective provision of health care for people with diabetes.

Recognising vision and leadership
In 2000 we presented the inaugural Novo Nordisk Health Policy Award to Dr. Michael Wooldridge, Minister of Health of Australia, for his vision, leadership and commitment to encouraging collaborative inter-sectorial approaches to diabetes care in the public health setting. This award will be considered every year.

Novo Nordisk is working on establishing employee health programmes which intend to improve the health of our employees on a basis of evidence. On the World Diabetes Day in 2000 we held jogathon events at all affiliates to raise money for diabetes care, in which over 19,000 people participated. We wanted to increase the knowledge among our employees about diabetes as well as the importance of a healthy lifestyle. Also in 2000, some 4,000 Novo Nordisk employees had personal contact and dialogue with persons with diabetes or attended a course in knowledge about the disease.

Health for people all over the world is a prerequisite for sustainable development. By sharing our knowledge and expertise, we hope to contribute to a common effort among many different stakeholders to improve health in society.
OPEN AND HONEST

Our business practices shall be open and honest to protect the integrity of the Novo Group companies and of each employee.

The Novo Group Charter
Environmental and bioethical performance is not only about finding simple technical solutions to problems. It is just as much about respecting life in all its myriad forms.

We consider bioethics one of our core issues in the environmental, medical and animal spheres. We define bioethics as all ethical issues related to the use of life science technologies for the development and production of biotechnological and pharmaceutical products. Animal welfare, patenting, access to genetic resources and benefit sharing, and the safe application of gene technology, are among the issues we work with. In our work, we try to apply the basic bioethical principles of not doing harm but rather doing good by demonstrating respect and justice.

Our use of genetic engineering, like other new technologies, pushes the boundaries of human activities. We aim to develop clear policies in response to controversial issues, and to be open, accountable and engaged with our stakeholders.

In this section, we report on how our values shape the performance of the Novo Group in relation to the environment, genetic engineering and animals. As an international company, we consider globalisation and the equal distribution of benefits and burdens among people as important aspects of our environmental agenda. It is a process of trying to create benefits for humankind without causing harm to the environment.

Since we are concerned about how our operations and activities fit into the bigger picture, we are also constantly trying to improve the accuracy of environmental impact accounting. In doing so, we have learnt that increasing production does not necessarily mean a more damaging footprint. By applying environmental performance indicators, we can determine, for example, that our use of water and energy is declining while our production levels rise or stay the same.

Our commitment to seeing our role as part of a complex and integrated natural system influences our work with genetic engineering. We use genetically modified microorganisms (GMMs) in closed tanks in our fermentation processes. Our production is based exclusively on well-characterised microorganisms which are classified as safe by the authorities. This is the reason that limited quantities of GMMs are allowed in wastewater and emitted air from our plants.

As a pharmaceutical company, animal experiments are a necessary part of Novo Nordisk’s research and development activities. We cannot for the foreseeable future replace all animal experiments. But we can continuously refine the care and use of animals and develop procedures that reduce and/or replace animal experiments.

We face many ethical challenges. Being a successful business in the long term - not just the short term - requires no less than full accountability.
Solving the world’s environmental problems is an enormous undertaking for the international community. We believe that global environmental issues such as climate change, change in biodiversity and waste generation are universal. Business has a role to play in proactively influencing the global environmental agenda with appropriate actions and policies.

The Novo Group’s strong focus on eco-efficiency is directly related to national and international political objectives – protection of scarce resources, as well as limitation of pollution. Our Eco-Productivity Index (EPI) expresses eco-efficiency as our ability to effectively utilise resources. The EPIs relate the scale of production to the consumption of resources. An increase in the index is a positive trend and means that we have been able to produce more with less.

Generally, EPIs for Novozymes and Novo Nordisk improved significantly in 2000 compared to 1999, basically due to the fine-tuning of environmental management systems (see “Developing tools to chart progress” on pages 44-45).

Use of water
The total water consumption of the Novo Group has increased by 1% compared to 1999. The Novo Group’s EPI for water has improved by 22%.

