REPLY

☐ I like the RWE Environmental Report 2000,

because

☐ I do not like the RWE Environmental Report 2000,

because

☐ I would like more information

on

Please send me

☐ the current Annual Report of RWE AG

☐ the current Social Report of RWE AG

☐ the study "Opportunities and risks of future world energy supply"

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Member of Dow Jones Sustainability Group Index 2000

RWE Environmental Report 2000

RWE
One Group.
Multi Utilities.

HIGHLIGHTS IN A NUTSHELL

Group portrait
Page 6

In autumn 1999, RWE adopted a far-reaching **reorganization and realignment** of its business operations. Energy generation, the network facilities as well as sales and marketing were unbundled, general overarching functions were pooled consistently. By selling the interests in o.tel.o and E-Plus, the Group has disposed of its most important shareholdings in the telecommunications division. This coincided with launching the **merger** with VEW AG which was approved by the shareholders at the extraordinary general meetings in June 2000.

Corporate guidelines
Page 14

The **guidelines** have been **updated** in line with the seven fields of action of sustainability as defined by RWE in the 1998 environmental report. They are binding for all divisions of the Group in terms of basic guidance and are supplemented by specific guidelines for individual companies.

Activities for sustainable development
Page 22

A **transfer seminar** was held in November 1999 in order to step up the exchange of experience on sustainable development. It was not only attended by the environmental protection officers of all Group divisions, but also by employees from marketing, research, development and human resources. The importance of the subject to the RWE Group was discussed by way of individual **case studies** on the seven fields of action.

Environmental management in the Group
Page 26

In October 1999, Jan Zilius, Executive Vice President in charge of Human Resources and Law at RWE AG, was appointed **new environmental coordinator** on the Executive Board. In 1999, RWE introduced **Group-wide environmental reporting** for the acquisition of data and distribution of information across the Group. **Framework requirements** were adopted for a more specific implementation of the environmental management guideline.

Status and outlook
Page 32

In 1999, RWE AG was accepted to the **Dow Jones Sustainability Index** comprising the 200 largest sustainable-management companies worldwide. In 2000, the first review was passed succesfully.

From the Group divisions

In this environmental report, the Group divisions have given for the first time an appraisal of the environmental aspects of selected products for their entire **lifecycle.** The presentation of **environmental indicators** is another improvement of the systematic analysis compared with the forerunner report.

The lignite-fired unit with optimized plant technology (BoA), currently being built by RWE Energie at Niederaußem, will achieve **efficiencies of more than 43 percent.**
Page 36

In October 1998, Rheinbraun obtained the **water-law permit for Garzweiler II.**
Page 52

RWE-DEA has integrated environmental protection into the existing management system and has already had all sites of its chemicals operations certified on the basis of **DIN EN ISO 14001.**
Page 64

All the domestic sites of Heidelberger Druckmaschinen have been validated on the basis of the EC Environmental Management Audit Scheme **(EMAS).**
Page 92

Since the end of 1999, the business segments of former Lahmeyer AG and of the NUKEM group have been merged in TESSAG Technische Systeme & Services Aktiengesellschaft, based in Frankfurt/Main, with the exception of Heidelberger Druckmaschinen AG. A **central environmental protection officer** coordinates the environmental activities of all subsidiaries and affiliates.
Page 100

HOCHTIEF is the first international construction group which has committed itself to the **Social standards of the International Labor Organization** (ILO) for its construction projects worldwide.
Page 118

RWE in dialog
Page 130

RWE's 1998 Environmental Report ranks 16th in the **environmental report ranking** of the 150 largest German companies in the magazine "Capital". At 348 of 500 points, it reached the first position among the conglomerates.

Puplished by:
RWE Aktiengesellschaft
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Content and data:
Akzente Kommunikationsberatung, Munich
in cooperation with AkkU Umweltberatung GmbH, Munich

Layout and design:
LANDOR Associates GmbH, Hamburg

Coordination:
NETWØRK GmbH, Hamburg

Photos:
RWE AG, Bernd Bodtländer

Lithography:
w&co Media Services GmbH & Co KG, Hamburg

Printed by:
Druckerei Grütter GmbH & CO, Ronnenberg

Printed on Heidelberg Speedmaster
Paper made from chlorine-free TCF

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	CONTENT		IN FOCUS
2	Foreword		
6	Group Portrait	**8**	Commitment to climate protection
11	Development of Environmental Protection		
14	Group Gidelines		
22	Activities for sustainable development		
26	Environmental Management in the Group		
32	Status and outlook		
34	Environmental program of the RWE Group		
36	■ Energy	**43**	VEW AG
		45	Heat-controlled combined-cycle plants
		47	Energy consensus
		48	Case Study "Fuel cell technology"
52	■ Mining and Raw Materials	**57**	Optimization of lignite power plant technology
		59	Current developments at Garzweiler II
		60	Methane extraction from coal seams
		61	Case study "Citizen participation"
64	■ Petroleum and Chemicals	**69**	On-shore oil production
		71	European car oil program
		76	Case study "Experience exchange program at CONDEA"
80	■ Environmental Services	**88**	Water management as a challenge for the future
		89	Case study "Innovative recycling concept"
92	■ Industrial Systems	**96**	Case study "Product development"
	■ Heidelberger Druckmaschinen	**113**	Promotion of renewable energies act
	■ TESSAG	**114**	Case study "Solar cell production"
	■ NUKEM		
118	■ Construction and Civil Engineering	**125**	Worldwide applicable social standards
		126	Case study "New business segment"
130	RWE in dialog		
132	Contacts in the Group		
134	Included companies		

Joint foreword of the Chief Executive Officer and the Environmental Coordinator.

"We are making headway". This could be the conclusion of this second environmental report of RWE AG. Conversely, however, it is also safe to say, that "we still have a long way to go". This would also be a fair assessment of our environmental protection performance record since our first environmental report was published in 1998. Both statements encourage us to develop environmental protection further and to firmly root "sustainable development" in our business activities.

The environment for our Group changed dramatically in the last two years. Deregulation of the energy markets in Germany and Europe led to competition of unprecedented intensity. At the same time, deregulation in Europe opens up fresh growth opportunities for the RWE Group in its core business of energy and energy-related services. We will rigorously seize these business opportunities.

Our response to these changes in the environment is "Multi Utility". We have focused rigorously on the needs of our customers and view ourselves today as an all-inclusive provider of electricity, gas, water, water treatment, waste disposal and recycling, petroleum and energy-related services. With a view to growing even stronger, we have teamed up with VEW AG, economically effective July 1, 2000. RWE and VEW are an excellent fit and can supply customers with a broad range of products and services reliably, conveniently and at attractive prices. In the "Group Portrait" chapter, you will find a more detailed description of our new Group and its strategic alignment.

Dr. Dietmar Kuhnt

Chief Executive Officer

Jan Zilius

Executive Vice President

for Human Resources and Law

Environmental Coordinator

Being a customer-centric service provider, we are well aware of the importance our customers attach to environmental protection. Especially in our core business, the supply of energy, but also in all the other business segments of our Group we have a particular responsibility for the environment, which is why we are in the limelight of the public. Our attention is not only focused on classical environmental protection, but also on the aspects of "economic success" and "social responsibility" equally underlying the guiding principle of sustainable development.

Our customers expect innovative and environmentally sound solutions. They demand products and services produced in a resource-conserving and socially compatible way. In order to meet these demands and to provide information on our services, we have tried for the first time in the 2000 environmental report to look at and describe the lifecycle of some of our products.

Not only customers and society, but also the capital markets are increasingly looking at our commitment to environmental protection and sustainable development. Analysts from all over the world are asking us about concepts and concrete measures designed to safeguard our natural resources and ensure sustainable development. These inquiries are based on the idea that companies acting in an economically, ecologically and socially responsible way will be more successful in the market in the long run than other players. This goes to show that even under the conditions of heightening global competition, environmental protection and growing shareholder value are not in conflict. This is why we are happy about RWE being admitted to the Dow Jones Sustainability Index comprising about 200 of the largest companies worldwide leading in their respective industries with respect to sustainable development.

We will continue to develop the concept of sustainable development in the RWE Group and also promote it outside our Group. In the summer of 2000, we joined as an active member the forum for sustainable development of Bundesverband der Deutschen Industrie (BDI) e. V. which has committed itself to promoting sustainable management in Germany.

The present report is a "classical" environmental report, making our readers familiar with the most important environmental aspects of our activities. It also provides an overview of our commitment to sustainable development in the last two years. You will find outstanding examples of innovative concepts in our Group, e.g. fuel cell technology, the lignite-fired power plant with optimized technology (BoA), the solar cell manufacture of TESSAG-ASE or new drilling technologies to produce oil from the mudflats of the North Sea. We have furthermore backed up with concrete projects the "fields of action for sustainable development" defined back in 1998.

Despite the large number of activities, we have kept the description clear and concise. As in the 1998 report, you find for each Group division a descriptive and statistical part. The latter is based on an EDP-assisted environmental reporting and information system enabling us to acquire and evaluate relevant environmental data of the Group in a comprehensive, precise and timely fashion. Compared with 1998, the data section is now more complete, and a description of selected, informative indicators has been added to the input-output balances.

And finally, we would like to invite you to enter into a dialog with us. At the end of this report you will find a feedback card, and you can of course also contact us on the Internet at www.rwe.de. Please let us know what you like or dislike about this report and let us have your feedback as to how we can improve even further in the future.

We hope you will enjoy reading our report.

Strong and fit for competition.

Since the last RWE environmental report was published in 1998, our Group has undergone radical change. Deregulation of the European and especially the German energy markets led to competition of unprecedented momentum.

Falling energy prices require, on the one hand, a clear focus on core skills as well as cost cuts across all divisions. On the other hand, the development of a Pan-European market for energy services also opens up opportunities for individual companies to expand markets and to open up new ones.

As early as last year, RWE started to gear up rigorously for these changes in the environment. The focus on "Multi Utility" enables us to fully bring our existing competitive edge to bear and to open up at the same time new market potential. We are focused entirely on the customers and their needs as an all-inclusive provider of electricity, gas, water, sewage treatment, waste disposal and recycling, petroleum and energy-related services. "Multi Energy" means supplying the energy sources of coal, gas, oil and electricity as attractively priced and efficiently as possible, either from the company's own resources or by way of external purchasing through our trading activities. By using and developing our strengths through Multi Utility/Multi Energy at all levels of the value chain, we will expand our position as a leading provider of energy and energy-related services on a Europe-wide basis.

The realignment of our Group strategy coincided with the merger with VEW AG. Merging RWE and VEW is a major step ahead and creates a Group with annual net sales of approx. 52 billion euros and some 170,000 employees. worldwide. Being the third-largest multi-utility provider in Europe, the new company, which will keep the name RWE, will be number one in Germany for electricity and water supplies as well as waste management. It will rank second among Germany's gas suppliers. A new organizational structure for the RWE Group was created as part of the strategic realignment. While the principle of integrated management of our seven Group divisions prevailed in the past, the management holding company now controls the operating companies directly and assumes responsibility for the core segments of Multi Utility and Multi Energy.

It is up to the independent head companies operating at arm's length in the market to run their operative business. The most important reforms include breaking up the previously integrated value chain which comprised exploration and production, generation, trading, the network as well as sales and marketing. Each of these levels will in the future have to hold its own independently in the market and prove its competitiveness. RWE has largely pulled out of telecommunications.

Climate protection is one of the central themes of our times. It has still not been scientifically proven beyond doubt that and to what extent global warming is anthropogenic. For precautionary reasons, the international political arena has taken far-reaching decisions to reduce worldwide greenhouse gas emissions. Germany and Europe are taking the lead here. Being Germany's largest and Europe's third-largest energy utility, RWE regards climate protection as a central task which will remain extremely important in the future in terms of environmental and economic policy.

The climate protection program of the RWE Group is also an important part of the "Statement of VDEW on climate protection" of 1995, in which the German electricity producers undertook to reduce their CO_2 emissions by 12.5 percent compared with 1990 by 2015 (> www.strom.de). At the heart of RWE's activities is a comprehensive power plant renewal program under which existing power plants are upgraded and new, more efficient power plants are planned and erected (> p. 45 and 57). As a result, CO_2 emissions can be cut by up to 10 million tons annually whilst keeping power generation output unchanged. Other steps are the promotion of renewable energies, rational use of energy and of forward-looking technologies. Moreover, RWE is involved in various international research and development projects (> p. 17).

The petroleum industry, in which our Petroleum division plays an active part, has also committed itself voluntarily to reduce the specific fuel oil consumption in the indoor heating market by 25 percent between 1990 and 2005. This is equivalent to a reduction of approx. 20 million tons of CO_2. The voluntary commitment of the association of the chemical industry (VCI), which includes our chemicals arm, aims to cut both specific energy consumption and energy-related CO_2 emissions by more than 30 percent between 1999 and 2005 (> p. 66).

www.strom.de

OUR NEW STRUCTURE

In the present environmental report covering 1998 and 1999, our activities are still structured on the basis of the previous organization. In line with the concentration of the Group on energy and energy relevant services (Multi Utility), however, they will in future be structured as follows:

- **RWE Plus AG** (sales and marketing company) will essentially consist of the sales and marketing organizations of RWE Energie and VEW Energie (> p. 43). Here the customer can obtain all products from a one-stop shop and hence from a single point of contact. In order to ensure one face to the customer, RWE Plus AG will coordinate marketing strategies, catering for the various customer segments as well as the development of products and marketing strategies in close consultation with other companies of the Group.
- The gas activities will be bundled under the guidance of **RWE Gas AG** (provided the consent of the governing bodies).

INTERNATIONAL COMMITMENT Since it is irrelevant for global climate protection where greenhouse gas emissions are actually reduced, initiatives and projects should be launched where the associated costs are lowest. Potential efficiencies can be harnessed effectively by so-called Kyoto mechanisms mentioned in the Kyoto Protocol: Joint implementation (joint projects among industrialized countries), clean development mechanism (joint projects among industrialized and developing countries) and emission trading (trading of emission rights between industrialized countries) (> www.unfccc.de). Transnational climate protection initiatives, in which RWE is playing an active part, are thus among the most important elements of the ongoing climate protection negotiations at international level. Indeed, RWE is the only German energy utility involved in the "Prototype Carbon Fund" (PCF) of the World Bank, funded with some USD 160 million to test the practical implementation of the Kyoto mechanisms. Other participants of this unique project worldwide are leading companies from Japan, Canada and the European Union, which do not only come from the energy industry, but also from the sector of finance (www.prototypecarbonfund.org).

The E7 initiative (www.e7.org), a grouping of eight worldwide leading energy utilities, of which RWE is a member, also pursues international climate protection projects designed to promote sustainable energy supply. Numerous pioneering projects have already been carried out in central and eastern Europe as well as in newly industrialized and developing countries. They include efficiency improvements in fossil-fired power plants in Jordan, building up electricity supplies from wind and solar energy independent from any power grid in Indonesia as well as the construction of a hydroelectric power plant in Zimbabwe.

Transnational cooperation has also been established by RWE when building a power plant for ŠKODA in the Czech Republic. Following acknowledgement of this project as national climate protection project by the Federal Ministry of the Environment, Nature Conservation and Reactor Safety, official recognition by the Czech authorities followed in April 2000 (> p. 44).

www.unfccc.de **www.prototypecarbonfund.org** **www.e7.org**

- The activities of **RWE Umwelt AG**, Trienekens und EDELHOFF will be merged in RWE Umwelt AG (environmental services).
- **RWE Net AG** (network facilities) will comprise all electricity system activities of RWE and VEW.
- **RWE Trading GmbH** (trading) will pool all trading activities of the Group and will procure primary energies for the generation sector.
- **RWE Power AG** (generation) will have overall responsibility for all power plants of the new Group with the exception of the lignite-fired power plants.
- **RWE Rheinbraun AG** (power generation from lignite) will pool the mining of and power generation from lignite as well as our involvement in international hard-coal mining. The generation strategy as well as the deployment and scheduling of power plants will be defined in close consultation with **RWE Power AG.**
- **RWE-DEA AG** (excluding the chemicals operations) and **TESSAG** will keep their present structure but will be incorporated into the Multi-Utility and Multi-Energy coordination.
- **RWE Systems AG** will render cross-Group services enabling the operative companies to focus on their core business. These services range from data processing through materials management right down to real estate and facility management.

Our companies outside the core business will be managed as financial participations. They include **HOCHTIEF, Heidelberger Druckmaschinen, HARPEN** and, up to its sale, the chemicals operations of RWE-DEA.

ENVIRONMENTAL PROTECTION IN THE NEW RWE GROUP

In the new RWE Group, too, environmental protection plays a central role. This is why the previous organization of environmental protection will be transferred to the new Group with the necessary adjustments. The holding company will thus remain responsible for the coordination of environmental protection in the Group as well as for functions and activities of a cross-Group nature. The operative and legal responsibility for environmental protection will continue to rest with the head companies (> p. 26 – "Environmental management in the Group").

Basis for action.

While environmental protection was based very much on the legal pollution control regulations until the end of the 80s, the emphasis has shifted for a number of years to voluntary commitments and innovative action as an integral part of production and products. As a result, the interdivisional organization and coordination of environmental protection moves to center stage.

Progress towards the aim of sustainable development requires efforts that go beyond individual measures and pursue an integrated strategy for resource conservation and climate protection while at the same time meeting economic and social interests. In the last few years, the RWE Group companies have optimized their organizational setup and contributed with numerous innovations to continuous improvements of environmental protection. The cross-Group organization and coordination of environmental protection provide an excellent basis of actively taking on these challenges.

1971 First pilot plants for flue-gas desulphurization

1979 Creation of the environmental protection department

1980 Establishment of a department for environmental protection at Rheinbraun

Creation of environmental protection units in the operating divisions

1981 Commissioning of the first resource recovery plant at Trienekens in Neuss

1983 Emission control programs for flue gas from power plants and furnaces

1985 Appointment of a central environmental protection officer

Construction of the Amstetten plant of Heidelberger Druckmaschinen using latest state-of-the-art environmental technology

1986 Compilation of the organizational regulations in the "Environmental Guidelines of RWE AG"

Emission reduction by installing vapor recovery systems in refineries and tank farms

Creation of central department for "environmental protection and technology" at Lahmeyer International

1988 Creation of the department for soil and groundwater clean-up

1990 First plant in Germany for dismantling of refrigeration equipment with complete CFC recovery at Bresch

1991 Creation of an environmental protection department at LAUBAG

Creation of the corporate unit for environmental protection, commitment of CONDEA to the Responsible Care Initiative, launch of the DEA oil vendor

1992 First internal environmental audit

Upgrading of service stations: vapor recovery systems and sealing of driveways

1993 Retrofit program for the turbines of thermal power plants until 1997

Introduction of the environmental impact assessment to the planning permission proceedings for lignite mining

Creation of an environmental management system

Environmental management guidelines and annual environmental report at Heidelberger Druckmaschinen

1994 Environmental protection guideline of RWE Energie

European Transport Award for DEA oil vendor "Lubricants"

1995 First plant for dry mechanical treatment of electronic scrap

Switch to CFC-free polyurethane foams at Maquet

1996 Brochure "Environmental Protection at RWE"

Certification of operating units for waste management

Registration of Heidelberg's plant in Amstetten pursuant to EMAS

1997
- Appointment of an environmental coordinator on the Executive Board
- "Environmental protection commitment" guidelines take effect

1998
- Establishment of corporate unit for environmental protection
- Introduction of an environmental management system
- Publication of the first systematic environmental report
- Foundation stone laid for the first lignite-fired power plant with optimized technology and 43 percent efficiency
- Introduction of software for handling hazardous substances, wastes and hazardous goods
- Appointment of environmental protection spokesmen for opencast mines and factories
- Development of environmental guidelines
- Beginning of waste-to-energy scheme for used wood in the Berrenrath power plant of Rheinbraun
- Commissioning of the Brunsbüttel hazardous waste incineration plant as one of the most modern plants in Europe
- Environmental policy and guidelines at LAHMEYER
- Environmental management system pursuant to DIN EN ISO 14001 at Piller-GmbH, Mechernich plant
- Appointment of an environmental protection officer for the NUKEM group

1999
- Establishment of a Group-wide environmental reporting system
- Approval of lignite FGD gypsum as product
- Introduction of the environmental handbook at Rheinbraun
- Upgrading of plants for compliance with the car oil program
- Certification pursuant to DIN EN ISO 14001 and EMAS revalidation of CONDEA site
- Title of "Eco Manager of the year" awarded to the Chief Executive Officer of Heidelberger Druckmaschinen
- SCC Certification (Safety Certificate Contractors) of TESSAG SAG assembly company and of TESSAG SAG power plant and industrial plant engineering
- Revision of management book and addition of reporting system for environmental accidents
- Certification of HOCHTIEF Umwelt for waste management

2000
- Successful certification pursuant to DIN EN ISO 14001 of all other sites of CONDEA and revalidation of two CONDEA sites pursuant to EMAS
- Development of environmental management at TESSAG
- SCC certification of TESSAG Rheinelektra Technik GmbH
- Validation of all domestic sites of Heidelberger Druckmaschinen pursuant to EMAS (excluding the new sites added in 1999).

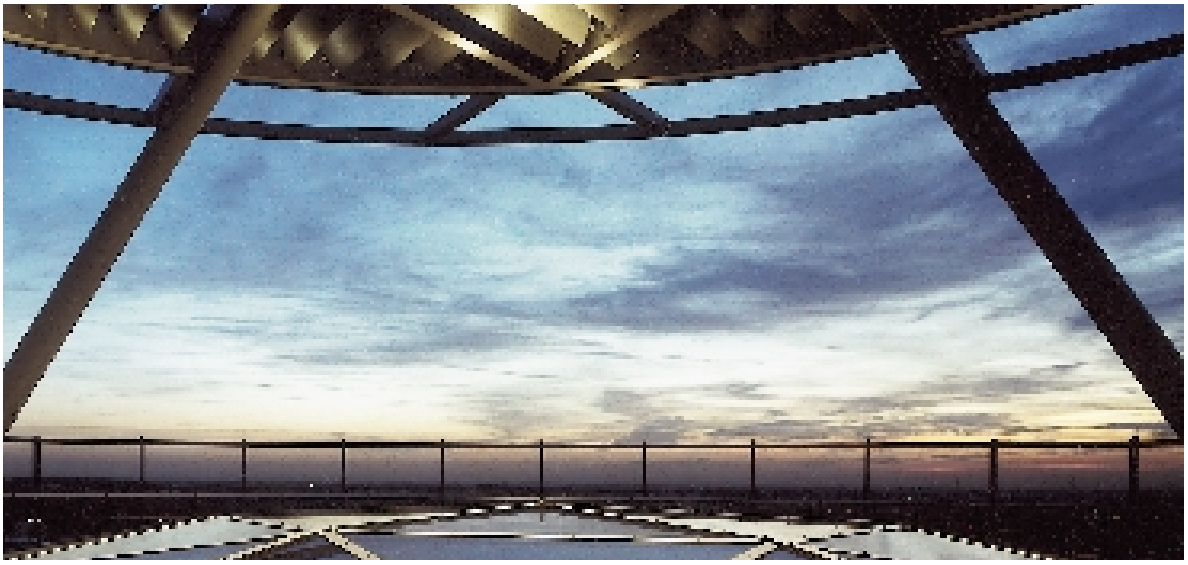
Shaping the future.

In 1998, we defined fields of action and presented them in the environmental report with a view to continuing sustainable development of the RWE Group. The discussion of the last two years has shown that these activities are well suited to serve as guidelines for the Group to align itself with criteria of sustainable development.

These guidelines are now the result of the development of our environmental protection guidelines in the Group. We have backed them up with brief examples of our activities in order to trace the development of the last few years. A detailed case study of sustainable development implementation has also been provided for each of the Group divisions.

The specific environmental guidelines drawn up by the Group companies to round out and give more tangible form to the Group statements of recent years remain in place for the individual divisions:

- Rheinbraun (> p. 54)
- RWE-DEA (> www.rwe-dea.de)
- RWE Umwelt (> Environmental Guidelines 5/99)
- Heidelberger Druckmaschinen (> www.heidelberg.com)
- TESSAG (> p. 102 and www.tessag.com)
- HOCHTIEF (> Management Book 1/99)



PREAMBLE

RWE has accepted a special responsibility to contribute to sustainable development. We have defined fields of action in which we want to stand out by a particular commitment and innovative solutions. They are reflected in the following guidelines.

1. We safeguard stable economic development of our Group by long-term planning.

We have deliberately chosen long-term and continuous value growth as one of our goals. Meeting the expectations of our customers and shareholders as well as safeguarding existing jobs requires stable and successful economic development of our Group. Forward-looking planning serves to safeguard existing business segments as well as to develop new ones and create additional jobs.

■ **Power grid as medium:** In a showhouse in Essen, RWE Energie demonstrates what digital households may look like in the future and what contribution the company will make: Data will be transferred and exchanged between appliances via the power grid by means of Powerline technology.

■ **New drilling technology:** Using the so-called extended-reach drilling technology, the consortium of RWE-DEA and Wintershall has applied and advanced a concept which is so far unique in Germany, in order to develop the largest German crude oil deposit Mittelplate also from an onshore site. The concept ensures long-term and environmentally sound crude oil production.

■ **Service as business segment:** The wide-ranging basic necessities have become a major economic factor for service stations. DEA Shop Service GmbH was established in 1999 in order to further enhance the consulting activities for service stations and brand partners of DEA in this fast-growing business.

■ **Decentralized solutions:** In February 2000, RWE Umwelt presented a new concept for small thermal treatment plants enabling the company to offer decentralized refuse incinerators at attractive costs. The small-scale refuse incinerators for volumes of 50,000 and 75,000 tons annually contribute to implementing the German technical guideline on residential waste (TASI) in sparsely populated regions.

■ **E-Commerce:** RWE Umwelt entered electronic commerce by processing container services through the Internet.

■ **New markets:** By acquiring Turner Corporation based in New York, HOCHTIEF has entered the North-American market which holds great promise for the future.

2. By promoting developments in the energy industry through innovative technologies and new products we contribute to improving environmental protection.

The energy industry has a particular role to play when it comes to conserving resources and reducing noxious emissions. We are making an important contribution by using energy efficiently. We intend to open up fresh potential, for instance, by increasing the use of renewable energies, cogeneration and new technologies.

■ **Scientific projects:** RWE is sponsoring a project with the International Energy Agency (IEA) to explore technologies designed to reduce the greenhouse effect (> www.ieagreen.org.uk). Jointly with Rheinbraun, RWE is partner of the "Global Change" project at the Massachusetts Institute of Technology (MIT) to study climatological and economic aspects of climate protection (> web.mit.edu/globalchange/www).

■ **Co-generation:** The power station of CONDEA's Meerbeck plant generates electricity through cogeneration also using the steam of a chemical plant operated by an affiliated company on the plant site.

■ **Low-energy buildings:** HOCHTIEF developed concepts for passive houses and low-energy sportshalls in the context of research and development projects designed to reduce the energy consumption of buildings (> p. 123).

■ **Methane gas recovery:** Since 1991, CONSOL Energy Inc., a subsidiary of Rheinbraun, has recovered the methane obtained from gas removal drilling operations before coal mining in order to make a contribution to climate protection. (> p.60).

3. We contribute to resource conservation by implementing the recycling economy.

Aligning economic processes with the recycling principle is crucial for sustainable development. This approach includes intelligent production processes which help to cut the consumption of raw materials and water and to keep waste volumes to a minimum. Using resources responsibly contributes to the economic success because it involves significant cost reductions.

■ **Substitute fuels:** By processing 200,000 tons annually of commercial and industrial wastes to secondary fuels, RWE Umwelt reduces the consumption of fossil resources and improves the CO_2 balance.

The co-combustion of sewage sludge and used wood in the power plants of Rheinbraun partly replaces lignite as standard fuel. The heat obtained from the CHP process is used for lignite drying.

■ **Cycle management:** TESSAG SGB, Piller and Maquet reduced their water consumption in the last three years by close to a third through improved cycle management.

■ **Soil management:** A soil management process designed to contribute to conserving resources by materials cycle management has been developed by Flughafen Düsseldorf GmbH, in which HOCHTIEF Airport has an interest, when rebuilding the Düsseldorf International Airport (>p. 123).

www.ieagreen.org.uk web.mit.edu/globalchange/www

4. We are aligning our product policy with ecological criteria.

Ecological criteria have to be observed already at the planning stage in order to supply products and services which are as environmentally sound as possible in all phases. To this end, future needs of our customers and of society at large have to be identified and taken into consideration early on.

■ **Eco power:** With Avanza Eco power, RWE Energie offers a certified product exclusively produced by solar, hydroelectric and wind power plants. The revenues are reinvested in plants for environmentally sound energy generation.