Throughout the Group, production sites have tried to reduce water consumption. Water-saving campaigns and projects resulted in reduced water consumption in general and reduced consumption of scarce groundwater resources in particular. A few outstanding examples are the Novozymes factory in Tianjin, China, with a 27% reduction in water consumption, and the Novo Nordisk factory in Clayton, USA, with an 11% reduction. At our largest production site in Kalundborg, Denmark, water consumption has increased by less than 1%, although production activities have increased markedly. The Kalundborg plant accounts for about half of the Novo Group’s total water consumption.

Use of energy
Total energy consumption is up by 6%, but the Novo Group’s EPI for energy has improved by 17%. The improvement indicates that we have been better at utilising energy – to produce more products with less energy.
Further details on data collection, use of resources, emissions to air, wastewater etc. are given in the Internet version of this report.

**Markets are targets for regulation**
In the Novo Group, we believe future key instruments for solving environmental problems will be market-oriented regulation such as product standards, green fees, taxes, and labelling of products. We believe it makes sense to apply the Polluter Pays Principle to prevent huge costs to society due to environmental damage, and to apply the Precautionary Principle to avoid unnecessary risks. We think that environmental pressures seen as environmental costs are likely to be increasingly priced and integrated into economy.
Compliance with environmental regulations is a fundamental requirement for the Novo Group’s licence to operate. However, there is more to compliance than just monitoring environmental performance against legal requirements. We also have a wider commitment, both locally and globally, through international charters and conventions.

A fundamental aspect of the Novo Way of Management is the responsibility of every manager to establish and maintain procedures in each unit for meeting relevant laws, regulations and overall Group policies. Our commitment to introduce environmental management systems throughout the Group is a good example of the tools we use to ensure continuous improvement of performance and compliance. In addition, every year we review and assess the progress on environmental performance in relation to the International Chamber of Commerce’s (ICC) Business Charter for Sustainable Development.

Breaches of regulatory limits
We regularly monitor our compliance with emission limits set in environmental approvals and permits granted by the authorities. With each breach of regulatory limits we endeavour to detect and address the cause of the problem in order to prevent repeated breaches.

In 2000, we did not achieve the target of avoiding repeated breaches of regulatory limits. A total of 31 breaches of regulatory limits were recorded at our factories worldwide, and 13 of these were breached on two or more occasions. This is a decrease of 76% compared to the 130 breaches registered in 1999.

Accidental releases
In 2000 we achieved our target to avoid accidental releases of genetically modified microorganisms (GMMs). Other accidental releases comprise spillage of liquid wastes, oil and chemicals to the external environment. In 2000, we registered a total of 18 accidental releases, compared to 26 in 1999.

Complaints from neighbours
We endeavour to maintain good relations with stakeholders and in particular the communities and neighbours around our factories. We therefore regard complaints as an important indicator in the evaluation of environmental performance. In 2000 the total number of complaints decreased by 56% compared to 1999. At the Novozymes plant in Copenhagen the number of complaints fell from 26 in 1999 to only 4 in 2000. This positive development has been achieved thanks to the commissioning of a new air purification plant, which has solved previous odour problems.

Previous years’ reports from sites have been part of the printed corporate report, but this year a number of sites have published their own printed site reports. Printed site reports supplement the Internet version of this report. They are written in the local language, and provide relevant information to the local community.
Novozymes' and Novo Nordisk's progress on environmental performance in relation to ICC's Business Charter for Sustainable Development

The 2000 rating has been performed by Novozymes and Novo Nordisk and verified by Simon Zadek.