■ **Vegetable base:** DEA identified the environmental benefits of synthesis technology early on and has offered high-performance lubricants on a vegetable base since the middle of the 90s.

■ **Reduced sulfur content:** Although not a mondatory requirement in Europe, the gasoline grade Super Plus with an extremely low maximum sulfur content of 50 ppm has been available from DEA since January 2000 (> p. 71).

■ **PCB-free:** TESSAG Starkstrom-Gerätebau (SGB) has developed environment-friendly cooling concepts working with air or PCB-free oils for its dry-type cast-resin and distribution transformers.

■ **Solar module:** The semi-transparent thin-layer solar modules, offered by TESSAG Solartechnik (ASE), cannot only be used for the environmentally sound generation of electricity, but also for controlling the input of light and heat to buildings (> p. 114).

■ **Groundwater recycling:** Rheinbraun increasingly returns the pumped-up water through seepage plants to the groundwater table in order to minimize the impact of lignite mining especially on marshlands.

5. We take our social responsibility very seriously.

Being a large Group, we bear a major share of social responsibility which we discharge by offering apprenticeships, helping shape a forward-looking infrastructure, participating in the debate on social issues and problems and by developing solutions based on consensus.

■ **Youth foundation:** On the occasion of its 100th anniversary in 1998, RWE established a youth foundation and funded it with DM 30 million. It sponsors projects contributing to a healthy future for children and young people.

■ **Business creation contest:** As one of eleven sponsors, Dietmar Kuhnt, President and Chief Executive Officer of RWE AG, supports the "StartUp 2000" contest organized by the "Stern" magazine, savings banks and McKinsey consultancy to help business creators.

■ **Employment initiative:** In 1999, RWE provided DM 20 million for skilling and retooling measures in the human resources sector for the next three years as part of its employment initiative. Young unemployed, for whom it is difficult to find new jobs, are, among other things, prepared for RWE recruitment tests in a one-year course.

■ **Apprenticeships:** In 1999, RWE-DEA set a new record with a training ratio of 5.2 percent, up one percent on the year before. Rheinbraun even reached a ratio of 6.1 percent. LAUBAG so far made available some 100 apprenticeships to improve the training situation in Lusatia even without any recruitment needs within the company.

■ **Infrastructure project:** Rheinbraun and RWE Energie are jointly involved in rebuilding the industrial estate at Hürth-Knapsack as a technology and business creation center sponsored by the Economics Ministry of North Rhine-Westphalia.

■ **Dialog with users:** TESSAG Maquet set up an international training and exhibition center for physicians and nursing staff in Rastatt. The Surgical Academy is also a forum for dialog between industry, science and users.

■ **Disaster relief:** Streif Baulogistik supported a shipment of relief supplies to Romania contributing a truck and two drivers from the Essen plant. Rheinbraun donated 2,000 tons of lignite briquettes to supply refugees in Kosovo with heat.

6. We rely on qualification and involvement of our employees.

Successful corporate development is based on qualified and motivated employees. We support their qualifications at all levels by targeted further training. Wide-ranging schemes also help to increase responsibility and individual initiative among our employees and to meet their specific individual needs.

■ **Transfer seminars:** RWE organizes two-day transfer seminars to involve employees in the discussion on new challenges across divisions and companies. In 1998, environmental management was the subject of such a meeting, while sustainable development was discussed in 1999.

■ **Family-oriented working hours:** In 1998, the Executive Board and Works Council of Rheinbraun agreed on a scheme designed to promote part-time work under a wider company agreement.

■ **Industrial safety:** Every year, CONDEA presents the "Global Safety Award" to promote industrial safety. The 1998/99 "Global Safety Award" was presented to sites that either had no accident in the past fiscal year, reduced the number of accidents by more than 50 percent compared with the average between 1994 and 1996 or had fewer accidents in the past business year than a year earlier.

■ **Further training:** In fiscal 1998/99, RWE Umwelt conducted 986 seminars comprising 7,706 attendance days for 3,855 employees to improve job-related skills and social competence.

■ **Individual promotion:** In 1998, HOCHTIEF developed the job familiarization scheme "Blue Chip" which is so to speak the admission ticket to the company. Jointly with the new employees, individual programs are developed for job familiarization and development. This includes interdivisional job rotation and personal skilling measures. HOCHTIEF is seeking to recruit more qualified university graduates with this scheme.

■ **Stock option program:** The RWE Group has launched a stock option program for all employees in addition to the staff share scheme which has existed for more than 20 years.

7. We promote sustainable development worldwide by the transfer of our know-how.

A lot can be done for sustainable development if know-how and standards are transferred to countries which have not yet reached our level of development in building up their infrastructure and industry. We can contribute to this in two ways: Through our subsidiaries and affiliates as well as by giving expert advice to and supporting development projects.

■ **E7 Initiative:** As a member of the E7 Group, comprising eight of the largest energy utilities worldwide, RWE contributes with its know-how and experience to establishing environmentally sound electricity generation in developing countries. A fund set up by the Group in 1998 is designed to support financially exemplary projects for sustainable energy supply.

■ **Efficient energy generation:** RWE Energie is involved in the erection of the first combined-cycle power plant in Portugal. The plant near Porto generates almost a fourth of the national electricity demand.

■ **Pollution control:** Although the pollution control standards of the European Union, which have been taken over by the Hungarian Environmental Ministry, will not be mandatory until January 1, 2005, the consortium lead-management by RWE Energie for the Matra power plant decided to make pollution-control investments so that the targets will be reached as early as October 2000.

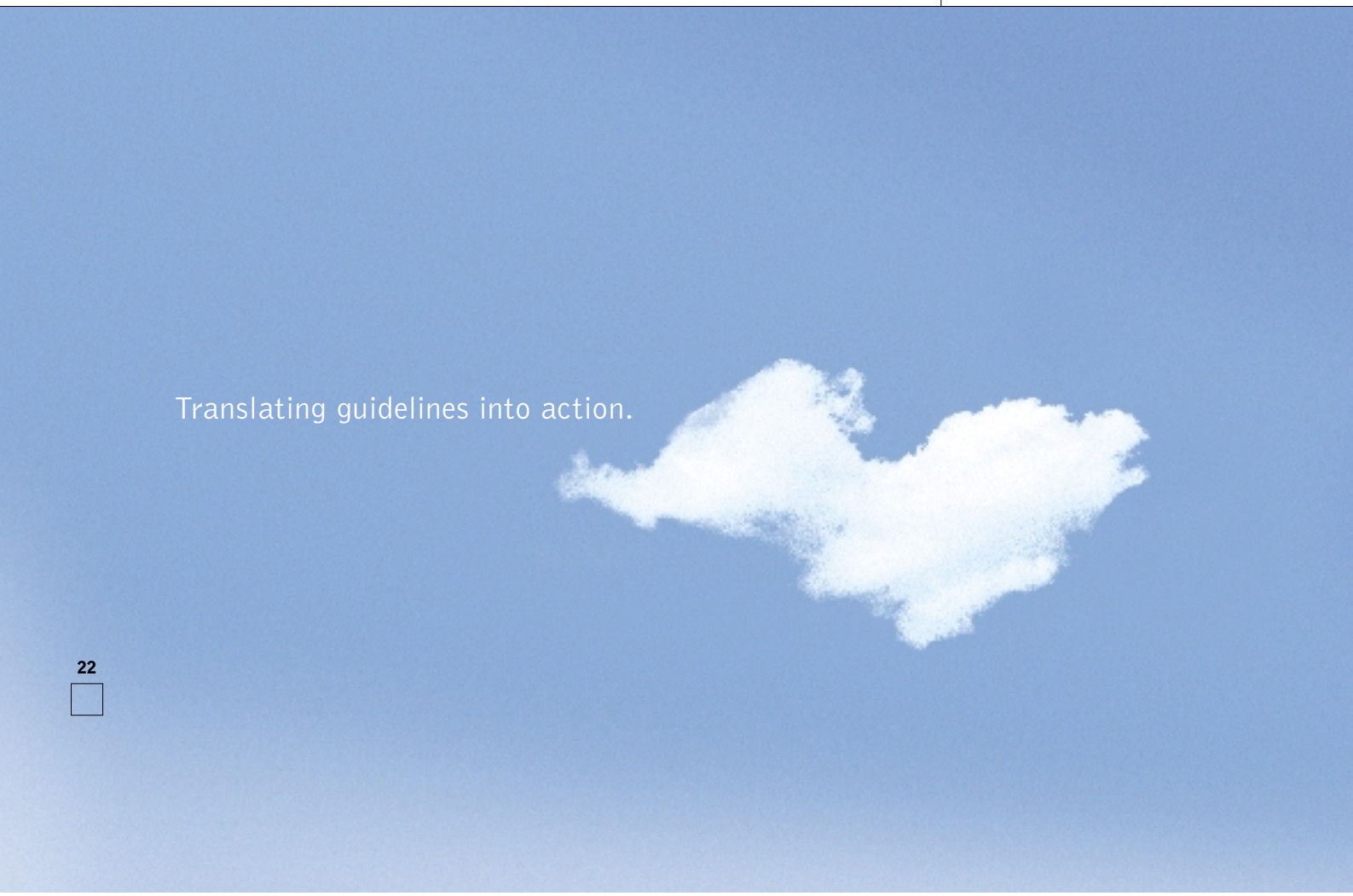
■ **Experience exchange program:** CONDEA established the so-called Technology Exchange Network to foster the transfer of know-how between the sites worldwide (> p. 76).

■ **Mining know-how:** Rheinbraun Engineering markets the know-how, collected in its own sphere and by Rheinbraun, comprising technical, organizational and economic aspects relating to the mining and handling of near-surface energy resources and minerals. A major criterion for almost all consultations, studies and projects is the consideration of environmental concerns and the social outline conditions without which no project funding is possible at the moment. The Environmental and Social Policies and Guidelines of the World Bank and the International Monetary Fund are applied in this context.

■ **International principles:** The five "Basic Principles" summarized in a policy statement are mandatory for all sites of CONDEA. This is to ensure that similar standards apply worldwide at the individual locations in the fields of environmental protection, health and safety.

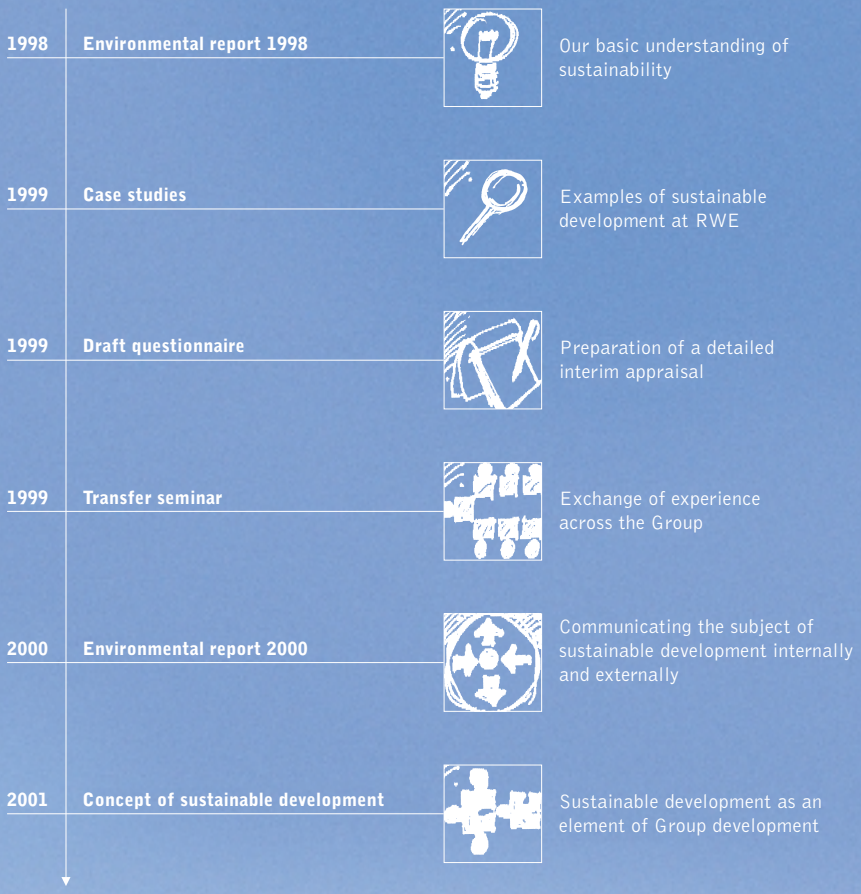
■ **Virtual university:** ERM Lahmeyer International is designing a virtual university in cooperation with the World Business Council of Sustainable Development (WBCSD). It is to serve as a worldwide platform for universities and industrial companies, promote communication about sustainable development and support learning processes.

■ **International social standards:** HOCHTIEF has agreed social standards applicable worldwide with IG Bau (trade union for the building industry) (> p. 125).



Translating guidelines into action.

As a large corporate Group we feel a particular obligation to actively address the subject of sustainability and to help shape sustainable development. This is a major challenge, especially since the subject has so far been discussed a lot in politics and science although there are still no concrete ideas as to how the issue should be addressed. Indeed, we deliberately broke new ground in 1998 and defined concrete fields of action.



OUR APPROACH

We sketched out our basic understanding of sustainability in the 1998 environmental report by means of seven fields of action and exemplary projects from the Group divisions. We believed that this description would serve to make the abstract subject more concrete for employees as well as the public and to establish the relationship to what happens in the company. Since the exchange of experience and learning from other people should take center stage, every Group division selected one of the fields of action in 1999 for which it prepared an exemplary project implementing sustainable development. The results of these case studies, as we call them, were jointly discussed and collected in a transfer seminar at a later stage.

CASE STUDIES ON SUSTAINABLE DEVELOPMENT

These case studies on sustainability were designed to describe origin and progress of the projects. They were also designed to investigate their economic, ecological and social benefit and whether they can be transferred to other Group divisions.

- **Field of action "Safeguarding stable economic development by long-term planning"**
  New business segment at HOCHTIEF (> p. 126)
- **Field of action "Development of the energy industry"**
  Fuel cell technology at RWE Energie (> p. 48) and Solar cell production at ASE (> p. 114)
- **Field of action "Implementing the recycling economy"**
  Innovative recycling concept at RWE Umwelt (> p. 89)
- **Field of action "Aligning product policy with ecological criteria"**
  Product development at Heidelberger Druckmaschinen (> p. 96)
- **Field of action "Discharging of social responsibility"**
  Citizen partizipation at Rheinbraun (> p. 61)
- **Field of action "Transfer of know-how to promote sustainable development worldwide"**
  Experience exchange program at CONDEA (> p. 76)

QUESTIONNAIRE ON SUSTAINABILITY

We backed this up by developing a questionnaire broken down in the seven fields of action and providing an interim appraisal of the sustainable development status in the Group divisions. Since we wanted to find out first which questions were appropriate, the Group divisions developed in a first step only the questions for their selected field of action. Combining them results in a questionnaire covering all aspects of sustainable economic management in the RWE Group. In the future, it is to serve as a self-assessment tool so as to safeguard the continuity of our action. After all, we are convinced that it will be increasingly important for us to rigorously pursue these aims since their achievement will be reflected in the valuation of our company by the market and society.

TRANSFER SEMINAR ON SUSTAINABILITY

A network is to carry the idea of sustainable development to all divisions and levels of the Group. This was initiated by a two-day transfer seminar attended by representatives of all Group divisions in November 1999. Based on the case studies presented, the participants discussed not only about their understanding of sustainability and its importance to the RWE Group, but they also looked at success criteria for projects contributing to sustainable development.

Quite a few case studies produced surprise effects. What initially was obviously "only" supposed to improve communication, contributed a lot to stable economic development on closer examination. The selected examples, regardless of whether they related to communication or product development projects, revealed a dilemma. Especially, for long-term projects the economic benefit is very difficult to quantify at the outset. The participants concluded that those who were exclusively focused on short-term economic benefit may indeed miss great opportuni-

ties. Thinking in a wider context and beyond individual Group divisions is therefore an essential requirement for sustainable action. Credibility and open communication as well as an active forward-looking strategy in the market may be key factors for success in this context.

The most important result of the transfer seminar may be the realization that sustainability can have many faces. However different the aims of the various projects were, they all contribute to sustainable development, some of them indeed to a high degree. After all, they all have one thing in common: They pursue a long-term perspective and do not leave social and ecological effects to chance. The participants recommended that assessment criteria for sustainable development should in the future be available to all responsible employees in order to continue this approach consistently at RWE (> p 32 "Status and outlook").

Consistent structure.

Effective environmental protection and forward-looking solutions require firm integration into all business processes. Systematic and consistent environmental management tailored to the structural needs in the RWE Group provides the basis for this.

The holding company performs functions of a coordinating and general nature. The Group divisions are in charge of their operations and are thus also responsible for effective and appropriate implementation of environmental protection. The way in which the holding company and Group divisions work together in the area of environmental management will be explained in the following. The respective chapters provide information on the organization of environmental protection in the individual Group divisions.

ENVIRONMENTAL COORDINATION

Since October 1999, Jan Zilius, responsible for Human Resources and Law on the Executive Board of RWE AG, has been environmental coordinator of the Group. In performing this function he is supported by the corporate environmental coordination department. The steering group environmental protection comprising the Executive Board members responsible for environmental protection in the Group divisions and the environmental coordinator, meets twice a year as interface between holding company and Group divisions. In technical terms, it is supported by the permanent staff of the environmental protection officers meeting every three months and as required.

EXPANSION OF ENVIRONMENTAL MANAGEMENT

"Framework requirements for environmental management in the RWE Group" have been developed in addition to the Group guidelines. They are meant for the management companies and the immediate subsidiaries and affiliates of RWE AG and define key criteria for their environmental management. Basically they recommend to observe the requirements of the international environmental management standard DIN EN ISO 14001 or of EMAS to the extent that they are applicable. The environmental management of foreign subsidiaries and affiliates should be structured in such a way that the environmental standards of advanced industrial regions are adhered to.

Since the framework requirements include detailed criteria, they enable the status of environmental management in the Group divisions to be assessed regularly.

The following criteria should always be met by the Group divisions:

- drawing up a company-specific environmental policy,
- development of environmental programs with targets and measures,
- documentation of the organizational and operational structure for environmental protection,
- appointment of persons responsible for environmental management and environmental protection,

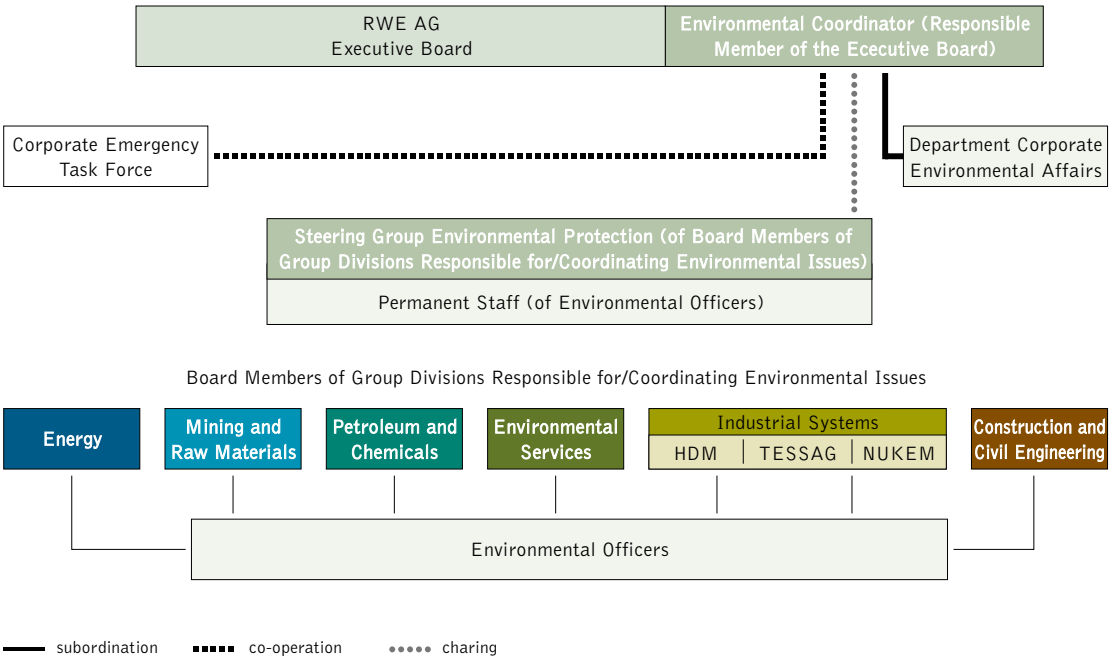
- documentation of duties arising from public-law regulations, licenses, approvals, etc., to the extent that they relate to environmental protection,
- description of the measures taken to integrate environmental protection into the business processes,
- introduction of a reporting, monitoring and control system designed to implement the required measures and to optimize environmental management,
- training of employees, performing environmental activities,
- rules and regulations on accident and crisis management.

Guidelines or provisions have meanwhile been developed and put into practice in Group divisions where there were still no regulations on environmental protection. Rheinbraun, for instance, formulated a company-specific environmental policy in 1998 (> p. 54); TESSAG, the successor company of Lahmeyer AG, built up a detailed environmental protection organization and appointed a central environmental protection officer (> p. 103); RWE Umwelt adopted a guideline on environmental, quality and safety management in 1999 and the company-specific environmental guidelines were revised (> p. 82); at HOCHTIEF, a reporting system for environmental accidents was set up in 1999 (> p. 122).

RISK MANAGEMENT

In 1999, the Executive Board adopted the "Internal Guideline on the Organization of Risk Management at RWE AG" in order to control the risk management in the Group divisions and to get an overview at corporate Group level of all business risks. The Group companies now report the risks identified in their sphere of operations on an annual basis. These risks are then summarized and assessed in a risk map.

In addition to this, the outline requirements on environmental management include detailed regulations on environmental risk precautions and accident reporting. The Group divisions are supposed to identify, record and document major hazards and risks which are caused by plant operation or may arise when rendering services. Similar regulations apply to risks associated with residual pollution.



The companies have to

- have in place adequate safety systems in their plants and monitor them regularly;
- define adequate safety organizations and procedures;
- define emergency and disaster prevention measures in consultation with the responsible authorities;
- test the required emergency and disaster prevention measures;
- have the required financial provisions for cleaning up residual waste, for process risks, additional investments and for other measures of a precautionary nature;
- have adequate insurance cover;
- check all activities and correct reporting on a regular basis and initiate additional measures if required;
- report major events of environmental relevance immediately to the holding company.

REPORTING AND INFORMATION SYSTEM

Information on environmental management is available for all employees on the Intranet of the RWE Group under the title "Focus Umwelt". This includes all guidelines, the outline requirements on environmental protection and the environmental guidelines of all Group divisions.

In 1999, RWE set up an internal environmental reporting and information system (UBIS) to describe and verify the progress of environmental protection in the Group. It is tailored to the outline requirements on environmental protection and records information of the Group divisions on:

- organization of environmental protection,
- environmental programs with progress of implementation,
- data with respect to the materials and energy flows in line with input-output chart of accounts,
- environmental protection expenditure,
- certification and monitoring of the environmental management systems,
- incidents and accidents of environmental relevance.

UBIS thus also provides the information basis for communication with the public, especially for the preparation of the Group's environmental report published every two years.

RECORDING MATERIAL AND ENERGY FLOWS

The material and energy flows of environmental relevance are recorded in an input/output chart of accounts together with other UBIS content for any given year. Reporting date is December 31. This reporting period does not tally with the fiscal year of RWE, but is required in the environmental sector in order to discharge the public-law information duties.

The major data of the material and energy flows are not aggregated at Group level for two reasons. On the one hand, the reporting should be aligned above all with the business processes in order to connect the material and energy flows with the underlying activities. On the other hand, a straightforward addition is not possible due to the large number of the internal material flows. The balances have been delimited around the respective Group divisions so that internal material and energy flows are not reflected.

DEVELOPMENT AND PRESENTATION OF ENVIRONMENTAL INDICATORS

Indicators for the major environmental aspects have been selected for each Group division in order to improve the assessment of how environmental performance is developing. Since these are still mainly absolute indicators, they have been marked in the input-output tables of the respective Group divisions, while some of them have also been represented graphically.

So far, there are only few specific indicators representing consumptions or emissions by product because calculation requires differentiated data. They are graphically displayed in the data section of the Group divisions.

CERTIFICATION AND MONITORING OF THE ENVIRONMENTAL MANAGEMENT SYSTEMS

Owing to the wide range of business segments of the RWE Group and due to the large number of legally independent companies, it is up to the Group divisions to choose appropriate measures. In the Petroleum and Chemicals division, one plant has already been certified according to DIN EN ISO 14001, while the other plants are preparing for this. Three CONDEA plants have been validated according to EMAS. RWE Umwelt is focused on certification according to the Waste Management Firm Regulation, which is already complete in most of the companies. By the end of 1999, three locations of Heidelberger Druckmaschinen had already implemented EMAS, one of them DIN EN ISO 14001 at the same time. The companies of TESSAG are primarily relying on DIN EN ISO 14001 and are currently building up appropriate management systems. At HOCHTIEF, many facilities have obtained the SCC certificate (Safety Certificate Contractors), which stands for a verification of the health and safety standards and has been developed specifically for service providers.

Externally assessed locations in the RWE Group

	1998	1999
EMAS	5	6
ISO 14001	1	3
Waste management firm	80	79*
SCC	4	7

* One company left the consolidated group.

ENVIRONMENTAL PROTECTION EXPENDITURE

When recorded pursuant to the German Environmental Statistics Law, the management companies and the major subsidiaries and affiliates of RWE spent a total of 1.26 billion on environmental protection in fiscal 1998/99. The expenditure is made up as follows:

- Air pollution control: 41 percent
- Landscape protection: 30 percent
- Waste management: 15 percent
- Water pollution control: 13 percent
- Noise protection: 1 percent

WORKING GROUPS ON ENVIRONMENTAL ISSUES

Working groups are formed as and when required in order to address current developments, discuss their importance to the Group and to develop proposals for action. They do not only comprise employees of the holding company, but also of those Group divisions that have to do with the respective issues and problems. One example of this is the working group on "CO_2 and climate" of the RWE Group. Its tasks include the development of key elements for a CO_2 reduction strategy of the Group and the coordination of research and development activities for climate protection.

Sustainable development in the RWE Group: A continuous process.

RWE addressed the issue of sustainable development for the first time in the 1998 environmental report and put it under the heading of "socially and globally responsible action". We feel more committed than ever to this guiding principle.

Increasing requirements in terms of climate protection, resource efficiency as well as transparency of manufacturing processes and the need to respond to the demands of interest groups have become additional elements of competition. Future value growth of our Group therefore also depends on the right positioning with respect to environmental protection and social questions. These considerations equally apply to those divisions that no longer belong to the core of the restructured Group and will be managed as financial participations.

We have identified the following activities, services and products as having basic potential in a competitive environment: Efficient and innovative power generation, eco-intelligent products and services, closing the resource recovery cycles and development of new services. Involving and skilling our employees and the international transfer of know-how are from our angle as a responsible corporate Group additional preconditions for long-term corporate success. We have included these priorities in our Group guidelines. They provide the framework for the operating Group divisions and are designed to promote sustainable development there and in the holding company itself. The fact that the RWE Group was put on the Dow

Jones Sustainability Index in 1999, comprising the 200 largest companies worldwide managed in line with the principles of sustainable development, shows that we are on the right track. (> www.sustainability-index.com).

With the second environmental report of the RWE Group, we are presenting an updated systematic overview of environmental protection in the overall Group. We have taken particular care to describe the development of major environmental aspects. The economic and financial aspects of our activity are described in the Annual Report of the Group (> available from RWE AG). The annual Personnel Report of the RWE Group (> available from RWE AG) provides information on social aspects such as workforce structure and development, basic and further training, employee participation as well as industrial safety. We are not yet in a position to provide an integrated appraisal of the environmental, social and economic dimensions of our activities, in which relationships and interactions are studied and the impact of our activities on sustainable development is described in general. We have worked out a case study for each of our seven fields of action as a

ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Terms of reference			
▪ Development of general requirements for the environmental management systems of the Group companies.	6/1999	completed	
▪ Implementation of the general requirements in the Group companies.	6/2000	completed	
▪ Introduction of a Group-wide reporting system on the environmental aspects and the progress of environmental management.	6/1999	completed	EDP-assisted environmental reporting and information system (UBIS)
▪ Expansion of the exchange of experience on environmental management.	continuous		Transfer seminars on the subjects of environmental management and sustainability were conducted, environmental protection subjects covered on the RWE Intranet
▪ Updating environmental management in response to the changed Group structures	6/2001		including UBIS
▪ Updating external reporting in response to international standards (e.g. Global Reporting Initiative)	6/2002		
Development of environmental protection			
▪ Updating the measures for achieving the national and international environmental targets relevant to the RWE Group: – Climate protection, especially reduction of CO_2 emissions – Protection of the atmosphere – Soil and water pollution control – Nature conservation and landscape protection – Resource conservation and minimization	annually at Dec. 31		
▪ Structured inquiries on progress of implementation	as of 1/2001		
▪ Participation in national and international research projects on climate protection	continuous		> p. 17 "Scientific projects"
Implementation of sustainable development in business processes			
▪ Identifying major fields of action for sustainable economic management	3/1999	completed	
▪ Adding targets for sustainable economic management to the environmental guidelines	6/2000	completed	
▪ Concept for systematic integration of sustainable development into the business processes	12/2002		
▪ Improvement of recording and allocation of environmental protection costs	12/2001		
▪ Taking account of the entire lifecycle in the planning and design of our products and services	6/2002		
▪ Testing new instruments for global reduction of greenhouse gases (certificate trading, joint implementation, clean development mechanism)	12/2002		> p. 8/9 "Commitment to climate protection"
▪ Identification and evaluation of energy conservation potentials at plant level as well as in transport and logistics	6/2001		
▪ Improving efficiencies in power generation from lignite by introducing lignite-fired power plants with optimized technology (BoA)	6/2002		Power plant under construction
▪ Diversifying the power plant portfolio through – expansion into the cogeneration market – expansion of alternative energies	continuous		
▪ Testing deployment of fuel cells with downstream small-scale turbine	continuous		Prototype plant under construction > p. 48
▪ Expansion of innovative services for our customers such as – energy management – energy controlling, plant monitoring	continuous		"Fuell cell technology"

first step in this direction. The experience gathered during this process will be transferred step by step to the overall Group. We consider this to be the best approach to develop the awareness for sustainability in our Group. On this basis, we will develop a strategy as to how the guiding principle of sustainable development can be implemented in the Group.

Against the backdrop of the important environmental-policy goals of our Group, we want to develop sustainability criteria for the future by which we can measure our progress and systematically pursue our strategy. This project is included in the general program of the RWE Group.

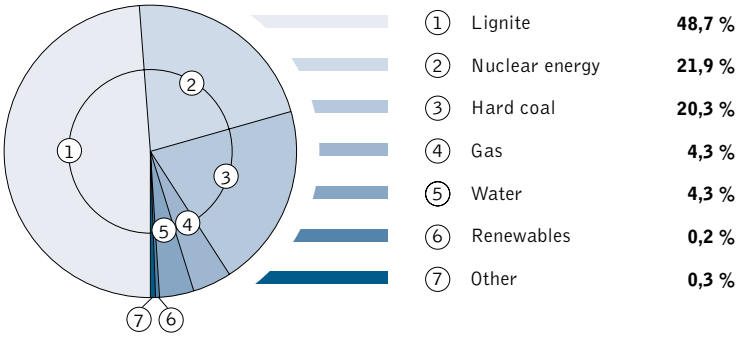
The status report on the environmental program of the RWE Group describes the achievements of the last two years. Worthy of being mentioned in particular is the establishment of a Group-wide environmental reporting and information system as well as the expansion of the internal exchange of experience on environmental management and sustainable development.

The Environmental Report shows that major headway has been made or at least crucial measures could be brought under way for the essential environmental-policy aims of climate protection, protection of the atmosphere, soil and water pollution control, nature conservation and landscape protection as well as resource conservation and waste minimization. In the future, we will have to focus increasingly on the environmental aspects of the entire lifecycle of our products apart from the production-related issues of environmental protection. To this end and with a view to improving our environmental performance further, all Group divisions have set themselves concrete aims and defined appropriate measures.

Development through innovation.

The Energy division of the Group supplies electricity, gas, water, district and process heat. The bulk of this is provided by RWE Energie AG. To this end, the company, which has a workforce of more than 17,000 employees, operates a number of power plants of various types, an extensive high-voltage grid as well as the associated electricity distribution facilities.

Contribution of different primary sources of energy to total electric power generation of RWE Energie in 1998/99



1	Lignite	**48,7 %**
2	Nuclear energy	**21,9 %**
3	Hard coal	**20,3 %**
4	Gas	**4,3 %**
5	Water	**4,3 %**
6	Renewables	**0,2 %**
7	Other	**0,3 %**

In the more recent past, the field of activities has been expanded by energy-related services. These include energy controlling for industrial customers as well as planning, construction and operation of heat and refrigeration plants. Moreover, RWE Energie has interests in various utilities. The three largest majority stakes in Germany are envia Energie Sachsen Brandenburg AG, Lech-Elektrizitätswerke AG and Main-Kraftwerke AG, which together employ approx. 6,000 staff. Detailed information on the electricity market and the energy policy in Germany is available on the Internet (> www.strom.de). Above and beyond this, RWE Energie has interests in utilities and is involved in projects abroad.

The operation of fossil-fired power plants (lignite, hard coal, gas and fuel oil), a refuse-incineration cogeneration plant and of nuclear power plants is of particular environmental relevance. The portfolio of power plant (owned and contractually-secured power plants) with a total capacity of some 26,000 megawatt (MW) also comprises a large number of hydroelectric stations, quite a lot of wind power and photovoltaic plants as well as

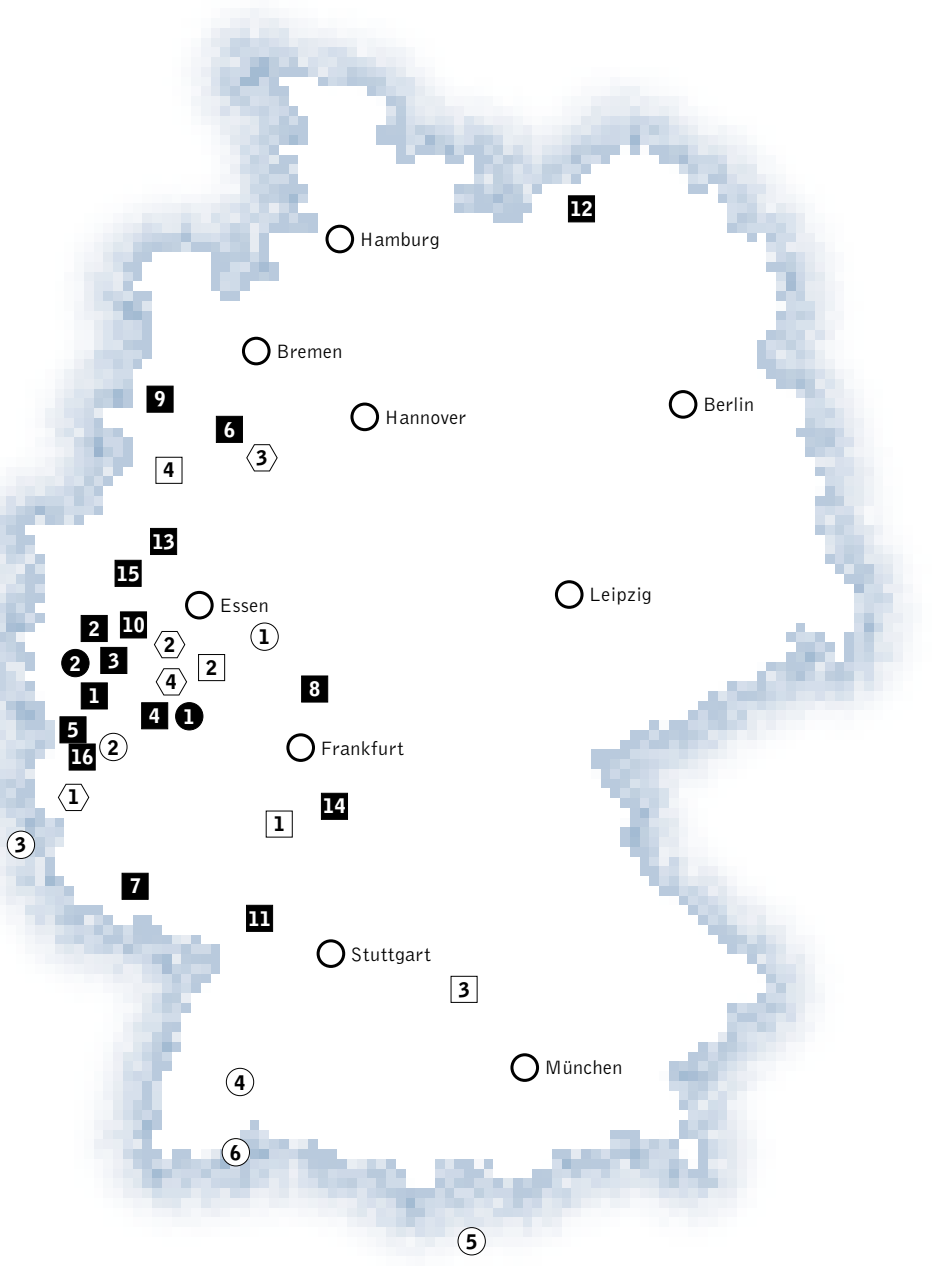
small-capacity hydroelectric plants, which have partly been funded with the revenues from the environmental tariff (> www.umweltplus.de). The company's plants of environmental relevance include the transmission and distribution systems for electricity, district heat, gas and water. Various licenses had to be obtained for the erection and operation of the plants: The nuclear power plants, for instance, are licensed under the Atomic Energy Act, all fossil-fired power plants and substations with a high voltage of more than 220 kilovolt under the Federal Pollution Control Act and the hydroelectric power plants under Water Management Law.

Major effects of electricity and heat generation on the environment are caused by emissions to the air, especially sulphur dioxide (SO_2), nitrogen oxides (NO_x), particulate, carbon dioxide (CO_2), water vapor, heat and noise. Apart from waste, additional aspects are water pollution, detrimental effects on landscape and nature through the consumption or the use of areas as well as the transport and storage of radioactive wastes. Moreover, electric and magnetic fields are generated by electrical facilities (> detailed information on the Internet at www.femu.rwth-aachen.de). The limits laid down in the Ordinance on Electromagnetic Fields (26. BImSchV) are complied with by all plants.

RWE Energie AG is a party to the voluntary commitment of the Association of the German Electricity Industry (VDEW) to cutting CO_2 emissions providing for a reduction of CO_2 emissions of the energy industry by some 12 percent by 2015. Lech-Elektrizitätswerke are a member of Umweltpakt Bayern (Environmental Pact Baveria) through the Association of the Bavarian Electricity Industry. Main-Kraftwerke are involved in Unweltallianz Hessen (Environmental Alliance Hesse), established in May 2000, via the Hessian regional group of VDEW.

ENVIRONMENTAL MANAGEMENT

The environmental guidelines of the RWE Group are a firm part of the corporate mission statement of RWE Energie. A comprehensive organization was adopted with the environmental protection guideline in August 1994 in order to involve all units and offices with functions of environmental relevance. This guideline was amended in March 2000 in response to changes in legal regulations



Net capacity in Megawatt (MW)

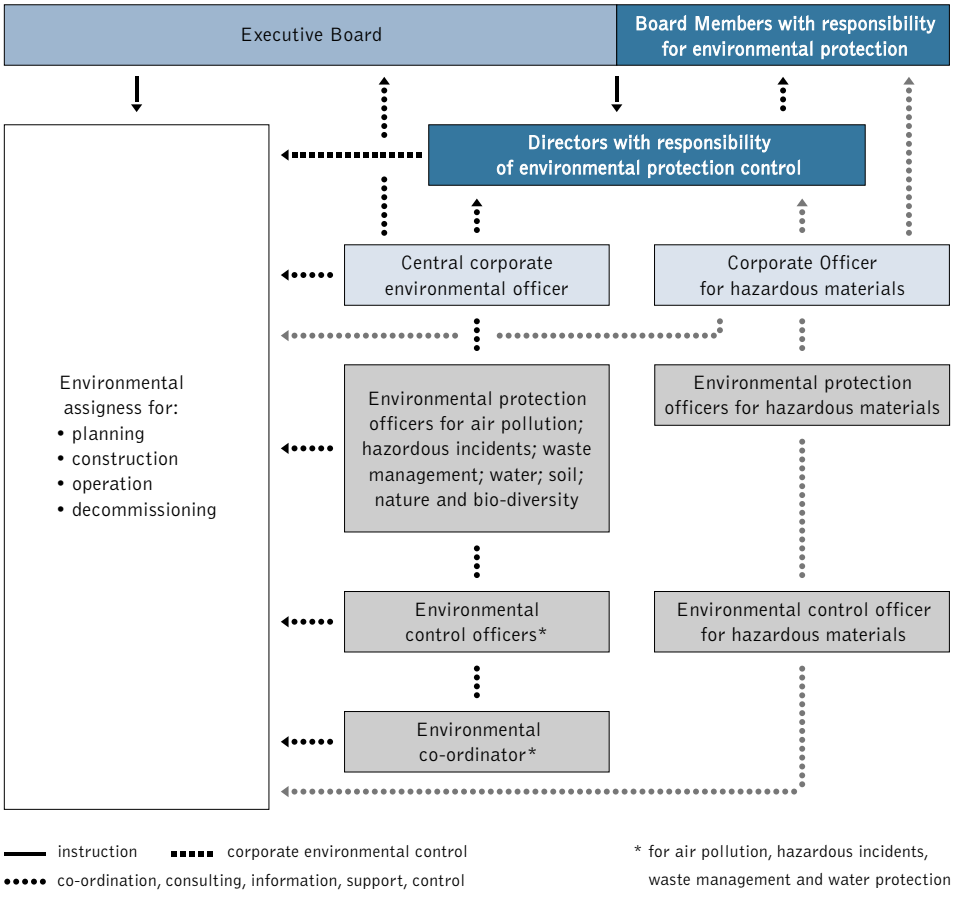
■	**Fossile fired power plants**	
1	Niederaußem	**2,650**
2	Frimmersdorf	**2,151**
3	Neurath	**2,106**
4	Goldenberg	**171**
5	Weisweiler	**2,093**
6	Ibbenbüren (76%)*	**709**
7	Ensdorf	**273**
8	Hoechst	**108**
9	Meppen	**610**
10	Huckingen	**580**
11	Ludwigshafen	**396**
12	Rostock (24.6%)*	**509**
13	Scholven (50%)*	**1,344**
14	Dettingen	**97**
15	Karnap	**37**
16	Weisweiler MHKW	**31**
17	Voerde (25%)*	**1,288**
□	**Nuclear power plants**	
1	Biblis	**2,407**
2	Mühlheim-Kärlich	**1,219**
3	Gundremmingen (75%)*	**2,572**
4	Emsland (12.5%)*	**1,290**
○	**Hydro-electric power plants**	
1	Plant Herdecke	**187**
2	Plant Bernkastel	**253**
3	SEO Vianden	**1,096**
4	Schluchseewerk (50%)*	**1,730**
5	Kaunertal (TIWAG)	**360**
6	Albbruck-Dogern (Radag/77%)*	**80**
●	**Wind power plants**	
1	Kirf	**1.50**
2	Grevenbroich	**0.60**
3	Stemwede	**1.60**
4	Sechtem	**0.60**
⬡	**Photo-voltaic power plants**	
1	Kobern-Gondorf	**0.34**
2	Neurather See	**0.36**
3	Small plants green tariff	**1.00**

*) share of RWE

and corporate structure. On the Executive Board, one member with special responsibility for environmental protection has been appointed for the power plants and the network sector, respectively.

Lech-Elektrizitätswerke, which intend to be certified according to DIN EN ISO 14001 in 2000, and Main-Kraftwerke have defined procedures and functions of operational environmental protection by organization handbooks. envia Energie Sachsen Brandenburg has adopted a regulation on organization. At RWE Energie AG, the operational organization is documented by the handbook for business centers and environmental protection (for the fossil-fired power plants and the plants generating power from renewable energies), by the organization handbook (for nuclear power plants) and the chapter "Environmental protection" of the construction site handbook. Detailed instructions have been adopted in the network sector on important environmental issues. Overall, some 120 environmental protection officers and coordinators are in charge of emission control and water pollution control, waste disposal, hazardous goods, accident prevention, radiation protection, nature conservation, landscape protection and soil pollution control at various locations of the company.

Since the experience and know-how of the largest possible number of employees is to be used, environmental protection is part of the in-house suggestion scheme not only at RWE Energie. Lech-Elektrizitätswerke and envia Energie Sachsen Brandenburg, too, award adequate bonuses to feasible ideas. At Main-Kraftwerke, extra points are scored for suggestions on environmental protection and industrial safety. All companies have set up working groups so as to ensure an exchange of experience between the environmental protection officers and coordinators. At RWE Energie, all persons principally concerned with environmental tasks in the head office assemble regularly for an "environmental protection meeting". An independent working group addresses the subjects of industrial safety, health and safety at work and environmental protection as well as radiation protection aspects for employees.



BASIC AND FURTHER TRAINING

Since environmental protection is not only a firm part of basic training, but also of further training, the following courses are organized by RWE Energie, in addition to those required by law:

- seminars on all environmental protection subjects as part of the company's training program;
- special seminars on current issues;
- routine meetings on environmental issues;
- training courses for field operators in power plants.

RISK MANAGEMENT

Provisions for risks at RWE Energie include a regular review of the structural and operational organization from an environmental perspective. Compliance with legal company-specific regulations is checked by way of audits. Other precautions are taken in the form of in-plant fire brigades, fire-fighting water retention systems, alarm and accident plans as well as the setting up of a crisis management team. Additional organizational requirements have been defined in the environmental protection handbook. All the hazardous materials used in plant operation are labeled in keeping with their potential risks and are documented in a database (ISUS) with instructions on how they have to be handled.

INDUSTRIAL SAFETY

The 1996 Industrial Safety Act has largely been implemented by RWE Energie, and a corresponding management system is currently being built up. The relevant basic organizational requirements have been laid down in the industrial safety guideline. Regular further training of executives and special courses are designed to keep employees up to date in terms of industrial safety and health and safety at work. The ratio of all notifiable accidents, including travel and sports accidents, was 29.9 accidents per 1,000 employees in 1998/99.

PURCHASING AND LOGISTICS

The employees in charge of purchasing consult with the engineers about using environmentally sound products so as to ensure that ecological criteria are already duly taken into account when making purchasing decisions. They can also base their decisions on the environmental purchasing guidelines defined in a specific handbook. When awarding contracts to suppliers and service providers, the environmental protection clauses in the contracts are of particular relevance. The general waste management conditions of RWE Energie apply to all waste management contracts.

In recent years, RWE Energie developed and tested water-based coating systems jointly with suppliers. In 1998, pylons of the first line section between Brauweiler and the Goldenberg power plant were painted with the new coating in order to test fitness for use, long-term behavior and corrosion resistance. In 1999, the first transformers with water-based corrosion protection coating were put into service.

Almost all power plants and large operational facilities have their own rail siding to ensure that shipments are as environmentally sound as possible.
The conveyor belts supplying the power plants with lignite and transporting the discharged ashes have been fitted with dust and noise-combating equipment. The plants' own vehicles also have to be as low-polluting and quiet as possible which requires regular maintenance and inspections.

ENVIRONMENTAL PROTECTION MEASURES

In recent years, RWE Energie has taken wide-ranging measures to reduce environmental pollution associated with electricity generation and to conserve natural resources.

Air pollution control: Flue-gas desulphurization systems have been installed on all coal-fired power plants to reduce sulphur dioxide emissions. On average, they are 90 percent lower today than in 1983. In the same period, nitrogen oxide emissions dropped by more than 70 percent through various measures. Detailed studies revealed in the last two years, that the use of adipic acid as additive helps to raise the efficiency of flue-gas desulphurization systems. A decision as to how this potential can be harnessed is to

On May 4, 2000, the Supervisory Boards of RWE and VEW resolved to merge the two companies. VEW's core business is energy generation accounting for 68 percent of total sales. Other business segments are grid gas, waste management and real estate. The company based in Dortmund was created by the merger of three Westphalian electricity utilities. Today, electricity generation is managed by the subsidiary VEW Energie AG with about 4,100 employees. The company owns five power plants, has interests in three power plants and operates 13 hydroelectric power plants. At an installed capacity of 6,454 MW, 60 percent of the company's electricity output is generated from hard coal. 26 percent are accounted for by nuclear energy and 6 percent by natural gas. Hydroelectric power and other energies contribute 8 percent. In 1996, VEW Energie adopted guidelines on environmental protection and created an environmental management system. In 1997, the company presented its first environmental report with data on material and energy flows and with specific environmental indicators. A follow-up report was published in 1999. VEW Energie's solar energy forum erected at Westfalenpark in Dortmund back in 1991 gives visitors the opportunity to familiarize themselves with renewable energies. The forum informs about scientific relationships, gives technical tips, information on energy conservation and practical application hints. More information on the company and the current environmental report as download is available on the Internet (> www.vew.de).

www.vew.de

be taken before the end of 2000. And finally, the last lignite-fired power plant was connected to the remote emission monitoring system of the authorities last year (> www.lua.nrw.de). Examples of contributions to air pollution control abroad are the backfitting of the Matra lignite-fired power plant in Hungary and the completion of the Plomin 2 coal-fired power plant in Croatia. The pollution control systems of these power plants are up to German standards.

Energy efficiency: The most effective way to cut CO_2 emissions , inevitably arising when fossil fuels are burnt, is to improve the efficiency of power plants. This is because the more electricity is generated by unit of primary energy used, the lower the specific CO_2 emissions and resource consumption. The optimization scheme (retrofit) completed in 1997 raised the average efficiency by more than one percentage point and cut annual CO_2 emissions arithmetically by some 2 million tons. RWE Energie is now taking another step by erecting a power plant of the next generation in Niederaußem. The lignite-fired unit with optimized technology (BoA) has an efficiency of more than 43 percent and will replace existing plants with efficiencies of some 31 percent (> "Brief description of Niederaußem power plant BoA-unit K" available from RWE Energie AG). A download is available on the Internet (> www.energielinks.de) with the title "Coal-fired power plants of the future – clean and efficient".

RWE Energie is supplying its customers with thermal energy in the form of district heat and process steam from existing and new power plants by way of cogeneration. Significantly lower emissions as a result of extremely high utilization of energy content can be achieved especially by replacing existing plants of customers by modern natural gas-fired units. The cooperation with Bayer AG at Dormagen is an example of successful cooperation in this sector. RWE Energie is currently

www.lua.nrw.de **www.energielinks.de**

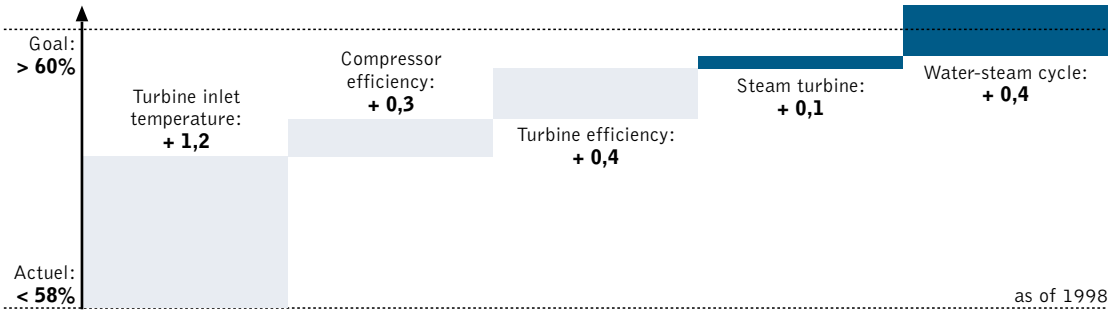
building a plant there with a capacity of 570 MW. Other examples are the CCGT projects at BASF's sites in Ludwigshafen, Antwerp (Belgium) and Tarragona (Spain). The 112 MW plant installed at Opel's Rüsselsheim works and the cogeneration station for the production facility of ŠKODA AUTO in the Czech Republic, which has been acknowledged by the authorities as a climate protection pilot project, are among those plants that have already gone into operation. The ŠKODA AUTO project alone cuts CO_2 emissions by 272,000 tons per year. This is a reduction of 34 percent compared with the previous plant.

Water pollution control: Detailed inspection programs were performed on all underground wastewater pipelines of the substations and power plants with a view to preventive water pollution control. The necessary remediation work is largely complete and will be finished in 2001. More than DM 50 million have so far been invested in measures on transformer stations of the distribution grid. This work centered on upgrading the equipment to contain failure-related oil leaks.

Nature conservation and landscape protection: Transmission routes and high-voltage lines are maintained on the basis of long-term maintenance plans. They define the nature, extent and timing of the measures optimized in ecological and economic terms. So far, such plans exist for about 30 percent of the forest-crossing transmission line routes; maintenance plans are to be drawn up for all such routes by 2004.

Waste reduction: The lime obtained from water treatment, for instance, serves as additive in flue-gas desulphurization systems, glass-making and as fertilizer in agriculture in order to minimize the volume of generated waste and to conserve resources by internal or external recycling. Ashes and slag from the hard coal-fired power plants are used as feedstocks in construction materials, those from the lignite-fired power plants are used for backfilling in depleted opencast mines. Almost 100 percent of the ashes are recycled. The gypsum obtained from flue-gas scrubbing is used as feedstock by building material manufacturers. Recycling outlets have been developed for a number of other wastes, while corresponding measures have been defined in the waste management schemes of the power plants and transmission systems.

Protection of birds: In the network sector, RWE Energie completed the program, launched in 1990, for the bird-friendly design of the medium-voltage system.



Potential for further net efficiency improvements of CCGT power plants.

Combined-cycle gas-turbine power plants (CCGT power plants for short) are among the technologies which are growing in importance in the competitive environment of the electricity markets also from an environmental perspective. They combine gas and steam turbines to improve efficiencies and are typically fired with natural gas. Particularly high efficiencies of up to 87 percent are achieved if the low-temperature steam is additionally harnessed by way of cogeneration. The operation of such plants can be particularly efficient if there is a largely constant demand for heat, as is the case in the chemical industry. RWE Energie has erected cogeneration plants for several customers in industry and supplies the process steam demand of such plants. The simultaneously generated electricity is either partly taken up and consumed by these plants themselves or they feed it into RWE's interconnected system. Conversely, any extra demand for electricity is met from the interconnected system.

37,000 kilometers of transmission line routes were inspected and some 8,000 pylons were modified. Overall, some DM 7 million have been invested to protect birds from being killed by electric shock. For the high-voltage lines, too, effective bird protection measures were developed under a research program.

COMMUNICATION

Detailed information is available on the Internet (> www.avanzastrom.de) about the Avanza Eco Power offering. The employees of RWE Energie are informed about environmental protection issues through the company magazine "Verbund", magazines at power plant sites and by other publications of individual plants. The power plants organize open-house days on a regular basis for the local residents in the neighborhood and offer guided tours.

Representatives of RWE Energie are members in numerous bodies of the industry, in the National Association of German Industry (BDI) and in the Association of German Chambers of Industry and Commerce to maintain the exchange on environmental issues across companies. With a view to continuously improving power plant technology, the company cooperates in research and development projects with plant manufacturers and research institutions. RWE Energie sponsors the construction of a new laboratory at Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen with more than DM 7 million in order to promote the development of power plant engineering by the scientific community. The institute aims, among other things, to improve energy conversion when using gas, oil and coal. Intensive cooperation has also developed in recent years with nature conservation and bird protection associations.

SOCIAL ASPECTS

The company offers its employees flexible working-hour schemes, part-time work and parental leave of up to four years so as to better reconcile work and family. The ratio of severely disabled employees of RWE Energie totaled about 4.4 percent in 1998/99, being slightly down from the year-earlier level. Overall, the company employed 818 severely disabled people in this period. More detailed information is available in the annual social reports of RWE Energie and envia Energie Sachsen Brandenburg (> Available from: RWE Energie AG, Corporate Communication).

The donations and sponsoring activities, too, demonstrate the company's social and ecological commitment: RWE Energie has been concentrating here on its commitment to classical music by sponsoring young artists and concerts in the region and abroad. In 1999, the company also supported an exhibition of the nature conservation associations of Bergisches Land on the subject of biodiversity; the Bavarian regional association for bird protection received a donation of Lech-Elektrizitätswerke. RWE Energie has been a long-time sponsor of the United Nation's Children's Fund (UNICEF).

In June 2000, the energy consensus talks, which had started in 1992 and were suspended several times, led to a compromise between the federal government and the energy utilities on the future use of nuclear energy in Germany. The residual power quantities which can be produced by the nuclear power plants until they are taken out of service, as well as agreements on the management and intermediate storage of depleted fuel assemblies are major elements of the agreement which is to be implemented by an amendment of the Atomic Energy Act. The consensus reached between the federal government and the energy utilities has created outline conditions enabling the nuclear power plants to be operated without any politically motivated disruptions in the future.