Compliance, ICC | NZ | NN | Focus areas
--- | --- | --- | ---
1. Corporate priority | 6 | 6 | In 2001 focus areas for Novozymes will be:
2. Integrated management | 6 | 5 | ■ development of a common position on training worldwide (point no. 4),
3. Process of improvement | 5 | 5 | ■ implementation of plans for life-cycle assessment of selected products (point no. 6),
4. Employee education | 4 | 5 | ■ improvement of waste management (point no. 8),
5. Prior assessment | 3 | 5 | ■ harmonisation of partnerships with contractors and suppliers worldwide (point no. 11).
6. Products and services | 5 | 5 | In 2001 Novo Nordisk will especially focus on development of the environmental management system for all production sites.
7. Customer advice | 4 | 5 | 16. Compliance
8. Facilities and operations | 4 | 5 | 1. Evaluating practice
9. Research | 4 | 4 | 2. Developing plans
10. Precautionary approach | 4 | 4 | 3. Implementing plans
11. Contractors and suppliers | 4 | 4 | 4. Practice in place
12. Emergency preparedness | 4 | 4 | 5. Regular evaluation for improvement opportunities
13. Transfer of technology | 4 | 4 | NZ = Novozymes
14. Contributing to common effort | 4 | 4 | NN = Novo Nordisk
15. Openness to concerns | 4 | 4 |
In the Novo Group we use tools such as environmental management systems, environmental monitoring, life-cycle assessment, and systematic collection of data from production facilities to document environmental performance. The basic tool for general data collection and review is described in the Internet version of this report. Without these tools and procedures, it would be difficult – if not impossible – to move our environmental strategies from idea to action.

Environmental management systems

Environmental management systems are major tools for the Novo Group’s plants and production sites worldwide. These systems provide a documented method of handling the environmental aspects of all significant activities.

In 1998 we took a major step forward in 2000 when Novo Nordisk decided to develop and implement an ISO 14001 environmental management system for all production sites.

Life-cycle assessment of InnoLet®

InnoLet® is the latest Novo Nordisk insulin doser for self-administration of insulin. In 2000 the company made a life-cycle assessment (LCA) of the environmental impact from making, using and disposing of the doser. The objective was to provide the necessary information to establish an environmental product declaration.

The preliminary conclusions of the LCA are that the main environmental impact is from the high consumption of crude oil for production of plastic and the high energy consumption for production and processing of plastic. Production and processing of the plastic parts account for up to 90% of the impact.

Employees drive the agenda

It is essential to involve and engage employees in efforts to make improvements in environmental performance. This is an important aspect of the environmental management systems of our businesses. Environmental training of employees has high priority in a number of our plants, which is described in detail in the individual site reports in the Internet version of this report.

In May 2000 the Novo Group’s environmental network, with representatives from production sites worldwide, met in China. Environmental network meetings are arranged every year to provide the opportunity to share experiences and further develop common tools.

DEVELOPING TOOLS TO CHART PROGRESS

We continuously develop internal tools and procedures in order to maintain an overview of the impact of our activities on the environment. These tools help us form strategies, guide activities, measure performance and promote the integration of environmental considerations into decision-making.
Avoiding dangerous raw materials

Novozymes has developed a tool for the environmental assessment of raw materials. Raw materials used in Novozymes' processes include sugar, starch, minerals, chemicals, etc. The aim is to strengthen the integration of environmental aspects into decision-making when new products and production processes are developed.

Environmental assessment is made in relation to four aspects as shown in the table. Each raw material is graded "high", "medium", or "low" in relation to the four aspects. Novozymes uses 401 different raw materials and the 240 economically most significant have been assessed. For the most part, the raw materials are not problematic and are graded "low".

The focus is on the raw materials graded "medium" or "high". These should be substituted, if possible, or appropriate handling should be ensured. Secondly, the focus is on materials that could not be fully categorized due to lack of scientific knowledge about the materials’ relationships to the four aspects. For the latter group of raw materials, data should be collected to make full assessments possible. The results of the assessment are shown in the table. Numbers are percentages of the 240 raw materials that have been assessed.

Raw materials are continuously assessed as new materials are introduced and new scientific knowledge is gained. The results of the assessments are made available to all Novozymes employees on the Intranet.

The Novozymes environmental management process for continuous environmental improvements

Teaming up with transport suppliers

A primary target for Novozymes and Novo Nordisk is to improve methods for measuring and reporting on transport, in order to reduce environmental impact. The transport of raw materials, products, wastes, etc. is carried out by our suppliers.

In a project together with our key transportation partners, two case studies were conducted focusing on transport between Denmark and Turkey, and between Denmark and England. Transportation and emissions were calculated for transport by truck or by ship.

Our goal was to develop a checklist and procedure for analysing environmental impacts from transportation, which we can use throughout the Group. This tool is an important step towards appropriately balancing the quality of transportation with the quality we offer to customers, the price we pay suppliers, and the environmental benefits and costs.