Power volumes have been defined for the individual plants, which can be produced until they have to be taken out of service. These power volumes can basically be transferred from one power plant to another which gives the companies the necessary flexibility for profitable use of the power plants. The agreed power volume is 2,623.30 terrawatthours for all German nuclear power plants taken together, including RWE's Mülheim-Kärlich power plant. This is equivalent to a calculated lifetime of 32 years at high utilization. In return for abandoning the recommissioning of the Mülheim-Kärlich nuclear power plant, RWE receives a quota of 107.25 terrawatthours which can be transferred to other plants of the Group. No deadline has been fixed as to when individual plants have to be shut down.

Now that reprocessing of fuel assemblies is politically no longer desired and limited until July 1, 2005, and given the fact that the number of shipments of depleted fuel assemblies to the French and British reprocessing plants as well as the central intermediate repositories at Ahaus and Gorleben are to be reduced, the operators have undertaken to set up decentralized intermediate repositories for the depleted fuel assemblies at all nuclear power plant sites. Since the German energy utilities have to spend some DM 780 million on these repositories, this solution involves major economic disadvantages. However, the power plant operators accept these drawbacks to enable the disposal of waste from nuclear power plants to be resumed quickly and to safeguard the continued operation and hence the jobs at the power plant sites. RWE has applied for licenses for decentralized intermediate repositories with the Federal Office of Radiation Protection for its Biblis and Gundremmingen sites. Another point of the consensus reached relates to the ultimate disposal of nuclear fuel assemblies. Exploration of the Gorleben salt dome, so far planned as ultimate repository, will be suspended for at least three and a maximum of ten years. The geological findings obtained so far have confirmed the basic suitability of the salt dome, also in the opinion of the federal government. The ultimate repository project will therefore not be given up. It is planned, however, to clarify questions related to the safety concept, including the examination of other host rock, during the agreed moratorium.

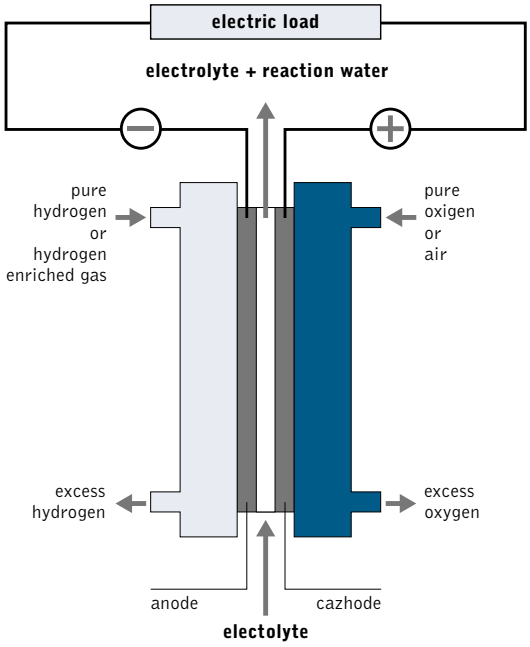
Field of action: Development of the energy industry

Goal: Decentralized energy supply by fuel cells with high efficiencies is aimed at as building block for forward-looking electricity and heat supply. The simultaneous expansion of energy-related services in the area of energy management is designed to contribute to safeguarding the long-term future of the company.

Trigger: The demand to limit the service lives of nuclear power plants in Germany has gradually taken hold in the public and political debate. This goes hand in hand with increasing financial support for electricity and heat generation by small-scale plants, especially from renewable energies. Investments are required in ecologically beneficial and decentralized technology such as CCGT plants and electricity and heat generation from renewable energies in order to continue strengthening Germany as a place to do business through its research and development lead and to safeguard jobs in the energy industry for the future. In this context, the development of fuel cells is an important element.

The projekt: Basically, the fuel cell is a rechargeable battery in which oxygen and hydrogen react via an electrolyte membrane and in which electrical energy is generated directly by this process. The required hydrogen is obtained from natural gas. Moreover, the reaction heat can be tapped and the off-gas of a pressurized system can be used for electricity generation and subsequently for heating purposes by way of a downstream turbine. All in all, this results in a potential electrical efficiency of more than 65 percent. In mid-1990, RWE Energie AG decided, in its capacity as lead manager of an international consortium, jointly with Siemens/Westinghouse to build a fuel cell demonstration plant in North Rhine-Westphalia. The plant of the SOFC type (solid oxide fuel cell) operates under pressure and has an electrical capacity of 320 kW with an efficiency of 58 percent in combination with a gas turbine. The plant, which is unique in Europe, is being erected on the site of RWE's "Meteorit" park with the involvement of suppliers from North Rhine-Westphalia and is due to come on stream in the first quarter of 2002. The plant is designed for a service life of four years.

Fuel cell



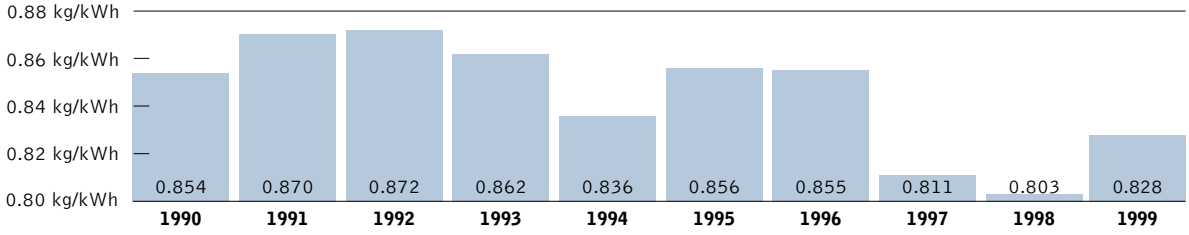
Benefit for sustainable development: Benefit for sustainable development: Fuel cells enable also small-scale plants to generate electricity and heat at high efficiencies, which leads to conservation of finite resources and reduces CO_2 emissions. Virtually no pollutants, such as nitrogen oxides and sulphur oxides are caused. Another advantage is that the fuels cells work at low noise levels and require almost no maintenance. The cogeneration market can be expanded because the fuel cell technology is also suitable for customers with high electricity and low heat consumption. Unlike block-central cogeneration plants, this technology enables a constant efficiency to be achieved even at part-load operation.

	Unit	Fiscal year			Calendar year	
		1994/95	1995/96	1996/97	1998	1999
INPUT						
Energy						
Lignite	t	86,313,630	86,073,637	88,316,995	85,280,251	80,738,085
Hard coal	t	1,269,051	1,322,892	1,132,927	998,838	1,156,200
Nuclear fuels	t	116	62	139	69	104
Oil	t	23,531	19,757	18,163	28,855	31,637
Natural gas	1,000 m^3	638,000	680,000	639,000	1,061,648	1,008,915
Other gas	1,000 m^3	3,366,000	3,067,000	3,228,000	3,004,541	3,221,797
Motor fuels	1,000 l	4,510	4,262	3,446	3,750	3,836
Wastes	t	651,674	50,754	655,171	641,491	651,598
Water	1,000 m^3	3,634,726	2,062,579	4,114,979	4,012,652	3,874,117
Raw materials and consumables						
Natural gas*	1,000 m^3	646,000	756,000	758,000	763,000	975,059
Electricity (purchased)*	MWh	30,267,708	29,561,150	22,786,043	28,616,000	46,291,424
Lime	t	570,384	507,311	505,256	568,782	405,503
SF_6 (sulphurhexafluoride)	t				1	1
OUTPUT						
Products						
Electricity*	MWh	125,582,254	124,308,075	129,747,122	139,815,000	157,843,169
District heat*	MWh	1,506,000	2,914,000	4,442,000	6,237,000	8,146,245
Natural gas*	1,000 m^3	646,000	756,000	758,000	736,000	975,059
Water*	1,000 m^3	35,132	37,913	36,835	26,657	27,290
Gypsum	t				933.285	789.146
Lime fertilizer	t	57,699	57,411	50,803	58,765	56,782
Emissions						
CO_2	t	88,583,020	91,050,925	90,177,363	89,180,000	88,262,728
CO	t	32,442	29,291	28,109	30,216	29,404
SO_2	t	34,624	29,219	31,038	30,471	22,997
NO_x	t	58,553	51,787	51,392	59,882	57,354
Particulate	t	1,622	1,646	1,643	1,654	1,642
Heavy metals	t	6.2	5.6	5.5	6.0	6.0
Wastes						
For recycling	t	6,568,785	6,232,263	6,448,436	4,412,574	3,561,215
gypsum for recycling	t	1,220,021	1,095,018	1,059,284	258,061	110,822
ash for recycling	t	5,177,855	5,013,764	5,293,020	4,047,312	3,372,513
of which in need of particular monitoring	t				2,541	6,204
For disposal	t	37,776	48,447	32,193	31,592	45,126
of which in need of particular monitoring	t				5,109	5,572
Depleted nuclear fuels	t	97	76	54	39	0
Radioactive operating waste **	t	367	310	175	357	312
Waste water	1,000 m^3	70,949	66,248	62,789	56,512	58,896
Waste water load COD	t O_2	1,073	1,005	941	986	1,027
Cooling water to drainage ditch ***	1,000 m^3	3,365,411	1,787,346	3,846,506	3,742,019	3,645,385
Water losses cooling towers	1,000 m^3	159,686	167,939	172,738	176,193	167,068

* The data for 1998 and 1999, too relate to the fiscal year ** untreated *** 1995/96 outage NPP Biblis unit A

Commentary With respect to the data presented for the produced amounts of gypsum, account has to be taken of the fact that the gypsum generated in the lignite-fired power plants has been classified as a product since 1997/98. The strong decline of the gypsum volume, the use of limestone and the SO_2 emissions for 1998/99 is primarily the result of lower sulphur concentrations in the run-of-mine lignite. Depleted fuel assemblies reflect the fact that shipments have been banned since May 1998. The major changes of input and output values for electricity, gas and district heat in 1998/99 are due to the inclusion of the three largest majority shareholdings.

Specific CO_2 emissions



ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Reduction of waste volume			
▪ Increased recycling rate of unavoidable wastes, e.g. by collection and provision in suitable form.	step by step	12/2001	Waste management optimization study in the lignite-fired power plants complete.
▪ Increased recycling of soil excavation and demolition material, especially by separation and treatment.	step by step	Guide planned to be drawn up.	
▪ Recycling of several 100,000 tons of lignite fly ash in the construction and building material sector per year.	by 2003	No further recycling.	Owing to declining ash volumes.
Reduction of emissions			
▪ Area-wide introduction of water-based paint systems for steel structures (overhead line pylons, transformers, steel structures).	by 2003	Large-scale test under way.	
▪ Exclusive use of chrome-free profilated fire bricks and ramming mass for refractory linings (e.g. renewal of boiler brick linings).	1998	Complete	
▪ Procurement of transformers and circuit breakers of quietest possible design to reduce noise emissions of switchgear and substations.		Replacement of existing plants if required.	
▪ Use of adipic acid to increase the efficiency of flue-gas desulphurization systems in some plants.	2000	Operating test being conducted.	
Soil and groundwater pollution control			
▪ Use of environmentally sound working substances and materials; examination of feedstocks for replacement and standardization potential; definition of a substitution and savings program.	bis 2000/1	Work is largely complete.	
▪ Development and introduction of organizational measures and training courses on preventive soil protection.	by 1999/ 2000	Training has been conducted.	
▪ Gradual upgrading of the collectors of additional distribution substations for protection against oil leaks.	by 2010	On schedule	
▪ Development of a cadastre of areas suspected of being contaminated with residual pollution.	by 2000/1	On schedule	
▪ Reassessment of cleaned-up residual pollution on the basis of the requirements of the new soil protection law.	by 2000/1	Being developed	
Improvement of the environmental management system			
▪ Introduction of a uniform environmental protection handbook for the network sector, completion of the system of outline instructions.	by 2000/1	Environmental protection handbook being prepared.	Instructions are complete.
▪ Filling of gaps in the environmental reporting system.	by 2000	Complete	By UBIS.
▪ Expansion of the environmental reporting system to include major affiliated companies.	by 1999/ 2000	Coverage of 91 percent achieved.	Inclusion of 3 subsidiaries.
▪ Expansion of basic and further training, improvement of training materials and methods.	by 2001	In-house training courses performed.	In the hazardous goods area expanded to other responsible persons.
▪ Establishment of the DP system "Goods, substances and materials in need of being monitored" (ISUS).	by 2000	Complete for waste and hazardous substances, as of mid-2000 also for hazardous goods.	

ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Development of the energy industry			
▪ Erection of the first 950 MW lignite-fired unit with optimized plant technology (BoA), reducing CO_2 emissions by 2.5 million tons annually.	2002/3	On schedule; cooling tower built.	Existing lignite-fired units will be decommissioned.
▪ Replacement of all existing lignite-fired units by new optimized plants, reducing specific CO_2 emissions by approx. 27 percent.	by 2030		
▪ Improving the efficiency of power generation from lignite by 5 percentage points by testing lignite drying methods and developing dry-coal firing systems to commercial maturity, thereby reducing CO_2 emissions.	2000	Postponed to 2001.	Trial operation in demonstration plant.
▪ Testing of new materials and technologies to achieve higher boiler efficiencies.	by 2003	Project Comet on schedule.	
▪ Testing of fuel cells for decentralized cogeneration applications based on natural gas.	by 2010	Demonstration plant is being erected.	
▪ Development and testing of wind power plant technology.	continuous	6 plants erected.	Erection of demonstration plants.
▪ Development and testing of photovoltaic components.	continuous	Pilot plants at Kobern-Gondorf and Lake Neurath.	Addition and testing of latest technologies.
▪ Erection of plants (photovoltaic, wind and water power) under the eco-tariff scheme.	continuous	Plants with an installed capacity of 3.2 million kilowatthours annually.	Through participation of 15,000 customers in the environmental tarif.
▪ Improving efficiencies of 10 hydroelectric power plants by upgrading instrumentation and control systems.	by 12/2003	20 percent	Capital expenditure: DM 45 million.
Reduction of resource consumption			
▪ Use of nuclear fuel with higher enrichment, optimization of core-loading strategies and mode of operation.	from 2002	License for use of enriched fuel assemblies granted for Gundremmingen.	
▪ Introduction of an EDP-assisted transport and vehicle deployment planning in the network sector to reduce fuel consumption and emissions.	by 2002	"Plantour" software being implemented.	
▪ Reduction of drinking water consumption in network operations by 5 percent through increased utilization of rainwater and groundwater for sprinkling and sanitation.	by 2000	Will not be implemented.	
▪ Local seepage of rainwater and covering roof surfaces with greenery.	by 2003/4	Some new plant buildings are being given roofs covered with greenery instead of air conditioning.	
Landscape protection and nature conservation			
▪ Drawing up cultivation and maintenance plans (definition of nature, extent and timing of cultivation and maintenance measures) and implementation all over the high-voltage system.	by 2002/3	Being implemented, but has to be stretched by approx. 2 years for cost reasons.	
▪ Fitting high-voltage transmission lines with bird-warning marks in exposed bird areas.	by 2003/4	Effective marks have been developed.	Estimated expenditure approx. DM 5 million.
▪ Introduction of bird-friendly structural designs in the medium-voltage transmission line system.	by 1999/ 2000	Complete; To be continued with new structures	Capital expenditure of DM 7 million.

Responsibility for the environment.

The Mining and Raw Materials division comprises affiliates inside and outside Germany. The core business is the extraction and upgrading of lignite. Most of this is handled by the market leaders Rheinbraun AG and Lausitzer Braunkohle AG (LAUBAG).

About one quarter of the electricity consumed in Germany is generated on the basis of lignite from the Rhineland and Lusatia (Lausitz). Every year, the Rhenish opencast mines supply 95 to 100 million t (mt), and the mines in Lusatia just under 50 mt. (> An overview of current lignite-based power generation can be found in the brochure "Lignite in Europe", which may be ordered from Rheinbraun). Together, the two companies have a staff of some 17,000.

Rheinbraun's and LAUBAG's remit is not confined to the extraction of coal and associated mineral raw materials like gravel and clay occurring in the opencast mines, but also includes upgrading of some of the lignite to make pulverized lignite, briquettes and fluidized bed lignite, and the treatment of groundwater to make drinking and service water. In addition, Rheinbraun produces lignite coke and operates lignite-fired power plants that generate power and steam for the upgrading operations. To recover the post-mine landscape, both companies are engaged in recultivation schemes that have earned international recognition as well. Before safe mining operations are possible, groundwater must be withdrawn. Environmentally sound treatment and use of the water are assured.

The most relevant activities in environmental terms are the mining of lignite, its upgrading in briquette factories, and its combustion in power plants. The main sources of environmental impact in mining operations are the temporary landtake, the pumping and extraction of groundwater, and the generation of dust and noise. The use of lignite in mine-mouth power plants leads to emissions of sulfur dioxide (SO_2), nitric oxides (NO_x), carbon dioxide (CO_2) and particulates. Ash is produced by the combustion process.

In the various operating units, all equipment is approved in the operating plans required by mining law, and 21 units under the Federal Pollution Control Act (BImSchG) as well.

ENVRIONMENTAL MANAGEMENT

Operations at all firms belonging to the Mining and Raw Materials division are subject to RWE AG environmental guidelines. To supplement these, both Rheinbraun and LAUBAG have their own mining guidelines in place for the protection of the environment. At Rheinbraun, the workforce has access to these via the intranet.

Rheinbraun environmental guidelines

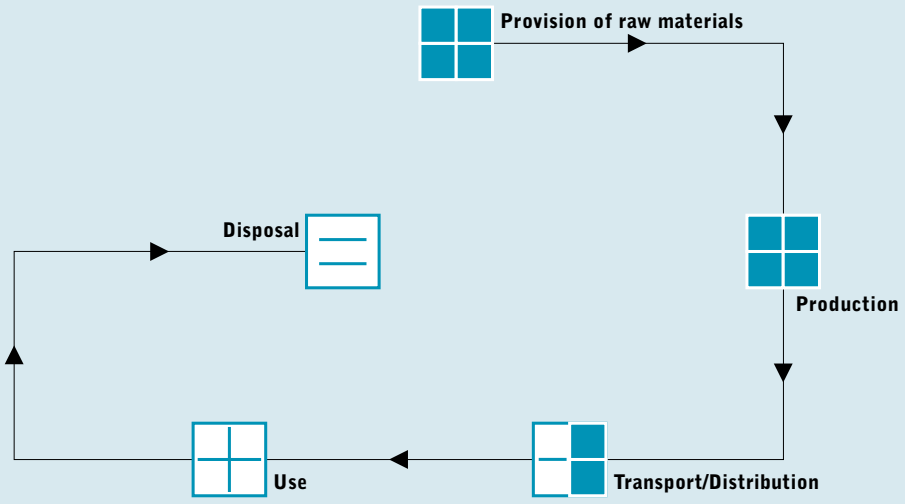
1. We make careful and responsible use of natural resources.

2. We are continuously developing our plant and processes within the bounds of what is economically feasible with the goal of minimizing energy consumption, raw material inputs, emissions and waste quantities. For us, environmental protection is more than just meeting statutory requirements.

3. We place the heaviest demands on the efforts made to restore and reuse the land affected by mining operations. In particular, we are pressing ahead with the steady further development of our recultivation standards – also in ecological terms – which are recognized the world over.

4. We oblige our employees to adopt an environmentally compatible approach. In all plants, we have clear organizational structures in place for effective environmental protection, and our employees' knowledge is updated by pinpointed vocational and further training measures.

5. We inform the general public and our employees of current environmental concerns. We seek and maintain an active and frank dialog on environmental issues with public authorities, neighbors and other interest groups in society with a view to finding effective consensus-based solutions.



very high relevance | high relevance | medium relevance | low relevance | no relevance | not applicable

Provision of raw materials Lignite mining always involves an invasion of the earth's surface and the water economy. These effects are offset by shaping an appropriate post-mine landscape and by stabilizing groundwater conditions in the wetlands.

Production Lignite combustion involves emissions of CO_2 as well as atmospheric pollutants. Cooling water is required. Combustion measures and increases in power plant efficiency are steadily reducing the emissions. Sulfur is almost completed filtered out by flue gas scrubbing. The gypsum emerging as a by-product is used as secondary raw material, while power plant ash goes to fill depleted mines.

Transport/Distribution Power installations occupy land and impair landscape and bio-systems. Their operation produces electric and magnetic fields.

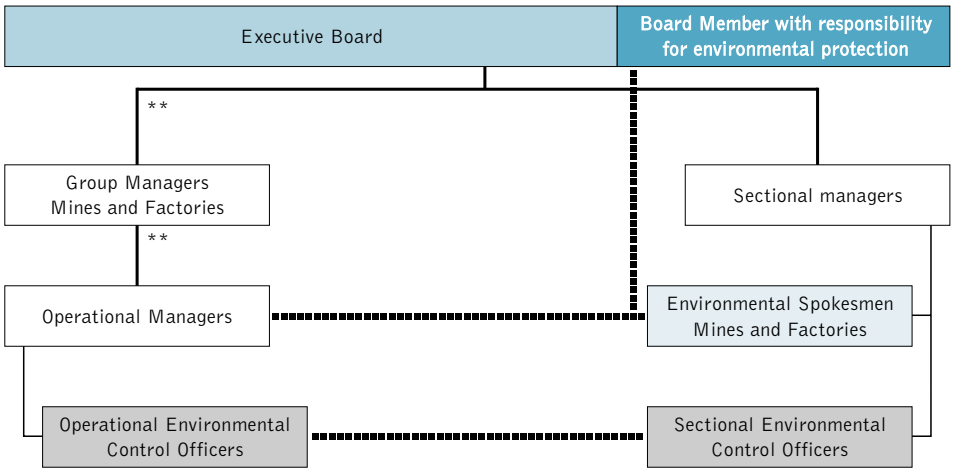
Use No environmental impact is associated with the consumption of electricity.

Disposal Electricity requires no waste disposal.

Key environmental goals and measures are set forth in the officially approved lignite plans for the open-cast mines and are given concrete form in our master and main operating plans, in approval procedures under water law and in landscape and conservation approvals as well. For their implementation, we have drawn up investment and operation project programs which are checked and updated on an annual basis.

One special feature of mining companies is the closed chain of responsibility required by mining law, with duties being defined all the way from the Executive Board to the people on the spot. The organization of this responsibility also considers the needs of environmental protection and safety at all levels. Those in charge at each level are supported and monitored by environmental control officers. Altogether, Rheinbraun and LAUBAG have over

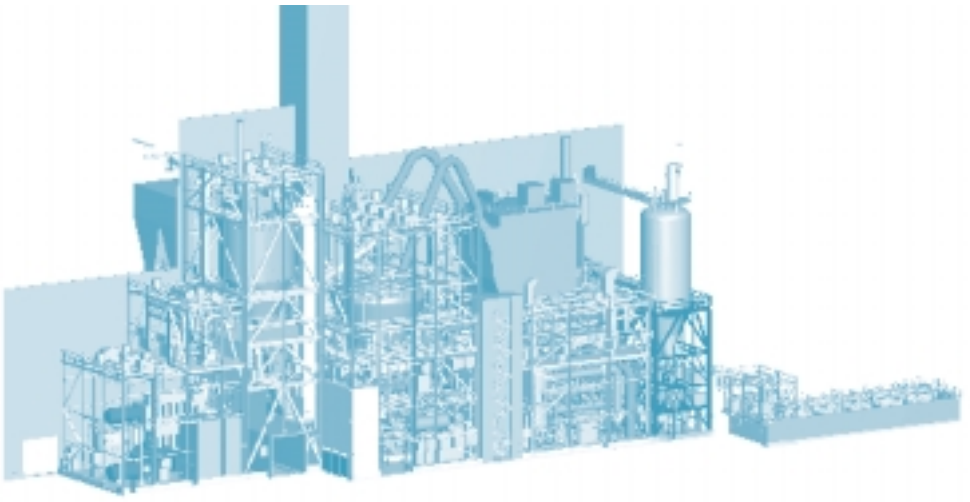
ENVIRONMENTAL PROTECTION ORGANIZATION OF RHEINBRAUN AG*



100 officers responsible for waterway protection, pollution control, incidents, plant safety, hazardous materials, waste, radiation protection and recultivation. In view of the importance of environmental protection, Rheinbraun has named one environmental spokesman each for the mining and factory fields to centralize the external representation of the Company. With a view to ensuring that the needs of the environment are considered in day-to-day work, procedural and working instructions have been drawn up for those production stages that are of relevance for the environment. These include the powering up and down of upgrading plants, the operation of sprinkler equipment to reduce dust nuisance in the open-cast mines and adherence to the admissible levels of power plant emissions. To obtain a further improvement in the information given to employees at all management levels about responsibilities, operations and structures in corporate environmental protection, Rheinbraun has drawn up an environment manual for all operating areas. This manual is based on the international environmental management standard DIN EN ISO 14001 and may also be consulted via the intranet. At LAUBAG, an environmental manual is currently being produced. Topical environmental issues are discussed and cross-divisional experience exchanged in various committees and working circles. In the company suggestion scheme, environmental protection is one criterion in the assessment of the contributions received.

RISK MANAGEMENT AND INDUSTRIAL SAFETY

For all business units, risk analyses have been drawn up for industrial safety and health protection, and the findings recorded in a safety and health protection document along with the resulting safety arrangements and protective measures. Alarm and risk-avoidance plans ensure that all members of the workforce act in a systematic and purposive manner in the case of any operating incidents or accidents in order to avert danger for people and the environment. All hazardous materials employed are marked to indicate their risk potential and are subject to strict controls. A Rheinbraun information system for hazardous materials (RING) has been set up, where all hazardous substances can be researched with operating instructions, safety data sheet and other product information and according to various criteria. Officers, specialist departments and staff units maintain a regular check on whether statutory provisions are being observed. At Rheinbraun, new rules are recorded and announced via the circular "Implementing new regulations on environmental protection and industrial safety". With a view to improving industrial



Pilot drying system at the Niederaußem power plant

As part of a research program to optimize lignite power plant technology, Rheinbraun is examining lignite predrying. This process, in which lignite is dried in an energetically favorable way at low temperatures and the energy content of the expelled water is exploited, is a further development of lignite-fired power plants with optimized plant engineering (BoA), to make BoA-Plus plants. A six-year R&D program worth some DM 230 million is investigating, inter alia, the use of this technology developed by Rheinbraun. The centerpiece is the pilot drying system at the Niederaußem power plant, which can be used to test both fluidized bed drying and mechanical-thermal dewatering in combination with a power plant (BoA-Plus). (> p. 43 "RWE Energie")

safety, Rheinbraun and LAUBAG have set up special programs. In 1999, the number of notifiable accidents was 182, equivalent to 6.6 accidents per 1 million hours worked. This total shows a marked decline relative to 1998.

PURCHASING AND LOGISTICS

To help spare resources, the companies make sure that, wherever possible, the materials procured are capable of recycling. LAUBAG, for example, has compiled purchasing guidelines and checklists in a manual covering the procurement of goods and choice of suppliers, identifying ecological requirements and environmental efforts as award criteria. Another example of the detail of environmental protection in action is the work done at Rheinbraun on vehicles powered by rape oil.

To reduce packaging outlays, Rheinbraun and LAUBAG lay stress on using returnable pallets and containers. Industrial customers are supplied on "packaging-free" terms from silo vehicles for pulverized lignite and fluidized bed lignite, with preference being given to rail transportation. Transportation from the mine to the upgrading facilities and power plants operated by RWE Energie AG or VEAG is entirely by rail or conveyor system.

PROCESSES AND PRODUCTS

All effects on the environment associated with the extraction of lignite, e.g. dust, noise, earth movements, changes in flora and fauna, are recorded. The counter-measures taken in the opencast mines are varied and include planning, technical and organizational arrangements. Priority goes to the activities that avoid or reduce emissions right at source. These include sprinkling, interim greening or other covering of any surfaces that are left exposed for longer periods, the spraying of bucket wheels, belt transfer points and bunkers to combat dust. The steps taken in noise abatement include the use of insulated equipment, drives or idlers and the encasing of sections of equipment. Among the innovative measures adopted in the past two years is the further development of measuring techniques that detect faulty idlers and replace these to help reduce noise. These efforts are effectively supplemented by downstream measures like embankment construction or planting schemes. Upgrading facilities are being continuously improved, for example, by filter systems or sound insulation, so that specific environmental impact has been falling for years. All coal-containing waste water from the upgrading plants is treated, and the cleaned water returned to the closed cycle. For its part, the coal substance recovered in the process goes to the power plants for combustion. At LAUBAG, too, coal-containing waste water from the briquette factory is treated to recover coal substance and convert this into energy.

At the mine-mouth power plants, which input lignite to generate energy for the upgrading facilities, high efficiency rates – meaning energy yield – of 85 % helps spare resources. This is achieved thanks to the cogeneration principle. Also, the mine-mouth power plants employ the modern, efficient and environmentally friendly technology of circulating fluidized bed combustion, which meets the emission guidelines without downstream flue gas scrubbing. At the Berrenrath power plant, sewage sludge has been thermally recycled since 1994. Following a comprehensive trial phase, which included the development of a low-cost and efficient flue gas cleaning process, cocombustion now operates with an annual capacity of some 130,000 t. Also, industrial-scale trials have been held since 1998 on the recycling of waste wood for energy. The use of these renewable fuels helps save fossil fuels.

The Garzweiler opencast mine operated in the north of the mining area will reach the western mine boundary in about the year 2006 and is then scheduled to pass on without a break into the Garzweiler II field. A comprehensive environmental compatibility study carried out in the lignite mining plan procedure demonstrated that this project is justifiable in ecological terms. All court actions brought against the mining plan have been dismissed in the meantime. At year's end 1997, the Düren mining office approved the master operating plan, i.e. the key mining approval for Garzweiler II. Following in-depth examination of hydrological and ecological issues in particular, the permission required under water law for dewatering, i.e. for draining the mine area, was issued in the fall of 1998. In the course of the procedure, investigations were carried out for the first time in an opencast mine project of this size to ensure compatibility with the European Flora-Fauna-Habitat Directive (FFH). In spite of the wide-ranging lowering of groundwater levels in the mine area, any impact must be prevented or restricted on wetlands worthy of protection and dependent on groundwater in the Maas-Schwalm-Nette conservation area located in the north. To preserve the wetlands, extensive percolation measures will be taken to protect large areas identified as bird sanctuaries and numerous sections identified as FFH areas.

Within the scope of the procedures launched under water legislation in the fall of 1999 for the percolation measures, figures were also drawn up for an FFH compatibility check covering a total of 29 FFH and bird sanctuary areas with over 10,000 hectares. It was shown in detail that groundwater levels can be maintained and that no significant impairment is caused by percolation water or by the construction and operation of plants and pipelines.

Further information on Garzweiler II is available from the Internet (> www.rheinbraun.de).

www.rheinbraun.de

Intelligent control technologies for SO_2 emissions at the Berrenrath and Wachtberg mine-mouth power plants have led to much lower lime consumption and, hence, to a reduction in ash. Moreover, waste management concepts in all operating units ensure that unavoidable waste is collected separately and then preferably recycled or else harmlessly disposed of. Mine waste like bricks, earth and stone as well as the ash occurring in the power plants are used to refill worked-out sections of the mine. Valuable materials like scrap steel are recycled by external firms.

To ensure that the sold products can be used with low emissions, only coal low in sulfur and ash is upgraded. To this end, LAUBAG and Rheinbraun have set up a quality management system.

COMMUNICATION

Employing an inclusive approach to the workforce, Rheinbraun and LAUBAG report on environmental themes and measures in their staff magazines and internal newsletters. Information for customers is contained in environment and product brochures or takes the form of advisory talks, e.g. in connection with the return of lignite ash. To give the general public an insight into our environment activities, the operating units and the Schloss Paffendorf information center extend invitations to plant visits and open days. Every year, up to 100,000 guests visit the facilities of the Rhenish lignite industry.

Methane is an important greenhouse gas that occurs, inter alia, in underground hard coal mining and due to leaks in the pumping and transportation of natural gas. The impact of methane on the climate is 21 times greater than that of CO_2. This being so, reductions in methane emissions in hard coal mining by drainage and subsequent use make an important contribution toward lowering greenhouse gas emissions and, hence, toward protecting the climate. Since 1991, Rheinbraun's subsidiary Consol Energy Inc., Wilmington, DE, USA, has been making increasing use of mine gas from Consol's own and from other mines operated jointly with partners mainly in the central Appalachians. This gas had previously escaped into the atmosphere. The mine gas is systematically captured in all phases of coal extraction and passed on via gas-collecting pipes and compressor stations to American users of natural gas. Compared with 1990, some 1 billion cbm of methane a year are now collected and used. This is equivalent to avoiding some 40 million t of CO_2 annually.

Continual improvements in environmental protection are also the subject of close collaboration with experts, colleges and universities, institutes and associations. The issues concerned include the development of energy-saving drying processes, the recultivation of opencast mines and the post-mine landscape or measures for reducing dump acidification. Representatives of Rheinbraun and LAUBAG also cooperate in various bodies working in this sector and in many public and municipal committees.

SOCIAL ASPECTS

In order to help employees reconcile the needs of family and work, Rheinbraun and LAUBAG offer part-time employment options. Rheinbraun also offers temporary release for parents to allow them to look after children or care for sick dependents. The employment rate for the seriously handicapped in 1999 was 6.8 % at Rheinbraun and 4.8 % at LAUBAG. Both firms keep their workforces and the public informed by publishing a social report. The Rheinbraun report is available for download from the Internet (> www.rheinbraun.de). LAUBAG, too, offers information on employee benefits (> www.laubag.de). In order to create future-oriented conditions in the region, Rheinbraun has joined other firms in a scheme to revamp the Hürth-Knappsack industrial site into a technology and new business center.

Field of action: Discharging social responsibilities

Goal: On the basis of early in-depth citizen participation, Rheinbraun offers its support in resettling organically grown village communities with a view to preserving their social structures, neighborhoods and communal and club life. Information passed on close to the ground helps those affected to appreciate, shape and, hence, accept resettlement processes..

Trigger: The economic benefits of lignite mining in ensuring the energy supply and in creating or preserving jobs must be weighed against the unavoidable impact on the environment and social structures. The resettlement necessitated by lignite mining always means interfering with locally evolved ways of life. In the Garzweiler II mining area, for example, some 7,600 people in 11 major townships and some smaller units will have to be resettled in the course of 40 years. The relocation is not just about material possessions, for which appropriate compensation must be paid, but also about intangible values like neighborhood, home town and tradition, which cannot be measured in money terms.

The project: The Rheinbraun communication concept "Planning the resettlement scheme together", which was developed in 1997 on the basis of previous experience, aims at designing all stages of the resettlement procedure in close cooperation with citizens. The concept covers changes in procedures (e.g. on siting questions in the lignite mining plan procedure), the introduction of new options (e.g. house-building tailored to the needs of elderly citizens, retention of a townscape) and suggestions for specific communication forms, like the setting up of an information and advice center in the township to be resettled. This center's brief is to do justice to the multifarious needs for information experienced by all those involved, i.e. between residents themselves and in their dealings with local government, planners and Rheinbraun. Combining all the available advisory services at specific points and on specific dates makes orientation and fact-finding easier. Using this concept, over 50 events have been organized in the last three years with citizens from the townships of Otzenrath, Spenrath and Holz. In the planning of the new locations, the resettlees themselves, represented by specially set up citizens' councils, have done some important spadework.

Benefit for sustainable development: Benefit for sustainable development: High participation in the joint resettlement goes far to ensure that the various village communities go on existing in their own form. In this way, jobs in the businesses of the towns to be resettled and the tenability of the local infrastructure can be preserved. Also, joint development of the resettlement locations helps create attractive forward-looking townships with lower land needs than in the previous village structure, and this translates into tolerable maintenance outlays for local government.

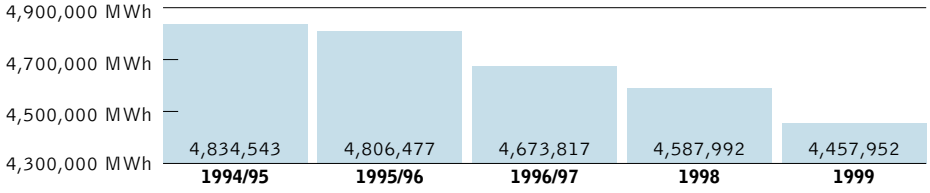
ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Conservation of wetlands worth preserving			
▪ Increase in percolation and discharge quantity by some 15 % annually in order to protect the wetlands in the northern section of the Rhenish mining area by extending the percolation, discharge and pipe systems.	by 2001	On the basis of an annual percolation capacity of 30 m cbm in 1995, a capacity of some 50 m cbm p.a. was reached by year's end 1999.	The environmental program is being updated, so that, even with higher dewatering rates owing to the Garzweiler II mine, the defined groundwater level can be maintained in the long run.
▪ Extension of a 7,500-meter-long and 75-meter-deep retention wall to 9,200 meters along the Lausitzer Neiße river to avoid a lowering of the groundwater.	by 2001	Some 8,500 m were completed by year's end 1999.	
▪ Construction of a pilot plant for ground water recharge and the refurbishment of a ditch system for an annual 3 m cbm of percolation water in the area of the Jänschwalder Laßzinswiesen meadows in the Lusatian mining area.	by 2000	Pilot plant set up. The program of trials continues until year's end 2000.	
Protection of groundwater			
▪ Avoidance of dump water acidification by additions of lime on a dump track to buffer the acid content of dumps.	by 2006		The test phase in the runup to Garzweiler II has already commenced.
Lowering energy consumption			
▪ Lowering the specific energy consumption of belt conveyor systems by 2 % at Rheinbraun.	by 2001	Speed-controlled drives are being installed in Niederaußem as from 2001, uniform quantities conveyed in current operations.	The program is being continued. Theoretical thinking on this is largely completed.
Reduction in emission			
▪ Setting up of a stationary dust suction plant and optimization of existing wet scrubbers in upgrading operations.	by 2001	Dust suction plant installed, refurbishment program for existing wet scrubbers completed.	Currently, optimization of various existing wet scrubbers with a view to minimizing dust emissions and water consumption.
▪ Reduction in heavy metals, dioxins and furans in the waste gas flows of processes and customers' waste incineration plants by developing a new process.	by 2001	Processes currently being tested, underpinned experience available by 2001.	Pulverized lignite coke is injected into the waste gas flow and then separated in the downstream electrostatic precipitator.
Reduction in mine noise			
▪ Construction of an approx. 1,100-meter-long and 7-meter-high noise protection wall on the northern rim of the Hambach mine.	by 1999	complete	
▪ Construction of a 520-meter-long noise protection wall at Viehöven, Inden mine.	by 2001		Start of construction measure at year's end 2000.
▪ Development of a measuring instrument for recording noise emissions at the belt equipment.	by 2001		Start of operating phase.
▪ Design-based acoustic optimization of the drive foundations.	by 2001	Theoretical preliminary investigation completed, start of pilot phase.	
▪ Preparation for the construction of a noise protection wall in the Jackerath area. Provision of an area to offset lengthy invasion by the Garzweiler II mine.	by 2001		Company planning procedure commenced.
Lower waste quantities			
▪ Thermal recycling of waste wood at the Berrenrath power plant.	from 1999	complete	
Improvement in environmental management			
▪ Creation of an environmental audit system.	1999	complete	
▪ Completion of a unitary environment manual.	1999	complete	
▪ Environment manual uploaded into the Rheinbraun intranet.	12/2000		

	Unit	Fisical year			Calendar year	
		1994/95	1995/96	1996/97	1998	1999
INPUT						
Energy						
Electricity	MWh	4,834,543	4,806,477	4,673,817	4,587,992	4,457,952
incl. own generation	MWh	1,928,175	2,126,807	2,201,156	2,125,967	2,063,869
Fuels*	1,000 l		20,200	29,548	27,970	26,862
Heat	MWh	2,004,722	2,091,944	1,571,667	0	0
Steam	t	97,764	39,257	14,692	885,840	1,665,747
Sewage sludge	t	79,596	133,485	130,090	127,559	141,874
Waste plastics	t	6,295	3,850	7,674	0	0
Water	1,000 m^3	999,759	1,007,280	980,066	991,711	1,030,057
Raw materials						
Raw lignite	t	168,307,623	167,797,096	157,513,302	146,396,547	137,250,667
Other mineral raw materials	t	4,743,033	4,171,111	3,711,815	5,994,883	9,309,829
Lime (for power plant)	t	15,037	12,509	14,146	32,107	52,487
Power plant waste for recycling	t	5,583,116	5,637,329	6,432,005	9,028,281	8,491,477
Consumbles and supplies						
Oils and greases***	t				1,785	1,558
OUTPUT						
Products						
Raw lignite	t	145,523,930	143,905,534	136,644,932	130,990,244	123,361,469
Upgraded products	t	7,072,727	7,241,514	6,504,106	4,875,799	4,843,731
Steam	t	2,628	2,903	1,342	1,029,208	679,853
Synthesis gas	1,000 m^3	190,420	120,810	165,576		
Mineral raw materials	t	4,762,972	4,190,408	3,711,815	2,696,634	3,977,813
Calcium fertilizer	t	19,939	19,297	19,675	23,110	25,274
Supply of water						
To third parties	1,000 m^3	206,718	211,111	201,980	215,577	218,273
Discharge in surface waterways	1,000 m^3	722,714	716,410	696,058	717,358	762,996
Emissions**						
CO_2	t	4,114,323	4,391,036	4,403,894	4,167,367	4,070,450
CO	t	490	597	549	386	455
SO_2	t	2,614	2,702	2,954	2,732	3,013
NO_x	t	3,048	3,077	3,277	3,215	3,139
Dust	t	1,452	1,386	1,149	855	851
Waste						
for own use***	t				403,375	314,177
for recycling	t		104,451	93,779	107,683	94,449
for disposal	t		18,513	16,552	22,393	15,793
Waste water	1,000 m^3	11,745	9,863	10,460	15,971	6,779
LOCATION						
Opencast mine operating area	1,000 m^2	157,661	160,848	163,413	174,374	178,753

* 1995/96 without LAUBAG ** Emissions relative to calendar year *** Evidence from 1998 on

Commentary The reduction in power consumption is mainly due to the decline in coal output and the fall in the sales of refined products. In the data up to 1996/97, "Input" includes both steam and heat. Since both energies use the same medium, they have been combined from 1998 on and are quoted as steam in t. The strong rise in steam consumption and the significant fall in steam output, waste for recycling and waste water are due to the shutdown of the LAUBAG mine-mouth power plants as of 1 July 1998. Since then, drying steam has been obtained from the VEAG power plant Schwarze Pumpe.
The extra consumption of lime is due to the dump acidification program: using lime prevents acidification of soils. The increase in the consumption of mineral raw materials is due to the amalgamation of Hürtherberg Steine und Erden and Rheinische Baustoffwerke and other companies in the fall of 1998. Waste plastics are no longer used, since the HTW plant for generating synthesis gas from lignite has been shut down.

Power consumption in MWh



Committed to Environmental Protection.

RWE-DEA Aktiengesellschaft für Mineraloel und Chemie is an integrated petroleum company with international chemicals activities. It includes numerous subsidiaries and affiliates in Germany and abroad.

The consolidated companies of the RWE-DEA group in Germany have around 7,000 employees (as of 31.12.1999). The group's activities encompass gas and oil production in domestic and foreign ventures, petroleum refining, sales of petroleum and petrochemicals, and the production and marketing of chemicals.

In Germany RWE-DEA's activities include the Mittelplate and Schwedeneck-See offshore drilling and production operations, oil and gas production in Holstein and Hohne, the Wietze Drilling Department and R+D Laboratory, and three gas reservoirs in Bavaria. The two DEA refineries at Heide and Wesseling refine crude oil to petroleum products and petrochemical feedstocks, and the Grasbrook Lube Plant in Hamburg produces base oils for premium lubricants. The company operates tank terminals at a number of strategic locations. The petroleum products are sold nationwide in Germany through some 860 company-owned service stations and around 775 branded distributor outlets, and by DEA marketing subsidiaries. The CONDEA plants at Brunsbüttel, Herne, Marl, Meerbeck and Witten produce a variety of base materials and intermediates, largely for the chemical industry. The chemical products are sold worldwide under the CONDEA label.

RWE-DEA's product spectrum embraces:

- crude oil, natural gas, motor fuels, heating and fuel oils, lubricants, specialties,
- olefins, aromatics, methanol and other petrochemicals,
- detergent raw materials, surfactants, fatty alcohols, high-purity aluminas, performance chemicals, solvents/fine chemicals.

Major environmentally relevant activities of the RWE-DEA Group are the extraction, production, refining and storage, and also the transportation and sale of substances that are flammable and dangerous to water. Most of its facilities are therefore subject to the regulations and authorization requirements of environmental legislation. The environmental aspects include emissions of gaseous substances such as sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) and of hydrocarbons, discharges of wastewater and the generation of waste, and also consumption of non-renewable resources. The task of minimizing emissions, waste and resource depletion is a constant challenge for the company.

As part of its industrial responsibility for environmental protection, RWE-DEA participates in German industry's voluntary commitment to reduce CO_2 emissions.

In this connection the German chemical industry has given a voluntary commitment in the energy sector, and the German petroleum industry has issued a climate protection commitment for the heating market. Under the chemical industry's worldwide Responsible Care Initiative, the CONDEA production plants have made a commitment to give top priority to protecting the environment and human health in all their activities. Further voluntary commitments joined by RWE-DEA include the voluntary undertaking by the German chemical industry to record and assess substances, especially intermediate products, to improve the information value of figures, and the ICCA (world chemical association) global burden-sharing initiative for screening of high production volume chemicals.

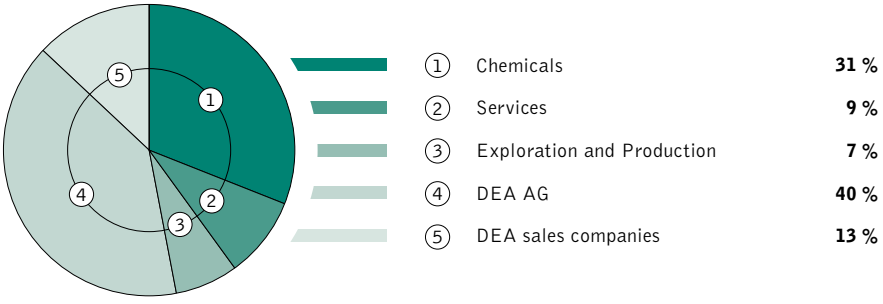
Information on climate protection and petroleum can be found in the "Klimaschutz" (Climate Protection) brochure published by the German Petroleum Industry Association MWV. It is available in the Internet (> www.mwv.de).

ENVIRONMENTAL MANAGEMENT

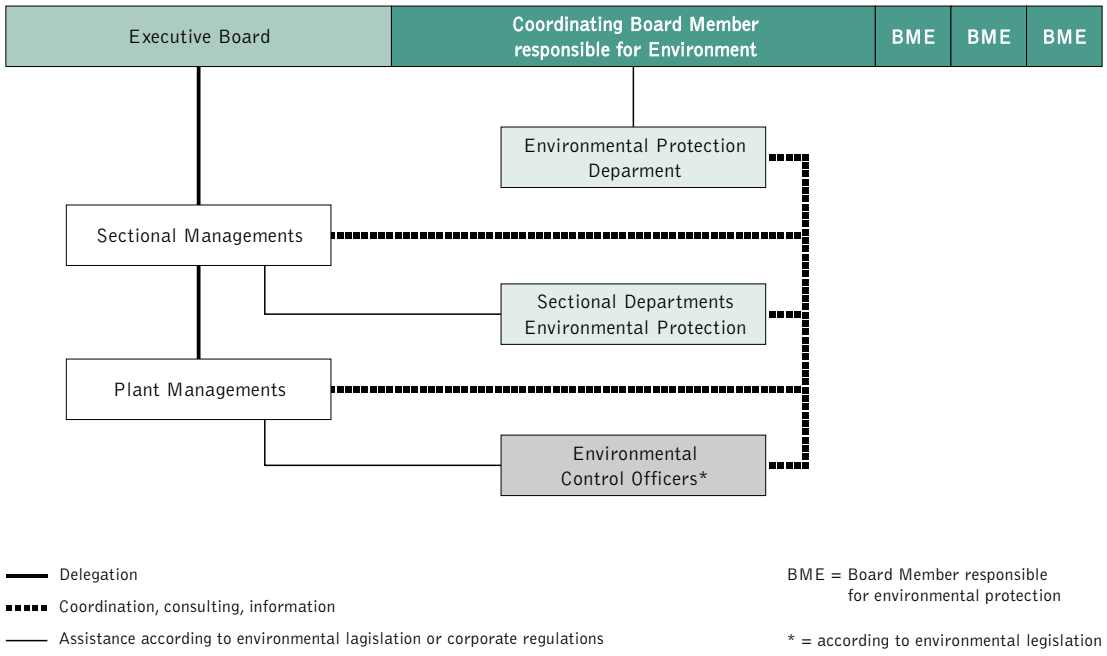
The "Environmental Policy Statement" of the RWE-DEA Group is an integral part of corporate policy with the aim of achieving continuous improvements in environmental protection within the company. It is part of a holistic approach that also includes the "Commitment to Quality" and the "Industrial Safety Principles and Guidelines". The public can obtain information from brochures, direct inquiries or in the Internet (> www.rwe-dea.de).

Responsibility for environmental protection rests with the Board of Management members for the operating divisions, one member being nominated as coordinator. The responsible members have delegated the individual tasks to the managements of the functional and operational

Employees of the RWE-DEA Group in Germany (as of 31.12.1999)



ENVIRONMENTAL PROTECTION ORGANIZATION OF RWE-DEA AG



sectors. The Environmental Protection Department, which reports directly to the Board of Management, deals with and coordinates major environmental issues. It advises the responsible persons in the operational sectors and their environmental protection organizational units, and the coordinators appointed under environmental legislation in the operating facilities. In their turn, the environmental protection organizational units in the operational sectors and the environmental coordinators advise and assist the responsible persons with regard to specific environmental matters.

On the basis of the certified Quality Management System, the existing environmental protection organization is being documented as a further module for the integrated management system for certification in accordance with DIN EN ISO 14001. Work procedures are defined in process and job instructions, which refer to manuals, operating instructions and plant regulations. A global task force coordinates the incorporation of environmental protection in the integrated management system. The CONDEA plants at Brunsbüttel, Herne, Marl, Meerbeck and Witten and the DEA plant at Wesseling have already been certified during the period December 1999 to March 2000 in accordance with DIN EN ISO 14001. DEA is aiming for company-wide certification in 2001.

At RWE-DEA, environmental protection is an integral part of training and development. The existing upgrading program has been expanded with the introduction of the Environmental Management System. In addition to the regular facility meetings dealing with questions of environmental protection at plant level, annual environmental conferences of staff working in the environmental protection field are also held. They are intended to promote an intensive interchange of experience between all sectors of RWE-DEA. The measures and potential savings implemented under the employee suggestions scheme also have environmental benefits. Examples of successful implementation of such suggestions are savings on heating steam at the xylene plant in Wesseling, self-cleaning of reactors by using monomers from ongoing production, and improved product yields as a result of changes in column operation.

RISK MANAGEMENT AND INDUSTRIAL SAFETY

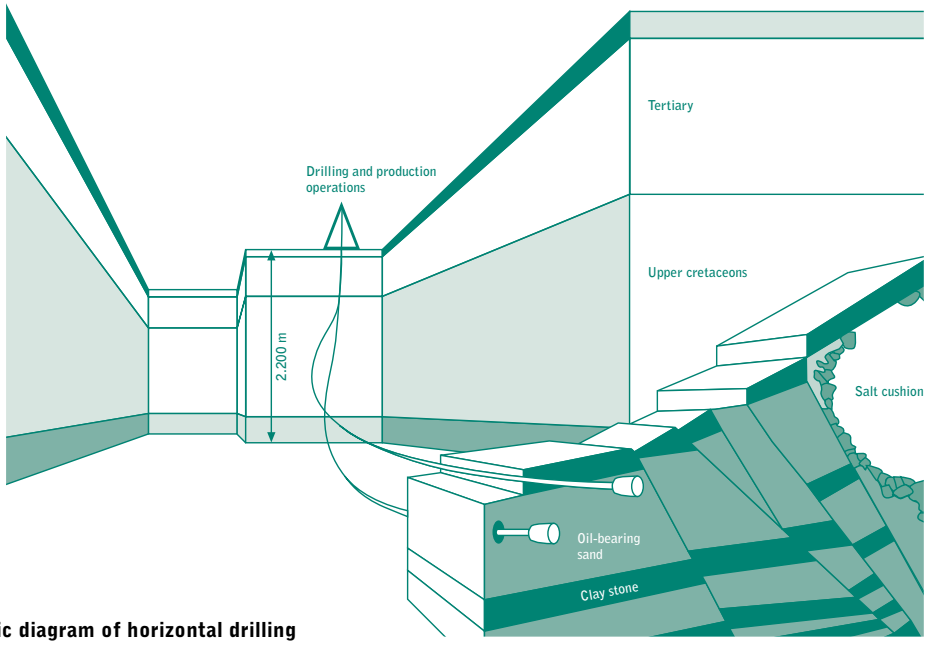
In order to minimize the risks to people and the environment arising from industrial activity, the company's technical facilities are regularly monitored, maintained and upgraded to take account of technical advances. All substances used in the operating facilities are registered and labeled in accordance with their risk potential. RWE-DEA has a comprehensive emergency organization with detailed alert plans and hazard containment plans at all operating facilities to ensure a rapid response capability in the event of an accident. Constant compliance with and improvement of industrial safety standards and accident prevention are documented in the "Industrial Safety Principles and Guidelines", which are implemented by means of special programs. The number of notifiable accidents in 1999 came to 51. This represents an accident rate of 7.3 per 1000 employees.

PURCHASING AND LOGISTICS

To ensure adequate observance of ecological aspects, the staff of Purchasing and Logistics are issued with a Purchasing Manual and procedural instructions in which appropriate rules are laid down. All technical contractors engaged to carry out work in RWE-DEA's German plants must be certified in accordance with the recognized SCC Rules (Safety Certificate Contractors).

Environmentally sound distribution of products starts at the transshipment points, for example at tank terminals and service stations. Here protective facilities ensure that substances dangerous to water cannot find their way into the soil or groundwater in the event of spillages. The service stations have vapor recovery systems to prevent gasoline vapors from escaping into the air during vehicle refueling. Steps have also been taken to prevent wastewater pollution: before the waste water from the service station is discharged into the sewage system, it undergoes a two-stage process to remove first the dirt and then the oil and gasoline residues. To minimize wastewater pollution, only environmentally sound cleaning products are used. In the interests of economical use of drinking water, many filling stations have treatment units for the washing water from their car-wash systems. The precautionary measures also include safe storage of raw materials and products.

Environmentally sound transport is effected via pipeline, inland waterway, rail and road. The company makes full use of its capacity rights on the product pipelines, which thanks to their great statistical reliability and low emissions are the most environmentally sound means of transport. The tank terminals are supplied by rail and barge. The company has introduced its own safety checks for rail tank cars. The service stations are supplied by road from the tank terminals using tank trucks. A more lightweight design has made it possible to increase their capacity by six percent, thereby reducing transport-induced emissions. On the barge transportation front, the company is introducing its own safety inspections and requiring shipping contractors to undertake preventive maintenance and personnel training. In the coastal shipping sector the proportion of chartered vessels with double hulls has been stepped up. For seagoing shipping there is a Chartering Policy and an Oil



Schematic diagram of horizontal drilling

The Mittelplate offshore oil field in the North Sea tidelands off Friedrichskoog still has recoverable reserves of around 26 million tons, about half Germany's oil reserves. Experience with the Mittelplate drilling and production island erected in 1985 has shown that trouble-free oil production is possible for long periods even in this sensitive ecosystem. However, owing to tidal restrictions on transport capabilities, its annual capacity is limited to around 800,000 tons. In order to optimize oil production from the field and complete it in a briefer period, the RWE-DEA/Wintershall joint venture has implemented and improved a drilling concept unique in Germany for exploiting the Mittelplate oil field from an onshore location: extended reach drilling. Using strongly deviated wells with a reach of over 8,000 meters that run horizontally for long stretches, the eastern part of the oil field is also being targeted from Friedrichskoog. The first production well, "Dieksand 2", with its environmentally sound drilling operations including noise abatement and water conservation measures and a seamless disposal system was successfully completed in May 1998. By mid 2000 the additional conditions had been created for offshore oil production from a shore-based location, with a planned production capacity of one million tons a year. This includes three more extended reach wells, the construction of a land station with sophisticated safety features for environmentally sound oil treatment, and the laying of pipelines to transport the oil to the customers.

Alert Plan. All crude oil importing companies in Germany are covered by contributions to the "International Oil Pollution Compensation Fund" in the event of environmental damage due to transportation of crude oil. This fund covers damage in excess of the shipping line's maximum liability limit. In addition, international technical rules for the construction of new vessels lay down the use of double-walled tanks and separate ballast tanks, as used for landing crude since the start of production at the Mittelplate production island in 1987.

PRODUCTION

Environmental impacts are minimized by using innovative technologies. Many systems on the Mittelplate production island, which produces around 800,000 tons of crude a year from Germany's biggest oil field, have been specially developed for tideland conditions. State-of-the-art technology, multiple safety features in all operations and experienced and responsible expert personnel make up an optimum safety package that guarantees reliable environmental protection in oil production operations.