The results of the project were published in spring 2000 and can be viewed at www.etu.dk.
The Novo Group favours transparency of activities and tight public control on the use of genetic engineering. National and international laws regulate Novozymes’ and Novo Nordisk’s use of genetically modified microorganisms (GMMs) for production purposes. The GMMs and the way we use them fulfill the generally adopted international criteria for microorganisms to be classified as safe, which means demonstrating the lowest potential risk.

During 2000, most of our approvals in Denmark for production with GMMs were renewed following an amendment of the EC Directive on the contained use of genetically modified microorganisms. No changes were necessary in our handling of waste discharges and emissions based on the new risk assessments.

Approvals
The aim of legislation and government approvals is to protect human health and the environment from any adverse effects. Approvals are based on scientific risk analyses. When introducing a new GMM into the production, a thorough evaluation of the possible risks associated with contained use of the microorganism is required before the authorities issue an approval. This evaluation is done by the Novo Group, governmental bodies and independent research organizations.

For risk analyses we must provide the authorities with detailed information about the following: the process of genetic engineering, the GMMs, the production facility and the production process, and the safety procedures applied.

Monitoring release of GMMs
The Novo Group only uses GMMs in closed production facilities – a production method called “contained use”. Because our GMMs are safe and well known – presenting no risk to human health or to the environment – the release of a limited amount of GMMs from air emissions, solid and liquid waste is allowed. The limits are set by the authorities and regularly controlled.

We monitor if emitted GMMs have survived outside the production facilities. In 1999 a new and improved monitoring programme was initiated in Kalundborg, Denmark, in conjunction with the Danish regulatory authorities. The results were reported in summer 2000 and no GMMs were detected in any of the soil samples from around the production plant. The analysis will be repeated at three-year intervals as part of our control programme.

What is contained use?
“Contained use” is a highly specific term from national and international regulation. It means that physical barriers (such as our fermentation tanks), or a combination of physical, chemical or biological barriers, are used to limit the contact of genetically modified microorganisms (GMMs) with the surrounding environment. The regulatory authorities set limits for emissions of GMMs. A chemical barrier might be chemical treatment to kill organisms. A biological barrier is an inherent characteristic of an organism, which means that the organism’s ability to survive in nature is limited.

Safety of GMMs
Genetically modified microorganisms (GMMs) are classified as safe or demonstrating the lowest potential risk only if certain criteria are fulfilled according to the scientific risk analysis. It is a prerequisite that the GMM is not expected to be pathogenic to humans, animals or plants or in any way harmful to the environment. Furthermore, the original microorganism should be non-pathogenic, and the genes inserted should not be expected to cause any harm.
Novozymes: Case study from the production plant in Franklinton, North Carolina, USA

SHARING BETTER PRACTICES

In 2000, Novozymes earned certification of its enzyme production plants in Denmark, USA, Brazil, China and Switzerland according to the ISO 14001 Environmental Management System. At Novozymes North America in Franklinton, USA, implementing ISO 14001 also meant sharing better practices with external stakeholders and raising employee awareness.

Novozymes North America (NZNA) was ISO 14001 certified in May 2000. In October the production plant passed the first audit without any deviations from the standard set by the International Standardisation Organisation (ISO). At NZNA, the environmental management system has been implemented using a procedure in which all employees are involved in identifying environmental aspects and impacts.

In their choice of tools and procedures, the site management decided to develop a rating system. The purpose was to provide the organisation with an operational tool enabling employees and management to identify and rank all significant environmental aspects and impacts in a standardised way. This resulted in an extensive list of more than 800 aspects, which were subsequently consolidated and grouped according to impact. These were then ranked using environmental criteria in order to determine aspects with the highest potential for environmental impact. Finally, the significant aspects were re-ranked using business criteria such as costs. This process highlighted 14 aspects for which improvement objectives and targets have been defined.

Increased employee awareness
Focusing on environmental issues is not new to NZNA. The enzyme plant is acknowledged locally for its reuse of wastewater and biomass in agriculture and has been working actively for several years to integrate environmental issues in its management systems. ISO 14001 constitutes a formalised and systematic approach to monitoring and improving environmental performance. Some targeted improvements have already been achieved, such as increasing production by 9% per consumed unit of energy. However, increased environmental awareness of employees at all levels is stated to be the most significant benefit resulting from the implementation of an environmental management system.