Process and cooling water streams at the operating facilities are increasingly being managed as closed loops. The most recent example is the closing of cooling water circuits in the cooling towers of the DEA's Wesseling plant. Thanks to these measures and improvements in production processes the company has succeeded in reducing the volume of wastewater in recent years despite increased production at its operating facilities. At all facilities multistage wastewater purification systems using mechanical, chemical and biological treatment processes ensure that all wastewater is cleaned before it leaves the plant. In addition, highly polluted process water is pretreated before being released to the wastewater treatment systems.

Due to efficient utilization of energy and systematic use of cogeneration of heat and power, energy input is kept to a minimum. Moreover residual gases, including gases from flue gas collection systems, are now being used as fuel at the plants instead of being flared off. In the power station at CONDEA's Meerbeck plant, electricity is generated in a combined heat-and-power system which also makes use of the steam from a chemicals plant operated on the site by a joint venture. At CONDEA's Brunsbüttel plant the hot flue gases from the furnace are used directly for drying alumina, bringing a substantial reduction in energy input. The DEA refinery at Heide is putting a new hydrocracker into service as part of its restructuring program. The surplus heat generated by the unit will be used to heat schools, a swimming bath and a leisure center in the town of Hemmingstedt. The installation of a gas turbine has brought a further improvement in the efficiency of the power station at DEA's Heide refinery.

Other innovative technologies are the closed and hence emission-free cleaning processes for gas driers and the vapor recovery systems at the refineries and tank terminals, which also help reduce hydrocarbon emission levels.

Waste management strategies which include measures to reduce the amount of waste generated are drawn up at the operating facilities. The waste produced consists largely of sludge from wastewater treatment, spent catalysts, production-specific wastes, contaminated operating resources, dirty insulating material and contaminated soil. Here recycling takes priority over disposal.

RWE-DEA also observes the principle of waste avoidance in the optimization of its production processes and the packaging of its products. In the early nineties, for example, DEA with its oil dispensing unit was the first petroleum company to introduce returnable bottles for engine oil.

On January 1, 2000 a new generation of motor fuels made its debut on the German market: the new motor fuels, introduction of which is mandatory throughout Europe as from the year 2000 under the first step of the European Car/Oil Program, help to reduce the level of pollutant emissions due to road traffic. The new diesel fuels, for example, have – in addition to other improvements in fuel specifications – a lower sulfur content of 350 parts per million (ppm) compared with the previous figure of 500 ppm (0.05 percent by weight). The new gasoline grades Regular and Euro Super (premium) are supplied with a lower maximum sulfur content of 150 ppm, as against the figure of 500 ppm in force until the end of 1999, and with lower aromatics and benzene levels. The benzene content is a maximum of only one percent by volume, compared with the previous figure of five percent by volume.

Although not a mandatory requirement in Europe until 2005, the gasoline grade Super Plus with an extremely low maximum sulfur content of 50 ppm has been available from DEA since January 2000. The sulfur content of the Super Plus grade has thus been reduced by 90 percent in a single step. This means that an extremely low-sulfur fuel is now available for vehicles with the latest catalytic converter systems. To be able to comply with a sulfur limit of 50 ppm for all motor fuel grades, the German petroleum industry has mounted an investment program which will probably be completed by the end of 2001. It will then be in a position to supply all motor fuel grades throughout Germany with a maximum sulfur content of 50 ppm.

Removing the sulfur from these motor fuels requires large inputs of energy at the refineries, which in turn results in the emission of additional CO_2. This illustrates the need to take account of complex relationships and interactions with the environment in all emission reduction measures if undesirable developments are to be avoided.

PRODUCTS

Not only the production processes, but also the products themselves should have as little impact as possible on the environment. For this reason DEA discontinued the production and sale of leaded motor gasoline in 1996. As long ago as 1995 the sulfur content of diesel fuel was reduced from 0.2 percent to a maximum of 0.05 percent by weight, leading to a reduction in sulfur dioxide and particulate emissions from diesel-powered vehicles. Since January 2000 DEA has been supplying "Super Plus" gasoline with a sulfur content of 50 ppm (> European Auto/Oil Program, see above). A new heating oil additive has been developed and put on the market in DEA heating oil A Plus, bringing reductions in oil consumption and improvements in storage stability.

Another aspect of environmentally sound products is a long service life. This applies especially to engine oils, in the development of which DEA and Fuchs DEA are together targeting a service life of up to 100,000 kilometers for commercial vehicle engines. Biodegradability is particularly important for hydraulic fluids, as they are primarily used in the building industry. Synthetic esters consisting of readily degradable alcohols and fatty acids are used for the production of hydraulic fluids for mobile systems. DEA has long been offering lubricants containing components produced from rapeseed oil. Fatty alcohols and their derivatives used in the production of personal care products, cosmetics and pharmaceuticals, detergents and cleaners and fragrances are produced from petrochemical and renewable raw materials. The fatty alcohols produced using both methods are completely biodegradable and non-toxic. As a specialist in high-purity aluminas,

CONDEA also makes an important contribution to environmental protection with this product group. Aluminas with defined physical properties are used for high-performance long-life catalysts in petroleum refining, auto exhaust gas cleaning and chemical processes.

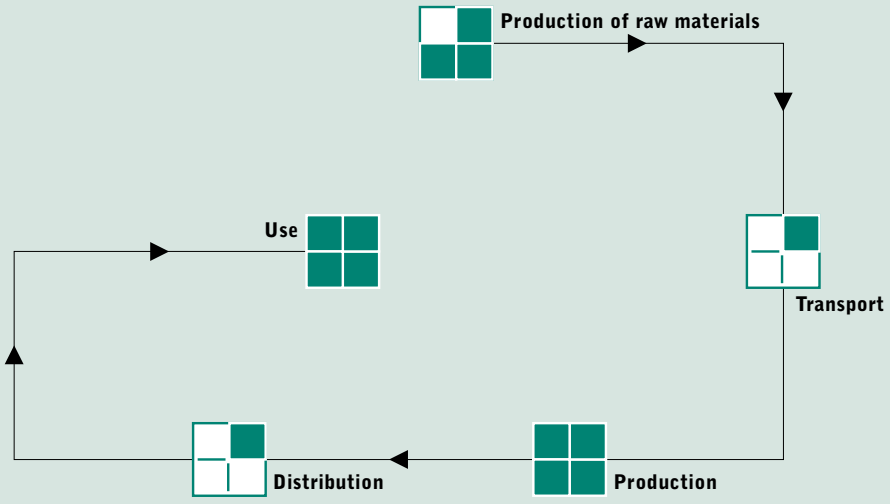
In order to establish a basis for investigation of environmental impacts throughout the product life cycle, work is currently in progress on preparing an industry-wide petroleum life cycle inventory analysis. With the participation of CONDEA, international experts have also drawn up life cycle assessments for the most important surfactants and fatty alcohols in terms of volume.

COMMUNICATION

The employees of the RWE-DEA Group regularly receive environmental information by means of bulletins, the employee magazine "Panorama", the "CONDEA-Info" distributed within the chemicals sector, and other publications. DEA keeps its marketing partners informed through the magazine "DEA Partner Magazin" and its service station dealers through the magazine "Zündschlüssel". Customers are regularly informed about the environmental aspects of the company's products by means of material safety data sheets, product bulletins and brochures. A variety of information sources are also available to the general public, including environmental brochures, plant brochures, information about safety measures, and environmental hotlines. The production sites Herne, Marl and Witten have also presented environmental statements under the EMAS Regulation. For many years RWE-DEA has been engaged in intensive cooperation with industry and technical associations on topical environmental issues. RWE-DEA also organizes Open House events and guided tours of its production plants.

SOCIAL ASPECTS

DEA offers its employees flexible working time models and opportunities for part-time employment. The company regularly makes resources available for ecological, social and cultural purposes by means of donations and sponsoring. The "DEA Mediathek" project run by Deutsche Verkehrswacht and DEA Mineraloel AG, for example, has been operating since as long ago as 1991. It aims to increase safety on the roads by means of effective measures to inform and educate people about road safety.



■ very high relevance ◪ high relevance ◧ medium relevance ◪ low relevance ⊞ no relevance ▭ not applicable

◪ **Production of raw materials** Crude production involves using non-renewable resources. Emissions into the air are minimized by the use of technically sophisticated, reliable and environmentally sound oil production techniques.

◪ **Transport** Atmospheric emissions occur during the transportation of crude oil. In the event of accidents there is a risk of oil leaks. By using pipelines and tankers with high safety standards these environmental aspects are largely minimized.

■ **Production** Crude oil refining and the production of motor fuels in the refineries involves large inputs of energy, the emission of atmospheric pollutants and the generation of wastewater and other waste. Energy consumption is reduced by means of efficient utilization of energy such as the use of combined heat-and-power generation. Multistage wastewater treatment plants limit emission levels. Solid waste is managed by environmentally sound means.

◪ **Distribution** During the distribution of motor fuels in rail tank cars, tank trucks and barges, hydrocarbon emissions may escape into the environment. The use of vapor recovery systems at refineries and tank terminals and also at service stations helps to minimize such emissions. Sealed driveways and collecting basins at refineries, tank terminals and service stations protect the soil and water from contamination.

■ **Use** The product is completely burned during use. The combustion process results in emissions including NO_x, CO_2 and hydrocarbons. Efficient combustion engines and catalytic converters minimize the emissions of NO_x and hydrocarbons.

ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Environmental Management			
▪ Establish an integrated management system for all RWE-DEA locations, embracing not only the quality management system already certified, but also the environmental management system currently in preparation; in 2000 the environmental management systems at the chemicals plants in Brunsbüttel and Meerbeck are to be certified in accordance with DIN EN ISO 14001.	2000	in progess	CONDEA plants at Brunsbüttel, Herne, Marl, Meerbeck and Witten and DEA refinery Wesseling have certification in accordance with DIN EN ISO 14001.
▪ Continue implementing Responsible Care rules (CONDEA plant Meerbeck)	6/2001		
▪ Continue work on establishing an environmental management system and incorporating it in an integrated management system (DEA refinery Heide).	12/2001		
Emission Reductions			
▪ Reduce SO_2 emissions by 100 tons a year by refining lower-sulfur products and closing down SO_2 extraction plant (Grasbrook refinery).	12/1999	complete	At least 300 tons a year.
▪ Reduce chlorinated hydrocarbon emissions by about 10 percent by adjusting production capacity (Grasbrook refinery).	12/1999	complete	About 30 percent, thanks to additional measures.
▪ Reduce hydrocarbon emissions by installing vapor recovery systems for motor gasoline refueling at service stations.	12/1998	complete	
▪ Start producing motor gasolines with a maximum benzene content of 1 percent.	12/1999	complete	Conversion work at refineries finished.
▪ Reduce diffuse ammonia emissions by 5 percent by improving machine integration (Grasbrook refinery).	12/2001		
▪ Reduce down time of vapor recovery systems by scheduling maintenance work for periods when no loading is taking place (tank terminals).	12/2001		
▪ Reduce specific diesel consumption and emissions (exploration and production).	12/2002		
Reductions in Energy Consumption			
▪ Reduce energy consumption by 5 percent by optimizing pump operating times for cooling water supply (Grasbrook refinery).	12/1999	complete	20 percent, thanks to better control of pump monitoring.
▪ Improve efficiency of power station at DEA's Heide refinery by 10 percent by installing a gas turbine.	1/1999	complete	
▪ Use the reaction heat of the MAn plant at CONDEA's Meerbeck site for cogeneration of steam and electricity.	2000	complete	
▪ Reduce energy consumption by 2 percent compared with 1999 by reviewing and optimizing energy requirements (CONDEA plant Witten).	12/2002		
▪ Reduce specific consumption of heavy fuel oil in the furnaces of extraction plant II by optimizing furnace control system (Grasbrook refinery).	12/2001		

ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Reduction in Water consumption			
▪ Reduce water consumption by 150,000 cubic meters a year by means of condensate circuit (DEA refinery Heide).	12/1999	in progress	Implementation in financial year 1999/2000.
▪ Reduce water consumption by 50 percent by means of closed-loops (CONDEA plant Meerbeck).	2000	in progress	Further process studies needed, objective carried over to financial year 1999/2000.
▪ Reduce groundwater extraction by 10 million cubic meters a year by means of closed loops (DEA refinery Wesseling).	12/1999	partly completed	Project still running in 2000, another cooling tower is being converted to closed-loop cooling water system.
▪ Reduce drinking water requirements by 1.7 percent (CONDEA plant Marl).	12/2002		
▪ Reduce fresh water consumption in fat interesterification unit by 20 percent compared with 1999 by reviewing and optimizing fresh water requirements (CONDEA plant Witten).	12/2001		
▪ Reduce municipal water consumption in boiler house by 5 percent by improving condensate recovery (Grasbrook refinery).	12/2001		
Reductions in Wastewater			
▪ Reduce wastewater quantity by 20 percent by means of wastewater recycling (CONDEA plant Brunsbüttel).	by 2000	in progress	Implementation in financial year 1999/2000.
▪ Reuse 20 cubic meters wastewater per hour (DEA plant Wesseling).	6/1999	complete	
▪ Reduce wastewater quantity and phosphate load by 25 percent and reduce fresh water requirements by 15 percent compared with 1999 (CONDEA plant Herne).	12/2001		
▪ Reduce wastewater quantity by 17 percent (CONDEA plant Marl).	12/2002		
▪ Reduce wastewater output of biological stage to an average volume not exceeding 200 cubic meters per hour (DEA refinery Wesseling).	12/2000		
Reductions in Noise			
▪ Extend noise abatement measures at CONDEA plant in Brunsbüttel.	by 2000	complete	
Reductions in Waste			
▪ Use returnable oil bottles at service stations.	on going		
▪ Reduce sludge output of wastewater treatment plant by 25 percent (DEA refinery Heide).	12/2004		
▪ Reduce waste volume by thermal treatment of drill cuttings and reuse of base oil (exploration and production).	12/2003		
Improvements in Risk Management			
▪ Implement measures arising from the HAZOP Study – Hazard and Operability Study Program (CONDEA plant Brunsbüttel).	6/2001		
▪ Work on tanks and collecting basins to improve environmental protection (Grasbrook refinery).	12/2010		
▪ Lay new wastewater pipes for oily and domestic wastewater systems (Grasbrook refinery).	5/2008		

Field of action: Know-how transfer to promote sustainable development worldwide.

Goale: The aim is to make use of synergies by sharing technological information. This involves identifying proven production and process technologies and implementing them throughout the group. Uniform standards for handling certain projects are to help strengthen the individual companies and thereby contribute to improving the competitive strength of the entire organization. A continuous improvement in production processes is also targeted.

Trigger: Due to its rapid growth within a short space of time, largely through acquisitions, the organization with its many international locations had a variety of company cultures and competing mentalities, which adversely affected the development of the group as a whole. As a result insufficient use was being made of the extensive know-how accumulated by the individual companies with their various strengths and skills.

The project: In the interests of "structured sharing of experience" a program known as the "Technology Exchange Network" was developed. This stands for a network of several teams of staff from the various companies who cooperate closely in the fields of process technology, maintenance, project management, plant operation, advanced process control, and safety and environmental protection. A Global Technology Coordination Manager coordinates the sharing of experience and other cooperation.

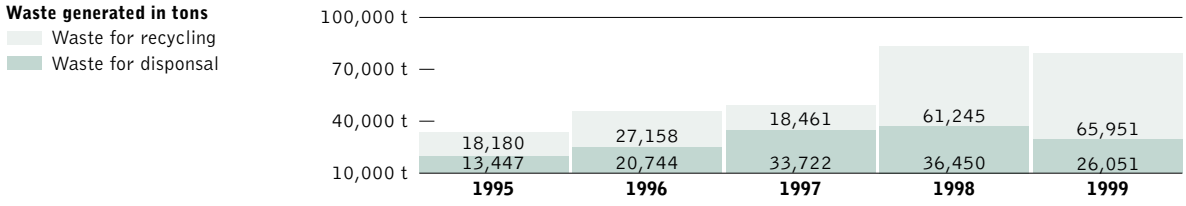
Benefits for sustainability: Transfer of know-how and technology means reductions in energy consumption, reexamination of raw materials input and yields, cost reductions, quality reductions and increases in productivity and efficiency.

	Unit	Calendar Year				
		1995	1996	1997	1998	1999
INPUT						
Energy						
Natural gas	1,000 Nm^3	13,120	16,044	14,114	9,505	10,589
Electricity	MWh			31,485	30,849	22,744
Motor fuels	t			4,900	4,938	5,295
Water						
Company-extracted	1,000 m^3	1,192	1,230	1,146	844	749
From third parties	1,000 m^3			28	53	29
Raw materials						
Crude oil	t	742,044	741,612	772,648	950,234	950,943
Natural gas and associated gas	1,000 Nm^3	1,678,468	2,411,832	2,481,033	2,093,173	2,562,192
OUTPUT						
Products						
Crude oil	t	742,044	741,612	772,648	950,234	950,943
Natural gas and associated gas	1,000 Nm^3	1,678,468	2,411,832	2,481,033	2,093,173	2,562,192
Emissions						
CO_2	t	23,921	29,252	41,217	45,897	54,461
CO	t	2	2	4	126	106
SO_2	t	0	0	18	20	20
NO_X	t	18	23	31	480	555
VOC	t				91	210
Waste						
Recycling	t	18,180	27,158	18,461	61,245	65,951
of which in need of particular monitoring	t				35,025	4,566
Disposal	t	13,447	20,744	33,722	36,450	26,051
of which in need of particular monitoring	t				16,577	5,245
Wastewater						
Wastewater	1,000 m^3	30.1	11.7	7.5	30	26
Cooling water	1,000 m^3	340	347	417	231	124

The figures relate to the exploration and production activities operated or lead-managed by RWE-DEA in Germany.

The data for input of natural gas represent that portion of natural gas production which is used for captive consumption.

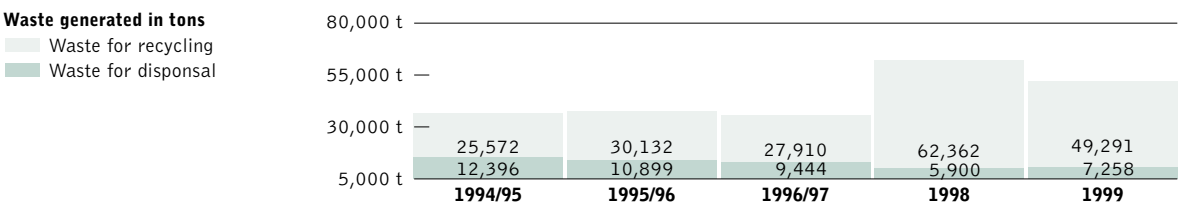
Commentary The figures for the exploration and production sector are recorded for the first time in accordance with the new data compilation guidelines of the German association of oil and gas producers. The resulting changes in data acquisition lead to higher emission figures in some cases.



Waste Substantial recultivation measures were undertaken in the exploration and production sector in 1998 and 1999, resulting in a marked increase in the quantity of waste for recycling.

	Unit	Financial Year			Calendar Year	
		1994/95	1995/96	1996/97	1998	1999
INPUT						
Energy						
Natural gas	1,000 Nm^3	181,319	186,885	205,657	159,651	170,298
Electricity	MWh	498,644	437,176	410,123	590,456	600,110
Water						
Company-extracted	1,000 m^3	39,393	38,700	32,004	35,242	34,787
From third parties	1,000 m^3	814	711	623	430	400
Raw materials						
Crude oil	t	10,452,000	10,070,000	10,855,000	11,220,102	10,602,164
Naphtha	t	733,000	582,000	526,000	390,404	359,983
Motor gasoline components	t	76,000	114,000	77,000	38,233	135,640
Flash distillate	t	45,000	45,000	45,000	36,948	7,811
Additives	t	11,000	11,000	11,000	14,200	6,948
Other	t	285,580	239,531	282,858	404,882	363,122
OUTPUT						
Products						
LPG	t	118,000	104,000	112,000	117,743	113,940
Motor gasolines	t	1,933,000	1,917,000	2,026,000	2,003,948	2,029,823
Middle distillates	t	4,853,000	4,721,000	5,172,000	5,446,402	5,156,369
Heavy fuel oil	t	955,000	887,000	837,000	943,285	845,277
Aromatics	t	633,000	634,000	698,000	685,648	639,139
Olefins	t	1,029,000	966,000	981,000	946,703	888,280
Base oils	t	107,000	106,000	126,000	409,035	383,831
Refined products DEA	t	143,000	137,000	140,000	120,289	66,895
Extracts DEA	t	92,000	101,000	86,000	70,749	52,366
Petrochemicals	t				159.355	125.208
Other	t	905,000	759,000	801,000	198,378	214,768
Electricity	MWh	29,361	30,331	41,252	280,942	257,350
Emissions						
CO_2	t	3,591,459	3,489,762	3,670,027	3,847,876	3,649,813
CO	t	143	133	137	164	211
SO_2	t	11,300	10,664	11,221	11,724	9,700
NO_X	t	4,275	4,058	3,880	4,149	4,000
Particulates	t	322	303	320	276	242
Hydrocarbons	t	806	773	799	899	975
Chlorinated hydrocarbons	t	264	228	264	209	128
Heavy metals	t	7	4	5	7	7
VOC service stations	t				617	623
Waste						
Recycling	t	25,572	30,132	27,910	62,362	49,291
of which in need of particular monitoring	t				52,792	34,979
Disposal	t	12,396	10,899	9,444	5,900	7,258
of which in need of particular monitoring	t				3,117	2,896
Wastewater						
Wastewater	1,000 m^3	4,586	4,348	4,017	4,065	3,754
Wastewater load COD	t O_2	226	219	206	185	188
Cooling water	1,000 m^3	54,183	53,579	51,821	50,624	44,413

Commentary The fluctuations in the figures for the petroleum refining sector are due in particular to the start of work on the restructuring measures at DEA's Heide refinery and to the slight overall increase in crude oil throughput in 1998. Since 1998 emission data for DEA's own service stations and stations operated by the DEA petroleum sales companies have been recorded separately in the petroleum refining sector under "VOC service stations" (volatile organic compounds).



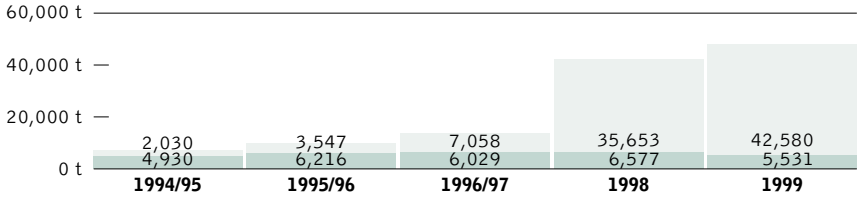
Waste The main factor responsible for the increase in waste quantities in the petroleum refining sector in 1998 and 1999 was the increase in waste for recycling as a result of the restructuring measures implemented at DEA's Heide refinery.

	Unit	Financial Year			Calendar Year	
		1994/95	1995/96	1996/97	1998	1999
INPUT						
Energy						
Natural gas	1,000 Nm^3	124,844	134,203	145,951	149,876	142,094
Electricity	MWh	90,677	58,006	40,924	178,996	180,203
Heating oil	t	32,600	32,300	32,900	24,229	27,410
Motor fuels	t	150	150	150	155	155
Water						
Company-extracted	1,000 m^3	12,753	13,322	13,180	13,255	12,165
From third parties	1,000 m^3	926	1,054	1,012	3,449	2,974
Raw materials						
Company specific	t	326,000	304,800	284,100	900,217	935,222
OUTPUT						
Products						
Company specific	t	399,100	379,100	384,700	1,107,596	1,132,564
Electricity	MWh	0	37,500	39,000	36,000	44,000
Emissions						
CO_2	t	322,200	336,700	363,420	484,999	470,135
CO	t	48	56	69	58	55
SO_2	t	561	556	567	533	532
NO_x	t	357	368	390	403	396
Particulates	t	69	66	70	53	51
Hydrocarbons	t	128	125	105	132	131
Waste						
Recycling	t	2,030	3,547	7,058	35,653	42,580
of which in need of particular monitoring	t				24,077	23,080
Disposal	t	4,930	6,216	6,029	6,577	5,531
of which in need of particular monitoring	t				2,522	1,901
Wastewater						
Wastewater	1,000 m^3	1,191	1,159	1,122	2,371	2,090
Wastewater load COD	t O_2	88	101	63	1,262	1,093
Cooling water	1,000 m^3	12,153	12,822	12,680	57,606	59,951

Commentary Following the chemicals sector's acquisition of the Herne, Marl and Witten locations from Hüls AG in 1998, the input and output data for the chemicals sector show an increase over the preceding years.

Waste generated in tons

Waste for recycling
Waste for disposal



Waste The increase in waste for recycling in the chemicals sector in 1998 is due to the inclusion of the three new CONDEA locations; the further increase in 1999 resulted from construction activities at the Herne site.

Recycling as a Strategy.

The operations of the RWE Group's Environmental Services Division are controled by RWE Umwelt AG. This company's business operations in the fields of waste management and recycling, water resources engineering/sewage disposal, and environmental consultancy are concentrated in five management companies. A particular focal point of operations is the recycling and disposal of wastes of all kinds.

To meet the high standards of the present-day waste management industry in terms of husbanding resources, the RWE Umwelt Group currently operates 136 recycling and waste treatment plants and, in its principal domestic subsidiaries, employs a workforce of 8,000 people. Europe-wide, a staff of about 12,500 work for RWE Umwelt.

The waste management and recycling division is concerned with the collection, transport, sorting, processing, and recycling or disposal of wastes. In Germany alone, the companies headed by the management companies RWE Umwelt Services Deutschland GmbH and (in North Rhine-Westphalia) Trienekens AG process and dispose of more than seven million metric tons of wastes per year. Abroad, waste management and recycling operations are controlled by the management company RWE Umwelt Services International GmbH, which is represented by its own companies, in particular in Austria, Spain, and several Eastern European countries, where operations are focussed. These companies dispose of the domestic refuse of several million people, as well as collecting and sorting recyclable materials, and planning and operating recycling and treatment plants and landfill facilities. In addition, they are active in the fields of winter services and street cleaning.

The range of services offered by the water resources engineering/sewage disposal division covers the planning, construction, and operation of drinking water supply and sewage treatment plants. Furthermore, the management company RWE Umwelt Aqua GmbH is at the service of customers from local authorities and industry as regards the implementation of financing and privatization models. It offers water resources engineering services in the fields of project management, sewage sludge disposal, and sewer maintenance. The environmental consultancy division* with its management company RWE Umwelt Consulting GmbH offers support in designing environmental process plants and also services in the fields of waste management and sewage disposal, air pollution control, infrastructure, surface recycling, and the remediation of contaminated sites. Further information on the business operations of RWE Umwelt are to be found on the Internet (> www.rwe-umwelt.de).

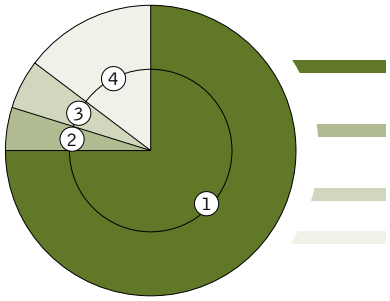
* This division has been spun off in the course of the year 2000.

The main operations of relevance to the environment are concentrated in the waste management and recycling division. The principal impact on the environment is due to the power consumption of the recycling plants and to emissions produced during the transportation of waste and the disposal of non-recyclable wastes.

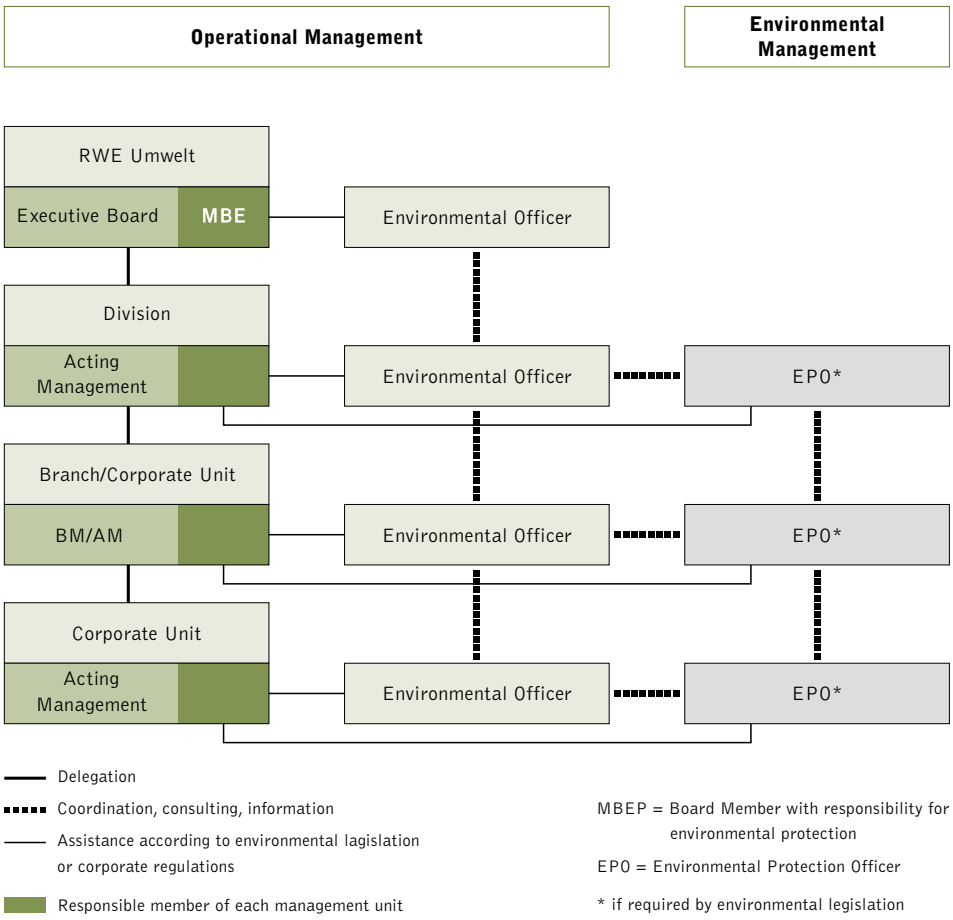
ENVIRONMENTAL MANAGEMENT

Overall responsibility for environmental protection lies with the Executive Board of RWE Umwelt AG, which has nominated a Board member responsible for the same. The Environmental, Quality, and Safety Management Directive issued by the Board in 1999 delegates responsibility to the various operational tiers. The Directive comprises RWE Umwelt's environmental guidelines and the basic parameters governing the activities of Company officers, precautions against hazards, and the reporting system. It is applicable to all subsidiaries in which RWE Umwelt holds more than 50 per cent of the shares. An obligation that the Directive places on foreign subsidiaries and affiliates is that "... lower environmental standards in non-EU states should not be used to avoid the environmental standards of the Federal Republic of Germany and comparable states".

Breakdown of sales according to RWE Umwelt divisions



1	Waste management and recycling (Germany)	**75,0 %**
2	Waste management and recycling (international)	**4,8 %**
3	Water resources/sewage disposal	**5,5 %**
4	Environmental consulting	**14,7 %**



Environmental protection tasks are embodied in descriptions of operational procedures and, where combined quality and environmental protection management systems exist, in management manuals. Most of the operating companies are certified in accordance with the specialized waste disposal company ordinance and have a quality management system, certified under DIN EN ISO 9001/9002, which takes specific environmental aspects into consideration. Compliance with the regulations is monitored by audits.

Regional study groups for experience interchange have been set up with the aim of including staff in the implementation of environmental protection. Furthermore, environmental protection is an integral part of the RWE Umwelt companies' training and advanced training schemes. At Trienekens, it is, in addition, integrated into the company suggestions system.

RISK MANAGEMENT AND INDUSTRIAL SAFETY

To ensure that everyone knows what to do in the event of potential emergencies, the various plants have laid down procedures and reporting channels in quality management rules or in in-house guidelines. Precautions against environmentally-pertinent accidents involving fires or hazardous materials are taken in coordination with the local authorities. If specific incidents occur, the management company concerned in each case and RWE Umwelt AG will be notified immediately.

In 1999, the number of occupational safety experts and safety officers appointed rose to a total of 255 compared with 214 in the previous year. The number of reportable accidents came to 808. That means that the ratio of accidents per 1,000 employees had been successfully reduced from 73.6 to 66.9 – a result to which the occupational safety programs contributed. In all plants,

any hazardous materials used are marked and listed according to their hazard potential so as to ensure that such hazardous materials are used safely.

PROCESSING AND RECYCLING

For large electrical appliances, Trienekens operates a dry-mechanical processing plant which permits the recovery of 98.5 per cent of the metallic components (iron, copper, and aluminium) at a high degree of purity. The recovery process is particularly environment-friendly, as it is characterized by low energy consumption and produces neither effluent nor emissions. At several RWE Umwelt Group sites, roughly 650,000 refrigeration units are recycled every year. In this field, moreover, RWE Umwelt has the market lead in the technology used to capture the chlorofluorocarbons (CFCs) present in the insulating foam of the older refrigerating devices. The re-utilization cycles for cullet and waste paper are now well-established: as a principal raw material supplier to the German container glass industry, RWE Umwelt collects and sorts more than 700,000 tons of cullet a year, which is ground into glass granules in four processing plants. RWE Umwelt is also a principal supplier to paper mills, with an annual quantity of roughly one million tons of collected and processed paper, cardboard, and chad.

A particularly great effort is required for the market-compatible recycling of light packaging materials. Nationwide, RWE Umwelt collects roughly 270,000 tons of these per year, sorting them in a total of 21 plants. The materials recovered are mainly reprocessed for subsequent utilization in the Company's own plants. The fractions consisting of plastic film, beakers, and hollow articles from the German Dual System (DSD) together with materials collected by the Company itself in the industrial sector are processed to give various kinds of high-purity granulates, which are reused in the plastics-processing industry. Plastic composites are mainly used to manufacture briquettes or pellets for subsequent use as raw materials. To separate off the increasing portion of PET bottles and other receptacles, since early 1998 RWE Umwelt has been operating a fully-automatic sorting module in one of the most modern plastics processing and recycling plants in Europe. The secondary granulate thus produced is returned to the production cycle.

With the production of secondary fuels, RWE Umwelt ensures that wastes that are not recyclable as materials can be used as sources of energy. On the basis of paper, plastics, and fibers/carpets, fuels with a high calorific value are produced that can be used, above all, in the energy-intensive lime and cement industry. The so-called rejected stock, which is unavoidably obtained in the form of a multi-material composite in the recycling of waste paper, is an example of this. Its calorific value having been successfully improved in extensive recycling trials, the material can now be used as high-grade fuel and thus contributes to reducing the ratio of residual waste and economizing on fossil fuels. A quality assurance system covering all stages of the recycling route ensures that no elevated pollutant emissions are generated during thermal utilization.

Subject to compliance with stringent quality criteria, biowastes, green wastes, and production wastes – approx 400,000 metric tons per year – are turned into compost products in the RWE Umwelt Group's composting plants. The products developed are tested by independent institutes, and the "Bundesgütegemeinschaft Kompost" (Federal Compost Quality Association) monitors compliance with the quality criteria associated with the RAL Quality Label.

WASTE WOOD

The thermal utilization of waste wood that has been treated has been made possible for the first time by Zapfendorf biopower station. Since 1998, waste wood that has been coated or glued has been incinerated there. As the wood contains various contaminants, special environmental engineering measures were necessary. They included a sophisticated flue-gas purification plant and a meter that continuously supplies emission data. The energy generated during the combustion of the wood, which is crushed to a size of 300 millimeters, is converted into steam and electric power. The steam is passed into the neighboring parquet manufacturing plant, the electric power being fed into the grid of the Franconian power supply system and paid for as renewable energy in accordance with the Renewable Energy Act (> p 113). These payments are the biopower and wood-fueled power station's main source of income.

LANDFILL OPERATION

The operation of landfills requires particular care, since escaping leachate and landfill gases can pollute the environment considerably. That is why all landfills have a multilayer barrier base which protects soil and groundwater from contamination. The leachate obtained in the landfill is collected via extensively-ramified drainage systems and purified by effluent treatment plants installed downstream of these to such an extent that it can be passed into public water courses without any reservations. Landfill gas, which mainly consists of methane of high calorific value, is also utilized in small-scale waste-to-energy power plants to generate heat and power. Information on the subject of industrial recycling in practice is to be found on the Internet (> www.bde.org).

LOGISTICS

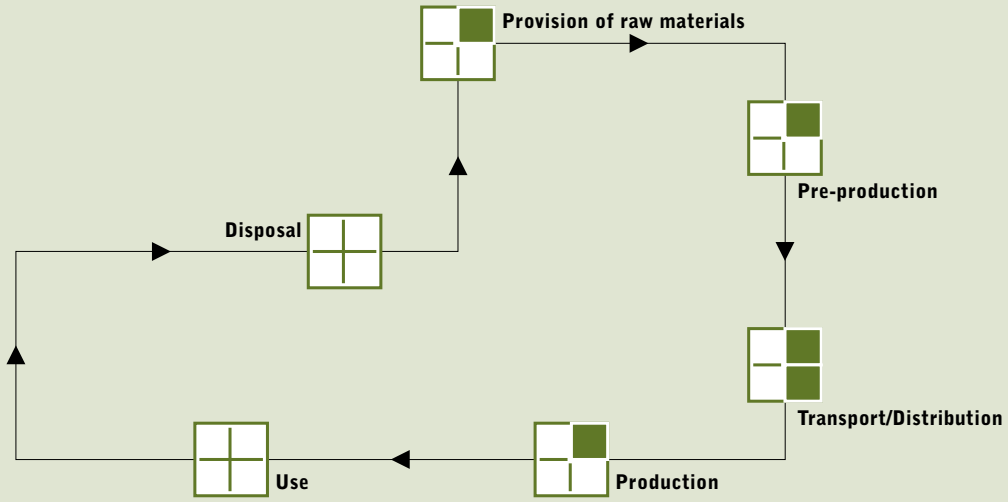
It is above all in the field of logistics, especially involving transportation by HGV, that the main environmental impact occurs. That is why trip optimization programs are used to reduce the number of no-load kilometers. Whenever possible, consignments are sent by rail. Thus, for example, three times a month trains carrying a total of 2,400 tons of waste timber leave Baden-Württemberg for Italy, where the timber is utilized in the chipboard production industry.

COMMUNICATION

In the plants belonging to the RWE Umwelt Group, brochures and staff newsletters and magazines offer information on topical environmental issues. Interested members of the public, customers, and suppliers are given an insight into the Group's environmental activities by open days or so-called "recycling days", which are held regularly at the various sites. Further measures include tours of plants, press conferences, and discussions with representatives of political bodies, authorities responsible for waste management, and environmental groups. RWE Umwelt representatives participate in various study groups, for example the Arbeitsgemeinschaft für Umweltfragen e.V. (Association for Environmental Questions), and in the committees of the Bundesverband der Deutschen Entsorgungswirtschaft (Federal Association of the German Waste Management Industry - BDE). Furthermore, many RWE Umwelt companies maintain close contact with the local colleges and universities. For example, by backing degree dissertations concerned with waste disposal and recycling problems, they tie in outside know-how contributing to the improvement of their own environmental services. Last year, an eco-balance relating to plastics recycling was prepared in the course of joint activities with institutes of the Fraunhofer Society.

SOCIAL ASPECTS

To enable employees to coordinate their work with their family lives more easily, RWE Umwelt offers flexitime models and part-time jobs. An annual in-house social report informs staff about training and advanced training schemes, occupational safety measures, and social activities. In 1999, the percentage of severely-handicapped persons employed was 2.2 per cent.



■ very high relevance ◪ high relevance ◧ medium relevance ◪ low relevance ⊞ no relevance ⊟ not applicable

◪ **Provision of raw materials** A major environmental aspect in the collection of light packaging materials (yellow sack) is the transportation procedures involved.

◪ **Pre-production** The sorting process requires energy. Residual waste is produced and this will possibly entail nasal nuisances.

◧ **Transport/Distribution** Transportation by HGV always entails emissions and the consumption of energy. The environmental impact is reduced by using low-emission and low-noise vehicles.

◪ **Production** Water and energy are used for shredding, washing, dissolution by heat, and regranulating. These environmental effects are reduced by process optimization such as countercurrent rinsing water delivery.

⊞ **Use** When the granules are utilized, usually in the form of new receptacles, it is primarily their transportation that has an environmental impact. This impact is relatively small on account of their low weight and repeated utilization.

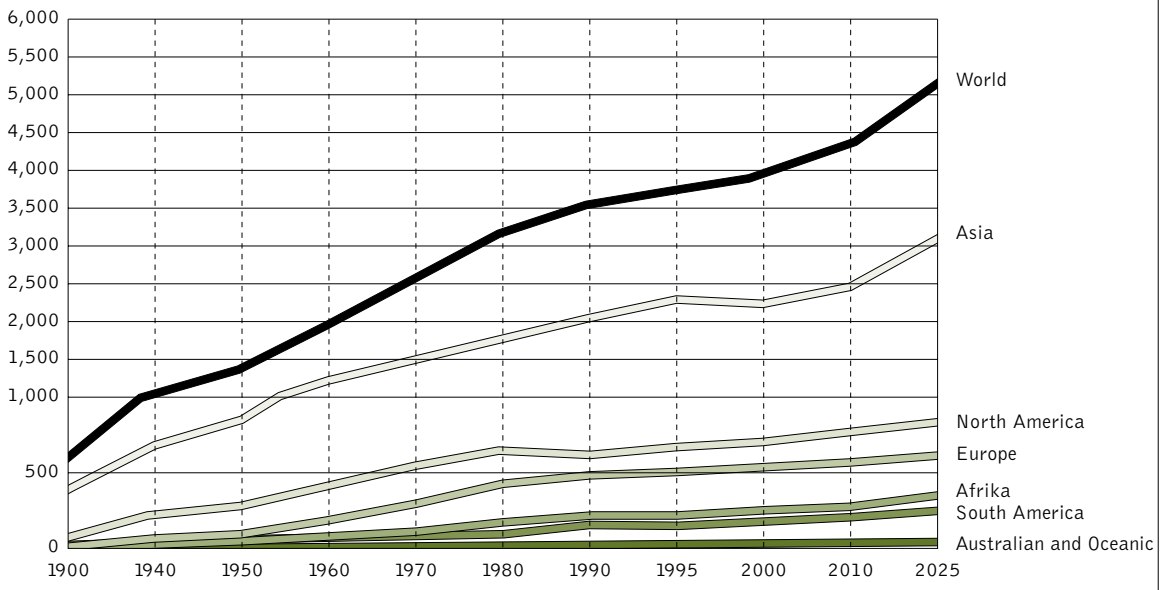
⊞ **Disposal** Ideally, the cycle is closed by total reutilization.

One of the great challenges of the future consists in supplying mankind with clean drinking water. Thus, the United Nations environmental program draws attention to the fact that, alongside climate-related problems, the fresh water crisis is the principal ecological threat. On the one hand, the world population is growing daily, on the other hand supplies of usable water are diminishing constantly. An additional factor that aggravates the situation is that the drinking water obtained is wasted due to the fact that water mains are sometimes in need of repair and that the public authorities frequently lack the know-how and capital required for their necessary renovation. Private-enterprise solutions help to ensure efficient and safe supplies of drinking water and proper sewage treatment – tasks that the RWE Group is increasingly establishing as its core capabilities.

The foundation of RWE Umwelt Aqua provided a focal point for the purposeful concentration of water resources engineering operations within the Group. Being a comprehensive supplier, RWE Umwelt Aqua has the necessary know-how and experience that enable it to work for local authorities and industry, both at home and abroad, at each stage of the water cycle. Thus, in Germany alone, either directly or via its subsidiaries and affiliates, RWE already supplies a population of about nine million with clean drinking water. By focussing its analysis, in an integrated fashion, on both the capital investment and the operating phases, and by efficient management, its aim is to help to break the link between economic growth and water consumption in order to promote sustainable development.

World-wide water consumption 1900 – 2025

per region in 1,000 m³ per year



Source:

Umweltbundesamt: http://www.umweltbundesamt.de

Field of action: Implementation of Recycling Systems

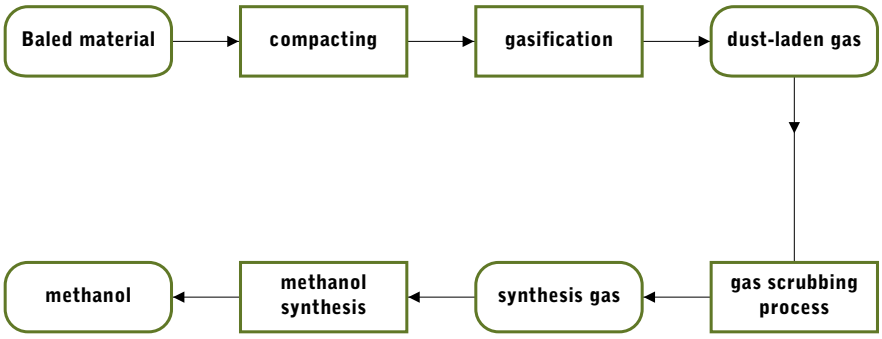
Goal: Owing to their non-homogeneous composition, some of the used packaging plastics collected by Duales System Deutschland GmbH (DSD) are not suitable for material recycling, as for this application the quality of the plastic has to be essentially maintained. For this fraction, an ecologically and economically expedient alternative to waste-to-energy uses is to be offered.

Trigger: The amendment of the Packaging Materials Ordinance in August 1998 increased the percentage of the plastic materials collected destined for recycling to 60 per cent. In turn, 60 per cent of this quantity has to be materially recycled. For 40 per cent, the type of utilization - recycling as materials or raw materials or waste-to-energy utilization – can be chosen, depending on the composition of the material. Despite the fact that it is only expedient to regranulate plastic packagings in some cases, this provision earmarked a large and cost-intensive proportion for material recycling. Moreover, since the demand for products derived from plastic composites is very limited, the targets of the Packaging Materials Ordinance appear to be hardly attainable.

The project: Based on the process used by the Schwarze Pumpe (SVZ) secondary raw material recycling center, plastic wastes – especially plastic composites – collected by the German Dual System can be re-utilized in an ecologically and economically expedient fashion: they are split up into their low-molecular components which are then used to synthesize the key chemical methane. This process thus ensures extensive high-grade material recycling. The Fraunhofer Institute, which was commissioned to prepare an ecobalance of the process, was able to show that, from an ecological point of view, it is by no means inferior to purely material recycling.

Benefit for sustainable: Since methanol is an important key chemical that is widely used, its synthesis in the SVZ process allows economies in the use of primary raw materials. Simultaneously, the proportion of substances to be landfilled is cut to ten per cent. The gases not required for the synthesis process are used to produce process heat and electric power. That makes the process independent of energy from outside. The gypsum obtained in the course of flue-gas purification can be recycled. Since the SVZ process entails less expense compared with material recycling processes, not only does it help to increase the proportion of plastic waste that is recycled, but it also contributes to the commercial viability of the recycling chain.

Schwarze Pumpe (SVZ) secondary raw material recycling center process



ENVIRONMENTAL PROGRAM	DEADLINE	PROGESS	COMMENTS
Climate preservation and protection of the atmosphere			
▪ Capture and evaluation of characteristic values based on haulage fleet performance figures and preparation of an overview of consumption values and transport performance values.	6/1999	in part	
▪ Use of standardized, sophisticated operations-related software also for the purpose of ongoing optimization of logistics.	12/2001		
▪ Increased deployment of low-consumption and low-emission vehicles in the haulage fleet; modernization of the HGV fleet (with vehicles based on Euronorm III).	continuous		
▪ Recording of fuel consumption at all Company sites.	12/2000		
▪ Introduction of a study group to systematically examine the possibility of increased use of rail transport.	12/2000		
▪ Final examination of landfills to see if they have yet to be equipped with gas sampling systems and whether or not quantities of gas collected can be economically used for power/heat production.	12/2000		
Environmental and landscape protection			
▪ Landscape-compatible recultivation of filled landfills.	continuous		
Prevention of water and soil pollution			
▪ Expansion of the composting business in order to ensure that use of commercial fertilizer is reduced and prevent the overfertilization of soil and groundwater.	continuous		Primarily by intensifying applications-related counseling.
▪ Final examination to see whether or not there is need for action in the field of landfill leachate collection.	12/2000		
Saving resources and waste avoidance			
▪ Introduction of new recycling processes, and the expansion of existing ones, such as additional plants for the production of 50,000 mt of substitute fuels per year.	12/1999	complete	
▪ Expansion of the production of secondary fuels, development of new areas of application for the substitution of primary fuels and for the reduction of CO_2 discharge.	continuous		
▪ Delivery of secondary fuels to the first power station.	6/2000		
▪ Improvement of sorting techniques.	continuous		
Improvement of environmental management			
▪ Agreement on and subsequent implementation of the "RWE Umwelt AG Environmental Management" Directive.	12/1998	complete	
▪ Establishment and documentation of environmental management systems in the management companies and company sites or operating companies.	6/2000	Work in progess	Introduction of environmental, quality, and safety management into all operating units by 2002.
▪ Incorporation of selection criteria into the procurement and purchasing guidelines yet to be drawn up.	6/1999	complete	
▪ Regular briefing, training and advanced training of staff on environmental topics.	continuous		
▪ Intensification of the dialog with the general public.	continuous		

	Unit	Fiscal Year		Calendar Year	
		1995/96	1996/97	1998	1999
INPUT					
Energy					
Electricity	MWh	23,290	30,155	130,553	129,720
Heating oil	t			58,775	72,000
Natural gas	1,000 m^3			1,237	1,653
Raw materials					
Cullet	t	682,701	705,583	725,431	711,939
Waste wood/timber	t			199,823	221,106
Construction site wastes (composites)	t			234,859	207,139
Construction site rubble	t			966,758	784,918
Wastes destined for disposal, subject to special surveillance	t			49,949	56,251
Recyclable wastes, subject to special surveillance	t			119,258	113,938
Biowaste	t			442,025	449,665
Excavated soil	t			797,294	686,171
Used electrical devices, electronic scrap	t	8,645	10,479	25,125	27,723
Industrial/production wastes	t			216,183	291,889
Domestic refuse	t			1,271,110	1.242,389
Industrial waste similar to domestic refuse	t			564,706	598,650
Refrigeration units	t	8,978	10,438	11,412	11,058
Recyclable plastics	t	52,385	80,475	107,042	114,220
Light packaging materials	t			268,252	277,829
Scrap	t			169,663	184,116
Paper, cardboard, chad	t			1,052,306	1,069,131
Bulky refuse	t			48,056	48,633
Other wastes destined for disposal	t			32,616	92,610
Other wastes destined for recycling	t			70,825	196,011
Water					
Other from own sources	1,000 m^3	0	262	291	305
Obtained from outside sources	1,000 m^3	420	42	234	174
OUTPUT					
Energy					
Electricity	MWh			38,567	40,919
District heat	MWh			45,000	42,200
Secondary raw materials					
Waste glass (processed)	t	617,303	627,593	583,139	563,453
Paper, cardboard, chad (sorted)	t			1,021,624	1,049,016
Compost	t			420,700	419,113
Plastic destined	t	11,572	15,894	81,051	93,065
Recyclable plastic	t	29,222	46,004	45,885	48,776
Waste wood/timber (processed)	t			126,227	163,337
Ferrous metals	t			189,417	207,102
Nonferrous metals	t			29,980	30,940
Recyclable mineral residues	t			247,668	254,312
Emissons					
CO_2	t	14,673	18,998	109,100	142,300
CO	t			14	15
SO_2	t			7	9
NO_x	t			70	80
Particulates	t			1	2
Wastes					
for recycling	t			2,246,715	2.348,328
of which in need of particular monitoring	t			84,413	88,402
destined for disposal	t			578,964	642,715
of which in need of particular monitoring	t			29,462	26,351
Effluent	1,000 m^3	420	303	473	417

Commentary The data for 1995/96 and 1996/97 only cover selected material streams of the present-day RWE Umwelt Services Deutschland GmbH and relate to the respective business years. Consequently, they are not comparable with the data for 1998 and 1999, as the latter – due to optimized data collection systems – now map all the material streams associated with all the consolidated companies of the waste management and recycling (Germany) division relative to each calendar year. Under the "Output" heading, (recyclable) wastes whose processing is outsourced appear under the collective item "Wastes destined for recycling". Wastes making up the input and that are disposed of in the Group's own plants do not reappear as output. Examples of this category are domestic refuse stored in the Group's own landfills or wastes requiring special surveillance, which are treated in the Group's own incineration plant.

Products for Tomorrow.

As represented by Heidelberger Druckmaschinen AG, mechanical engineering has special significance within the Industrial Systems Division.

In Germany alone, the company employs about 15,000 people at its Heidelberg, Wiesloch, Amstetten, Brandenburg, Kiel, Ludwigsburg, Leipzig, and Mühlhausen sites. Heidelberg's globally known sheetfed offset presses account for the bulk of the production volume. The operation in Kiel makes prepress devices, including scanners and film and plate imagers. Finishing equipment is built in Ludwigsburg, Leipzig, and Mühlhausen.

Foremost among the company's environmentally relevant activities are the production of cast parts of all sizes, the use of cutting fluids in machining operations, and to a lesser extent surface treatment by electroplating, painting and coating. Electronic components and assemblies are also produced. Significant quantities of raw materials are consumed, despite the fact that most cast parts are made by melting down the secondary raw material of high-quality steel scrap. Emissions are given off by the combustion of oil and gas to heat production halls and office buildings. At all sites, contaminant-containing effluents and wastewater from production activities are appropriately treated and cleaned before being channeled into the sewerage system. The company operates a total of five systems for which permits are required under the German Federal Pollution Control Act.

ENVIRONMENTAL MANAGEMENT

Responsibility for environmental protection rests with the Management Board Member for Technology of Heidelberger Druckmaschinen AG. He oversees the Corporate Environmental Department, which coordinates environmental protection activities in all companies belonging to the Heidelberg Group. All sites have also appointed environmental management representatives or waste officers, and some additionally have officers responsible for air and water pollution control, hazardous waste, and protection of workers from radiation and laser light. To avoid any risk for environment and employees which might arise from malfunction of a plant, company wide safety and emergency plans have been established. Responsibilities for all environmental duties are layed down in a so called organization handbook. Via internet all employees have access to this handbook.

Amstetten, where Heidelberg has its foundry, has been participating in EMAS since 1996. By the end of 1999, the Wiesloch and Brandenburg sites had followed suit, joined by Kiel and Heidelberg in the first half of 2000. With the goal of preventing waste or at least collecting it in reusable form, all plants have drawn up waste management concepts. Their waste recycling rates vary between 64 and 98 percent.

There is an internal employee suggestion system at five sites. Special campaigns carried out in 1999 on environmental protection prompted employees there to submit more than 200 suggestions for improvements. One suggestion was to switch off the CAD systems at the end of each workday instead of leaving them in standby mode. The amount of electricity saved by this simple measure adds up to about 13,500 kilowatt-hours a year.

ENVIRONMENTALLY ORIENTED PRODUCT DEVELOPMENT

At the start of 1998, Heidelberg Prepress initiated a project called ESPRESSO (**E**cological De**s**ign of **Pre**pre**ss** Pr**o**ducts) for the purpose of systematically trawling for ways of designing products for improved environmental friendliness. (Please see the product development case study below.) During the period under review, the Prepress and Direct Imaging both developed environmentally optimized products. Their declared goal was to largely dispense with chemicals. The new equipment therefore operates without any chemical developing processes. No silver halide films are used, either. In addition, a new ink feed system for sheetfed offset presses cuts down the amount of leftover ink that has to be disposed of as hazardous waste. Waste is also significantly reduced by inking system temperature control, remote oscillator adjustment, and new control software. This keeps paper consumption in the print shop at lower levels. Since 1995, Heidelberg has been offering presses that only require low-emission or emission-free cleaning agents for the rollers and blankets, which greatly curbs air contamination and odors in the pressroom. Parallel to these activities, in 1995 Heidelberg had joined other companies, the German National Print and Media Association, the German accident prevention and insurance agency for the printing and allied trades, and the FOGRA Institute to launch an industry initiative titled "Low-Emission Offset Printing". This collaborative effort has been pivotal in driving a large-scale switch to low-emission cleaning agents in the German graphic arts industry.

COMMUNICATION

Since 1993, the company has published an annual environmental report to inform its workforce and customers, the authorities, and the public. It can be downloaded from the Internet (> www.heidelberg.com). The Amstetten, Branden-

burg, Kiel and Wiesloch site have all drawn up environmental statements (> available on request from Heidelberger Druckmaschinen AG). Regular articles in the employee newsletter, the "Heidelberg Post", and postings on noticeboards around the company also promote communication with staff on environmental topics. Since October 1999, a dedicated "Environmental Newsletter" has appeared on a monthly basis. Customers around the world also receive the booklets of the "Printing and the Environment" series, which is published in several languages.