Sharing better environmental practice
NZNA is committed to sharing better environmental practices. For many years the enzyme plant has developed and maintained a strong relationship with local and state authorities, educational institutions and the agricultural community. Along with six other companies, Novozymes has participated in a government pilot programme on ISO 14001 under the North Carolina Department of Environment and Natural Resources. This project was part of a national programme initiated by the US Environmental Protection Agency to evaluate effectiveness, compliance and employee involvement in environmental management. This cooperation has further strengthened Novozymes’ good relationship with state environmental authorities in North Carolina.

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NOVOZYMES NORTH AMERICA INC.

The Franklinton enzyme plant is located in North Carolina and serves as the North American regional headquarters for Novozymes. The plant produces a wide range of industrial enzymes, primarily for the North American market.
The potential of genetic engineering to affect the environment and human health raises ethical questions. We must be receptive to the concerns of society, be prepared to discuss the implications these technologies have on society, and in the end align our efforts in response to the values of our stakeholders.

For the past 10 years, stakeholder engagement has been invaluable in helping us understand how biotechnology is perceived by society. The Eurobarometer Public Perception Survey published by the European Commission also provides useful insights.

A precautionary approach

The Novo Group is continuously developing policies and practices that guide us in utilising and managing biotechnology, taking safety and ethical aspects into account. The use of genetically modified microorganisms (GMMs) is approved by the authorities. Our use of GMMs has been classified as safe or demonstrating the lowest potential risk.

In the research and development process, as well as in subsequent stages of product development, environmental and bioethical considerations are built into decision making. An important element of regulation is that scientific knowledge is acquired step by step, so that uncertainty is reduced prior to production. This is also reflected in the practice of the Novo Group.

Eliminating potential risks

In genetic engineering specific uses of genes coding for resistance to antibiotics (such as penicillin) are considered to be associated with potential risk. Genes that make microorganisms resistant to some antibiotics (called “marker genes”) are normally used in genetic engineering to make selection of successfully modified microorganisms possible. Yet because antibiotics are used for medical treatment of infections, it is important not to increase the level of antibiotic resistance in the external environment. In constructing our production microorganisms, every effort is made to avoid that resistance to antibiotics is transferred to other microorganisms.

At Novozymes the effort to develop alternatives to the conventional method has been a top priority in research and development. Significant progress has been made towards avoiding the use of resistance to antibiotics in new GMMs. In 1999-2000 a number of modified bacteria and fungi devoid of resistance to antibiotics were developed. Some have already been introduced into the production processes.

At Novo Nordisk this research and development effort to avoid resistance to antibiotics in GMMs was years ago initiated at Novo Nordisk. Here the genes coding for resistance was successfully removed from modified yeast, which is the microorganism used for the production of insulin. These new microorganisms will be introduced into large-scale production as soon as approval from the authorities has been received.

These efforts will continue in the future, but as long as genes coding for antibiotics are used in genetic engineering, it is important to gain knowledge of the potential risks in order to reduce uncertainty.
Reducing uncertainty
To utilise and recycle the biomass from Novozymes’ fermentation processes, the spent biomass is converted into the fertiliser NovoGro® used on farmland. To ensure that there are no adverse effects from its use, the microorganisms are killed and their genes are degraded.

Although all genes are undergoing a natural degradation process, in theory minute amounts of antibiotic resistance genes can be present in NovoGro®. Resistance could potentially be transferred to microorganisms in the soil and as a result, the level of antibiotic resistance in the environment might increase. Despite optimal laboratory conditions, we have not been able to transfer resistance genes from DNA isolated from NovoGro® to other microorganisms.

One of Novozymes’ targets for 2000 was to expand the field monitoring of microbial flora in the fields treated with NovoGro®. The aim was to see if the level of resistance to antibiotics had increased. Soil treated with NovoGro® during five to seven years was not found to differ from soil treated with inorganic fertilisers in terms of the number of microorganisms resistant to antibiotics. These results support our earlier findings.

In Novo Nordisk a valuable by-product from insulin production is “yeast cream”, which is recycled as a protein-rich feed supplement for pigs. A modification of the yeast cream process to ensure optimal degradation of the antibiotic resistance genes in full-scale production will be in place in 2001.

Modern biotechnology and food
The application of gene technology in food products has aroused much debate. A growing number of Novozymes’ enzymes for food manufacturing are produced using GMMs. As part of the production process the final enzyme product is recovered and purified, and therefore does not contain any GMMs.

We always inform both our customers and other interested parties about the techniques and processes used to make our products. We acknowledge the wish of the public to know about the food they eat and to exercise their right to base buying decisions on ethical grounds.

Public risk perception
As shown in the European Commission’s 2000 Eurobarometer survey on public attitudes to biotechnology, trust in the biotechnology industry overall continues to decline. This increasing mistrust also affects the public’s perception of risk. In the Novo Group, we try to address society’s concerns about real and perceived risks through open communication and dialogue and integrating these concerns into our daily decision-making.

The Precautionary Principle
The Novo Group applies a precautionary approach to the use of genetic engineering. The Precautionary Principle is integrated into environmental regulation and the approval system for the application of genetic engineering.

The 1992 UN Rio Declaration highlighted the importance of the Precautionary Principle in the context of sustainable development. It is now at the top of the international political agenda. The essence of the principle now is as follows:

If the purely scientific risk analysis is not adequate as the basis for decision-making, because uncertainty or potential risk is high, then risk management must ensure involvement of all relevant stakeholders to establish a broader basis for decision-making.
When developing pharmaceuticals and biological products, animal experiments play an important role in assuring the safety and efficacy of the products. Both Novozymes and Novo Nordisk follow the principles of the Three Rs: reduce the number of animals used, refine the methods we use, and find more methods to replace animal experiments.

Animal experiments in pharmaceutical industries serve many purposes, including ensuring that the pharmaceuticals developed are effective and without unwanted side effects. Animal experiments are one step on a product’s path from initial research to the end user. Another step is testing the products first in healthy human volunteers and later in patients who volunteer to participate in clinical trials.

The Helsinki Declaration
The World Medical Association Declaration of Helsinki requires that before any testing takes place in humans, as much as possible must be done to elucidate the efficacy and safety of a particular drug, including possible side effects.

Novo Nordisk welcomes the amendment of the Helsinki Declaration, adopted by the 52nd General Assembly of the World Medical Association in October 2000. This opens the possibility for testing in humans based, among other aspects, on data obtained from validated in vitro analyses without using living animals. But as long as such methods have not been fully developed, animal experiments will still be necessary in order to develop new products that are safe and effective and which can subsequently be approved by the regulatory authorities.

Despite these limitations, we are still working towards the reduction, refinement and replacement of animal experiments. While we continue to use animals, we make a serious effort to ensure that the animals used are being handled, housed and cared for in a way that respects the well-being of each individual animal.

Governing the use of animals
The authorities must approve all experiments with animals. As one of Denmark’s significant users of animals for experiments, Novo Nordisk acknowledges its responsibility to care for the animals and constantly work to improve the conditions under which they are kept.

During 2000 Novo Nordisk evaluated the benefits and usefulness of instituting an ethical review of animal experiments to precede the submission for approval by the authorities. In 2001 an ethical review committee with participation of lay people will be established to ensure high ethical standards in relation to animal experimentation.

We also work actively with animal welfare in the area of drug discovery, where the evaluation of drug development candidates must always include consideration of the Three Rs. Similarly, when projects move from research to development, the same considerations must be included in the project description. These requirements are included in the guidelines for management of discovery projects.

Engagement with stakeholders
The public debate about animal experiments is an important driving force for change. Therefore, we are further
developing our internal focus on animal ethics through dialogue and collaboration with key stakeholders. With the Danish Animal Welfare Society we have established a forum for dialogue in order to develop a common understanding of animal welfare issues and identify areas for improvement. Together we discuss and evaluate optimal conditions for housing experimental animals, ethical limits for animal experiments, better procedures and communication with the public about animal experiments.

In 2000 Novo Nordisk and the Danish Animal Welfare Society held a workshop and invited industry representatives and animal welfare experts to discuss ways of improving the welfare of animals. Novo Nordisk and the Danish Animal Welfare Society also had a joint exhibition booth during the annual congress Scand-LAS (the Scandinavian Society for Laboratory Animal Science) on experimental animals held in 2000 in Stockholm.

Housing of animals
It is important to consider housing when working with animals. During 2000 we focused on this issue with the goal of developing our own standards. Together with external experts and the Danish Animal Welfare Society we analysed the basic needs of most of the animal species used at Novo Nordisk and we looked at how to best fulfill these needs. As one of the results, new prototype systems were developed for housing dogs, rabbits, guinea pigs and rats that consider the needs of the animals. These systems are presently being evaluated as possible new standards for housing of experimental animals.

Fewer animals purchased in 2000
A 0.8% decrease in the total number of animals purchased in the Novo Group was achieved in 2000. More information is available in the Internet version of the report. Data for ZymoGenetics is not included in 2000.

How were the animals used in 2000?

Use of animals at Novozymes
The largest user of animals in the Novo Group is Novo Nordisk. However, a number of animals are also used by Novozymes. Animal testing in Novozymes is primarily aimed at elucidating potential toxicity, including the allergenic potential of enzymes. The testing, which is usually a regulatory requirement, ensures the safety of both consumers and employees.
INDEPENDENT REVIEW STATEMENTS

As last year, we have adopted a dual approach to quality assurance. At one level, we have commissioned a formal external verification that focuses on the accuracy of the quantitative data. This was undertaken by Deloitte & Touche. On another level, we have commissioned a broader overview that seeks to provide stakeholders with some assurance of the relevance and completeness of the report and its underlying processes. This overview was presented to us and appropriately presented.

Statement from Simon Zadek

Global Environmental Services
State Authorised Public Accountant (Denmark)
Copenhagen, 12 March 2001

Statement from Deloitte & Touche for the printed report

We have performed certain agreed-upon procedures on the Novo Group Environmental and Social Report 2000 and the related supplementary information on the Novo Group website (all referred to as the “Report”). The Report is in the responsibility of and has been approved by the management of the companies in the Novo Group. The scope of the Report and the aspects reported on have been decided by the management of the companies in the Novo Group and are described on page 4 (and in detail on the web). The Report has been prepared on the basis described on page 4.

The scope of our work and the procedures that we performed, which were agreed with the management of the companies in the Novo Group, are as stated below. Our work has been performed according to Professional Standards applied to State Authorised Public Accountants in Denmark. We visited the head-quarters of the companies in the Novo Group and the sites in Kalundborg and Bagsværd. Our procedures included interviews with corporate environmental and social management and those employees at the two sites responsible for compiling the data for the Report, as well as analytical procedures and testing samples of supporting documentation.

We accepted whether the data collection procedures, as described on page 4, were used at corporate level by the companies in the Novo Group to collect figures from reporting units:

- We read the Report and compared the figures reported for 2000 and previous years with the aggregated figures that were accumulated as a result of the procedures noted above. We have assessed whether the figures reported for 2000 and previous years are appropriately reflected in the Report.
- We reviewed the internal control procedures established at corporate level by the companies in the Novo Group to verify figures submitted from reporting units for inclusion in the Report. On a test basis, we compared the 2000 figures reported from a sample of four reporting units (Kalundborg, Bagsværd, Frederikshavn and Nykøbing) to the source documentation supporting the submitted figures.
- We compared the figures in the Report on environmentally related investments and costs to the source documentation presented to us and assessed whether these figures are appropriately presented in the Report.

The agreed-upon scope and procedures performed preclude us from providing an opinion as to whether all figures in the Report are complete and accurate.

Based upon the procedures performed it is our opinion that the Novo Group has applied detailed data collection procedures for the purpose of collecting figures from the reporting units for inclusion in the Report, and that the figures reported for 2000 and previous years, according to these data collection procedures, are appropriately reflected in the Report. Further, we find that the companies in the Novo Group have made reasonable endeavours at corporate level to verify the figures collected from reporting units for the Report; and for the four reporting units identified above, submitted figures are consistent with the source documentation presented to us. In addition, the figures on environmentally related investments and costs are consistent with the source documentation presented to us and appropriately presented.

Dr. Simon Zadek
London, 21 February 2001