Heidelberg's environmental dedication has already received accolades from outside organizations on three occasions. For instance, WWF Germany and the German business magazine "Capital" jointly chose to honor the company's former Management Board Chairman, Hartmut Mehdorn, with the title of "Eco-Manager of the Year". The Kiel site was also awarded an environmental prize by the city of Kiel, which is the capital of Schleswig-Holstein state. Heidelberg has also dispatched representatives to numerous outside bodies, including the initiative "Environmental and Business in the Rhine-Neckar Triangle" and the working group "Environmental Policy" of the Association of German Mechanical and Systems Engineering Companies (VDMA).

SOCIAL ASPECTS

Heidelberg offers its employees flexible working hour arrangements and opportunities to work part-time. An in-company report appears every two years on the social aspects of the company's activities. In order to foster the spread of environmental awareness, last year Heidelberg printed and distributed a number of publications on environmental themes free of charge. They included the environmental statement of the International Comprehensive School in Heidelberg and posters for a conference that college students organized on the issue of sustainability at Expo 2000. In addition, the company assumed the expenses incurred to the German National Print and Media Association for publishing a brochure (> "Environmental Protection for the Printing Industry from A to Z"; it can be obtained free of charge from Heidelberger Druckmaschinen AG).

Field of action: Activities to implement an environmentally oriented product policy

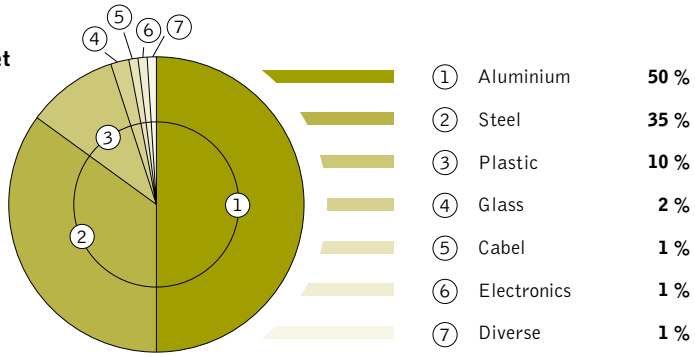
Goal: To integrate environmental protection into product development processes. The ultimate aim is to environmentally optimize products through all phases of their life cycles, doing so by improving the information base, providing required tools, and striving to enhance employee awareness.

Trigger: The planned German ordinance on disposal of electronic scrap has prompted the company to attach much greater importance to the recyclability and disposal of its products, and especially relatively short-lived prepress devices. Stricter laws mandating product-related environmental protection have also focused greater attention to the topics of product liability, product responsibility, and disposal.

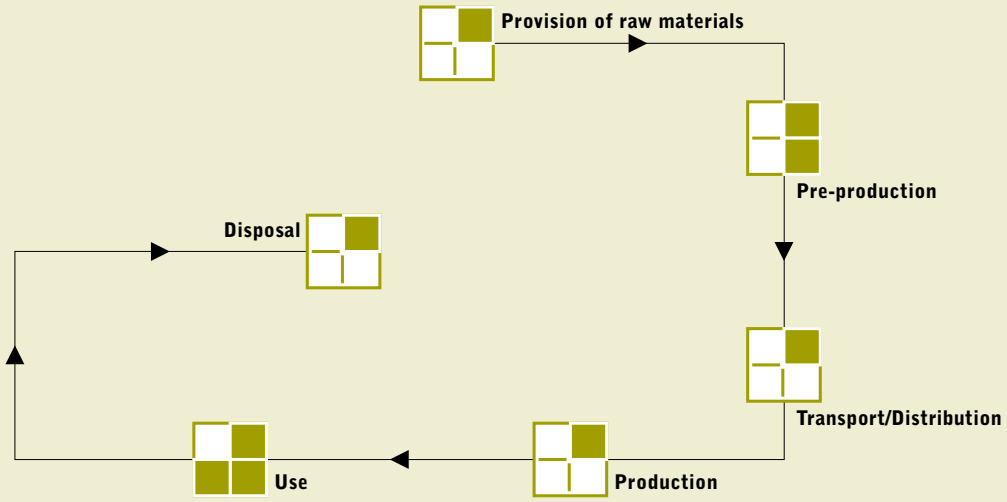
The project: To prevent environmental benefits from being sacrificed to functional and cost concerns, the ESPRESSO project was set up at the Prepress Business in Kiel. It was launched at the direct request of top management and conducted by the Environmental Management department. Because the project actively involved all other departments, such as Marketing, Development, Service, etc., and because it worked diligently to share information within the company and cooperate with other firms, it was such a resounding success that there are now plans to extend it to embrace the entire Heidelberg Group. The outcome of the project was a manual listing critical substances. This lets developers and purchasers see which primary and secondary materials and additives they should not use for environmental reasons. The manual also contains documents covering the selection, labeling and recyclability of materials. At the same time, process descriptions and documented procedures were issued specifying when Environmental Management must be involved in product development. No products will be released for sale anymore unless they have been vetted by Environmental Management.

Benefit for sustainaable development: Benefit for sustainable development: Disposal and disassembly instructions have been prepared to give both customers and their disposal companies to optimally recycle or dispose of prepress products from Heidelberg. This goes hand in hand with easy-to-disassemble designs for the new imagers and scanners. Pollutants and toxic substances, such as beryllium springs, have been eliminated; the use of plastics has been standardized, and the number of screwed-together parts greatly reduced. Users now also benefit from up to 20 percent less power consumption with some new pieces of equipment. And new product designs have reduced the use of materials from 150 to 90 kilograms in several others.

Materials balance sheet of the Topaz* flatbed scanner



*Note: This device is no longer sold. However, the project findings have also been applied to develop the new high-end Nexscan scanner.



very high relevance | high relevance | medium relevance | low relevance | no relevance | not applicable

Provision of raw materials The chief environmentally relevant aspect is the mining of ore to derive metals. Using iron scrap reduces resource consumption.

Pre-production Making cast parts consumes energy and produces emissions and wastewater.

Transport/Distribution During shipping by truck, air pollutants are released. The railways and ships are used to the greatest possible extent.

Production Metalworking, surface coating, and electronic production are associated with high energy consumption, emissions, and noise. In addition, waste and contaminated wastewater are produced. The production processes in use are being continually improved. Successes include the introduction of dry machining without cutting fluids, and powder coating that does not release any solvents.

Use The printing process consumes energy, paper, and inks. Noise is created, waste ink and waste paper is produced, and hydrocarbons are emitted during cleaning of the printing units.

Disposal Metal-containing waste is produced. The presses have a long service life. Centers are in place around the world to remanufacture used presses. Most used presses that have reached the end of their service life are disassembled in low-wage countries and nearly completely recycled.

ENVIRONMENTAL PROGRAM (HDM)	DEADLINE	PROGRESS	COMMENTS
Environmental management			
▪ Implementation of EMAS at all existing German sites (establishment of an environmental management system, capture of material and energy flows, preparation of an environmental program, creation of an environmental statement).	by 2000	100 percent of old sites by July 2000.	In 1999 three new sites joined the Group in Germany.
▪ Introduction of an environmental management system in compliance with ISO 14001 at the Mühlhausen site.	2001		
Optimization of products in all life cycle phases			
▪ Establishment of a system for ascertaining the legal environmental requirements products must meet.	3/2001		
▪ Ecological inspection and approval of environmentally relevant products.	Starting in 4/2000		
Soil and water protection			
▪ Checking of the wastewater network for leaks by running inspection equipment through all sewers at the Wiesloch and Leipzig sites	3/2001		
▪ Introduction of a system in Purchasing for checking for hazardous substances	3/2001		

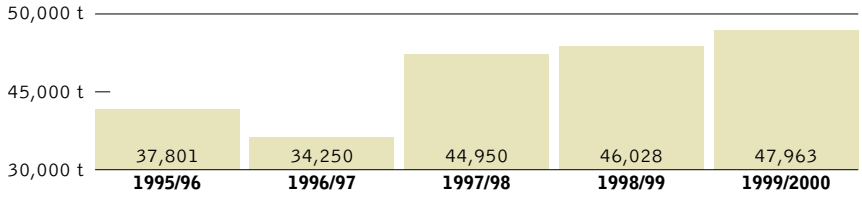
	Unit	Fisical Year				
		1995/96	1996/97	1997/98*	1998/99	1999/00**
INPUT						
Energy	MWh	333,900	338,100	376,500	370,700	389,800
Natural gas	MWh	110,000	114,000	139,900	131,800	135,900
Electricity	MWh	186,600	182,200	211,400	215,100	230,000
Oil	MWh	17,000	24,000	8,700	8,600	9,900
District heating	MWh	20,300	17,900	16,500	15,200	14,000
Water	1,000 m^3	260	265	312	333	361
Raw materials						
Cast raw materials/metals	t	37,801	34,250	44,950	46,028	47,963
OUTPUT						
Products						
Printing machines, Prepress Products	t	48,077	48,602	58,760	59,885	58,167
Finishing-Products	t					4,757
Manufacturing-Products***	t					4,175
Emissions						
CO_2	t	26,397	34,201	30,208	28,470	28,815
SO_2****	t	1.6	2.0	3.5	3.4	4.4
NO_x****	t	3.0	3.0	15.5	13.6	14.5
Particulate	t	7.1	6.1	6.1	11.6	12.0
Hydrocarbons*****	t	46.0	44.0	26.0	25.3	25.3
Waste	t					
Recycling	t	27,485	25,364	33,583	36,692	41,311
Disposal	t	5,333	4,662	4,332	2,896	2,970
Wastewater	1,000 m^3	210.4	235.1	252.1	259.3	289.2

* since 1997/98 site Kiel included ** since 1999/00 sites Leipzig, Ludwigsburg, Mühlhausen included *** sales to external companies

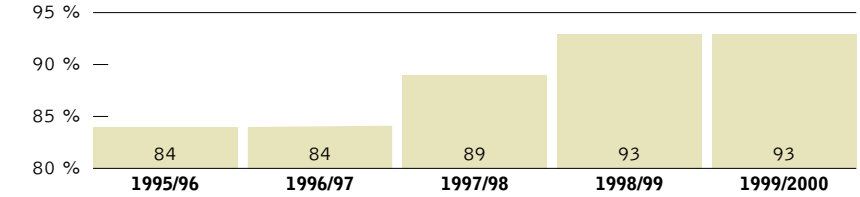
**** since 1997/98 emissions calculated from oil and gas consumption included ***** 1997/98 switch to solvent-free paints

Commentary For 1999, the consolidation group was extended to include the Leipzig, Ludwigsburg and Mühlhausen sites, which make finishing products. The growth of Heidelberger Druckmaschinen led to an increase in nearly all input and output values.

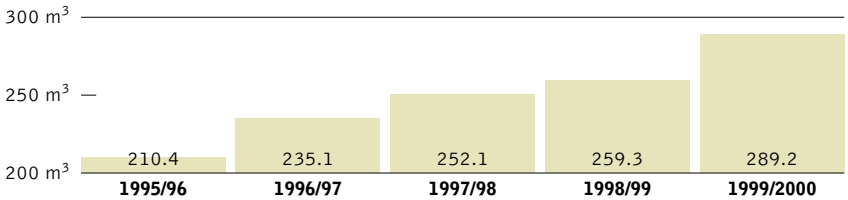
Consumption of cast raw materials and metals



Recycling portion



Wastewater flow



Environmental awareness in planning, operations and consulting.

Since the end of 1999, the activities of the former LAHMEYER AG and the NUKEM Group have been incorporated into TESSAG Technische Systeme & Services Aktiengesellschaft. As one of the leading providers of integrated technical systems and services (Multi-Utility Services) in the energy sector, TESSAG employs some 18,000 people in over 100 countries, 14,000 of them in Germany. The company is based in Frankfurt am Main.

TESSAG is a leading service provider spanning the entire life cycle of infrastructure projects, networks, industrial plants and buildings. TESSAG's Business Units are Network Technology, High-Voltage Technology, Consulting Engineering, Industrial Projects, Solar Technology, Communications Technology, Building Systems, Industrial and Power Plants, Nuclear Services, Power Supply and Transformers. TESSAG also has a financial holding, Maquet AG, the world's leading supplier of medical technology (> further information is available on the Internet at www.tessag.com).

When it comes to effects on the environment and the environmental management requirements these imply, a distinction is made between companies with their own production operations, i.e. equipment engineering (> p. 104), and those companies which are involved in plant engineering or engineering consulting (> p. 109). The companies in the NUKEM Group, which were not incorporated into TESSAG until the end of the 1998/1999 reporting period, are still listed separately (> p.111).

ENVIRONMENTAL MANAGEMENT AT TESSAG

Responsibility for environmental protection lies with a member of the Executive Board of TESSAG and with the management teams of the individual companies. A central environmental officer has been appointed to oversee the coordination of environmental protection. An environmental protection management system providing framework regulations for all the individual companies is currently being developed.

The basis for environmental protection are the guidelines of the RWE Group and the areas of activity aimed at sustainability. In March 2000, TESSAG also drew up and approved its own company-specific principles based on the environmental guidelines of the former LAHMEYER AG.

ENVIRONMENTAL GUIDELINES AT TESSAG

Environmental protection secures the foundations of our life and aims to achieve sustainable development. We accept our part of this global responsibility and strive to apply the following guidelines to the activities of all our companies:

1. We make environmental protection one of our top corporate goals, and practice it as an integral part of our corporate policy.

2. We see environmental protection both as a duty to our staff and the public and as an opportunity to continually improve our environmental efficiency.

3. We fulfil all environmental provisions and also strive to constantly improve environmental protection, provided this is economically viable.

4. In order to save natural resources, we use processes and combinations of processes which are geared towards saving raw materials and energy wherever operating conditions permit.

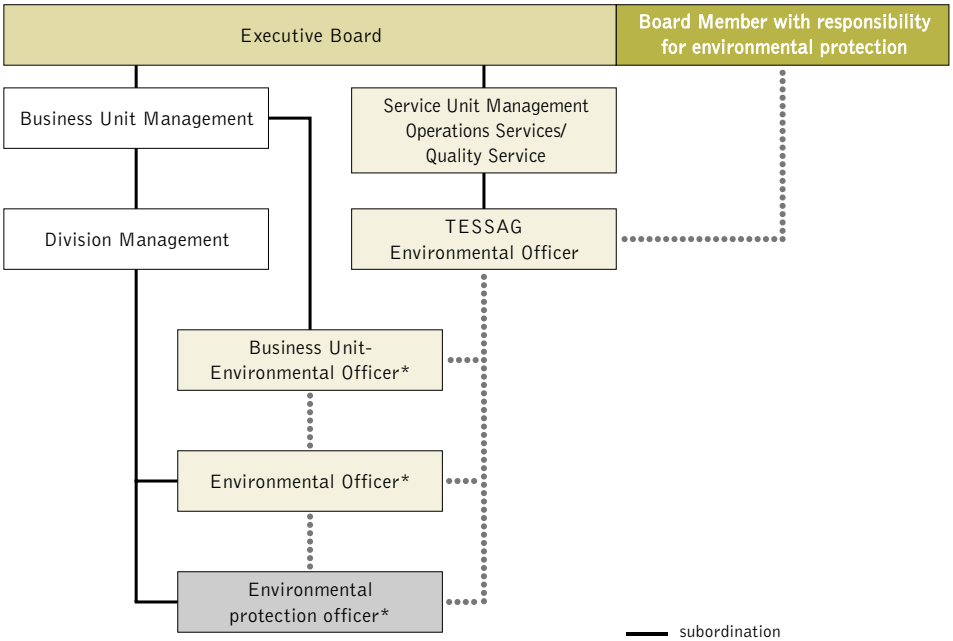
5. We create the conditions in which to minimize the environmental effects of our activities by using the latest technology, targeted staff communications and staff training.

6. Protecting the life and maintaining the health of our staff is an ongoing obligation and forms an integral part of our efforts to protect the environment.

7. Open dialog with employees, business partners, the authorities and the public is the basis on which we develop efficient solutions to environmental issues in a consensual manner.

COMMUNICATION

In order to involve its staff, TESSAG publishes reports about environmental issues and measures in its in-house magazine and in other communications. Product brochures and consulting meetings provide customers with specific information tailored to their precise needs. Information about current issues of general interest is communicated through press releases.



THE ENVIRONMENTAL PROGRAM AT TESSAG

TESSAG's environmental program is composed of two parts. These are the environmental program for TESSAG (management company) itself and the environmental programs for the various individual companies that make up the TESSAG Business Units (> p. XY). The individual companies bear full responsibility for their operational activities and for fulfilling the associated environmental protection obligations.

MEASURE	DEADLINE
▪ Introduction of risk prevention measures and an emergency reporting system.	by 6/2000
▪ Development and implementation of a concept for performing environmental due diligence audits.	by 6/2000
▪ Regulation of environmentally relevant processes by incorporating regulations into process organization (e.g. procurement).	by 12/2000
▪ Development and introduction of an information and training system for staff.	by 12/2000
▪ Development and introduction of an internal auditing system to assess and document compliance with statutory and internal provisions on environmental protection.	by 12/2000
▪ Extension of the environmental reporting and information system (UBIS) to all production sites (majority interest).	by 6/2001
▪ Calculation and comparison of environmentally relevant operating costs and potential savings.	by 12/2001

Equipment engineering.

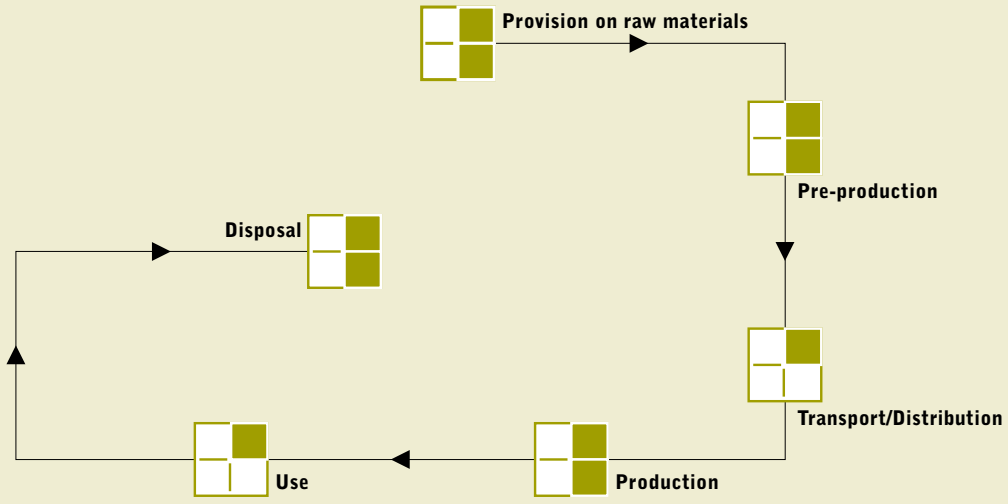
Equipment engineering generally includes the building of electro-mechanical components, power supply systems and medical technology. Although the products of the TESSAG companies Piller GmbH, Starkstrom-Gerätebau GmbH (SGB) and the financial holding Maquet AG are very different, their manufacturing processes and related environmental aspects are very similar, since the main activity of all three companies is the working and processing of metal.

Piller has two production sites – in Osterode and Mechernich – and a workforce of 1,000. It manufactures power supply plants, generators, electro-mechanical components, systems and compact transformer stations. The metal surfaces of its components are coated in an electrostatic powder coating unit. In order to reduce environmental pollution, the company has installed comprehensive waste water treatment plants and recirculation systems to save water.

SGB produces oil-cooled network, distribution and air-cooled cast resin transformers, and also offers repair services for this equipment. It has two locations in Regensburg and Neumark, and employs around 1,000 people. Its environmentally relevant activities include surface treatment in coating and spraying plants and the use of oil. SGB Maschinen-Service GmbH takes back ex-service transformers and recycles them. In the case of old transformers containing PCBs, the transformer oils are removed and disposed of as special waste. The process of replacing transformers and condensers containing PCBs will be completed by the end of the year 2000.

Maquet, with its subsidiaries MediKomp GmbH and orto Maquet GmbH & Co. KG, produces operating tables, hospital equipment, medical components and surgical robots at its sites in Rastatt and Peiting, and employs over 1,000 people. Degreasing and coating units and an electrolytic polishing unit with its own waste water treatment system are used in surface treatment. To save water, the production water is recirculated, and waste water containing paint is treated.

The major environmental aspects of equipment engineering operations are the volume of waste, waste water contamination and emissions from paintshops and heating plants into the air. There is also a risk of groundwater contamination from the use of substances hazardous to water, such as oil, and from the trichloroethylene still used by Maquet in a closed degreasing plant.



very high relevance | high relevance | medium relevance | low relevance | no relevance | not applicable

Provision of raw materials The mining of iron and copper ore has an impact on the environment.

Pre-production The extraction and processing of metal consumes energy and causes emissions.

Transport/Distribution Transport causes air pollutants.

Production The manufacturing process generates emissions, noise, waste and waste water and consumes energy. Plant encapsulation, exhaust gas filters, noise screening measures and recirculation all help to reduce emissions measures are not in place.

Use Use generates heat. Leaking transformer oil can present a hazard to soil and groundwater if oil spill containment measures are not in place.

Disposal The main types of special waste produced are epoxy resins and solid flammable matter. Transformer oil is recycled, or burnt if it contains PCBs. Scrap is used as a secondary raw material.

ENVIRONMENTAL MANAGEMENT

TESSAG's environmental guidelines, which complement the RWE environmental guidelines, apply to all the companies. In order to ensure consistent organization, the companies have anchored responsibility for environmental protection at managerial level, and have defined environment-related responsibilities, processes and operations. Some have already drawn up an organizational manual.

The Piller site in Mechernich is already certified under the international environmental management standard DIN EN ISO 14001, while the site in Osterode has been using a quality management system to DIN EN ISO 9001 since 1994. In mid-1998, SGB approved an organizational directive on occupational safety, health and environmental protection and established appropriate corporate principles in 1999. There are plans to introduce an integrated management system to DIN EN ISO 9001/14001 by June 2002. Maquet is currently drawing up an environmental management system to DIN EN ISO 14001. Environmental protection is an issue which features in the staff suggestions and training systems of all the companies involved. Maquet has appointed a waste officer, while Piller and SGB have site officers responsible for pollution control, water protection and hazardous materials. In the event of an emergency, all the companies have systems to prevent environmental damage. These include major hazard plans, fire fighting water retention basins and site fire brigades.

Compliance with statutory provisions at Piller is ensured through audits and site inspections. In addition, regular safety training sessions are run by external professionals at the Mechernich site. SGB has been inspected and recognized by the German Technical Inspection Organization (TÜV) as a technical plant under §19l of the Federal Water Resources Management Act (Wasserhaushaltsgesetz).

PRUCHASING AND LOGISTICS

Since consistent environmental protection begins with purchasing, SGB and Piller take account of environmental criteria when selecting their suppliers. SGB is currently investigating the use of water-based paints to reduce its solvent emissions. However, Maquet has found that powder coatings are not sufficiently hard-wearing for hospital use, and is therefore forced to continue using paints containing solvents. In order to reduce packaging, the companies use reusable pallets and transport racks wherever possible for deliveries within Germany.

PRODUCTION UND PRODUCTS

In order to ensure environmentally sound production, all the companies have instructions in place for operations that can have an impact on the environment. Innovative measures also serve to minimize environmental effects. For example, SGB has managed to considerably reduce the common problem of paint wastage, known as overspray, by introducing an electrostatic process to one of its production areas. Cutting and punching units have been encapsulated to protect staff from noise. At Piller, machinery oil is processed directly at the plant by means of a transportable filter unit. In order to reduce waste, the company has changed from single use silicon cartridges to reusable ones. Materials containing PCBs have not been used since 1999. At the Osterode site, diesel forklifts have been replaced by electric vehicles. Energy savings of 5% were made in 1999, thanks to repairs to and improved insulation of workshop roofs.

Ecological factors are also given increasing consideration in product development. Piller now applies halogen-free cables and dry transformers. Maquet has largely switched to CFC-free alternatives. The cushions on its operating tables are now foamed using n-pentane, a pure hydrocarbon, and recycled paper is now used in place of polyurethane foam for insulation in wall components.

SGB, Piller and Maquet all have waste management concepts. The main components of waste are paint residues, paint sludge, scrap steel and metal, waste paper, coolants and used transformer oil.

COMMUNICATION

In order to keep their staff informed of environmental issues, SGB and Piller run training courses. They produce brochures informing their customers about the environmental effects of their products. Piller also runs seminars to inform its customers, and advises them about returning lead and steel storage batteries for recycling by the company. Both SGB and Piller in Mechernich organize open days when the public can visit their sites. Maquet has set up an international exhibition and training center for doctors and medical staff in conjunction with the Surgical Academy in Rastatt. Representatives of all the companies are active in external environmental bodies.

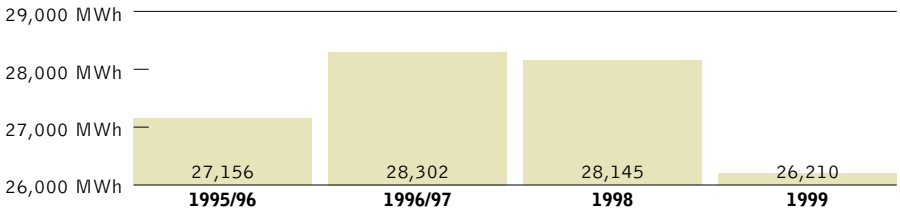
SOCIAL ASPECTS

Maquet and Piller offer their staff flexible working hours and the possibility of working part-time. In 1999, severely handicapped employees accounted for 4.6% (Maquet), 2.3% (Piller) and 1.7% (SGB) of the workforce. Maquet finances grants for Chinese students of medicine, while SGB makes regular donations to the University of Regensburg and awards production contracts worth around DM 250,000 to severely handicapped workshops each year.

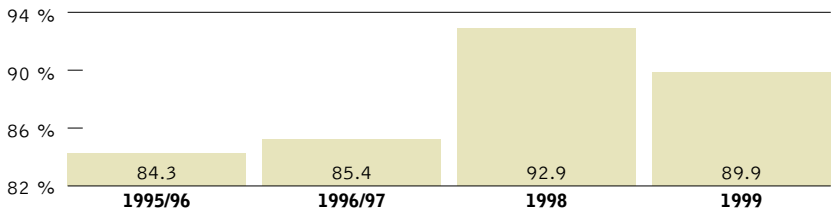
	Unit	Fisical year		Calendar year	
		1995/96	1996/97	1998	1999
INPUT					
Energy					
Natural gas	1,000 m³	2,655	3,011	4,098	4,055
Electricity	MWh	27,156	28,302	28,145	26,210
Oil	t	1,332	1,180	968	772
Fuels	1,000 l	263	87	98	98
Heat	MWh			516	460
Water	1,000 m³	53	67	68	48
Own generating	1,000 m³	13.7	11.2	20.0	10.0
Other sources	1,000 m³	39.5	55.9	48.0	38.0
Raw materials					
Steel, iron	t			24,383	28,097
Non-ferrous metals	t			5,157	5,784
Other	t			5,070	4,925
Consumables and supplies					
Paints	t			312.4	347.4
Trichlorethylene	t	3.4	2.0	1.8	1.8
Solvents	t			75.2	76.2
Acids, lyes, salts	t			28.0	32.0
Coolants	t			14.0	15.0
Other	t			28.0	29.0
OUTPUT					
Products					
Machines, equipment	t			47,302	47,342
Emissions					
VOC	t			94.4	94.6
Waste					
for recycling	t	5,306	5,110	7,696	4,942
of which in need of particular monitoring	t			343	421
for disposal	t	988	877	593	558
of which in need of particular monitoring	t			85	65
Waste water	1,000 m³		67.1	68.1	48.4

Commentary Since the data given for 1996/97 in the 1998 environmental report was projected, it had to be revised. Because of new statutory provisions, VOC emissions (volatile organic hydrocarbons) were included as an additional figure in the data. Data is no longer provided for emissions of trichloroethylene, since there is no basis for calculating values. Because of the new basis for calculating data on the paints used, the figures for 1996/97 are not comparable and are therefore not listed. Due to a change from one IT system to another, no figures are available for Maquet for 1999. The figures from 1998 have therefore been used.
In 1999, power consumption was 7 % lower than in 1998, partly because of a slight fall in production. The volume of waste water fell by around 28% between 1997 and 1999 thanks to the increased use of recirculation systems in production. The subsequent rise is due to the failure of a cooling unit, which lasted two months. The increased volume of waste in 1998 was mainly due to the 2,060 metric tons of contaminated soil from SGB, which was a one-off occurrence.

Power consumption



Proportion recycled



Plant enineering and consulting.

The environmental effects of plant engineering and consulting activities are relatively small, so this report does not contain any data on them. Three TESSAG companies feature in this report by way of example.

The former Starkstrom-Anlagen-Gesellschaft mbH (SAG), Frankfurt, now comprises SAG Netztechnik GmbH, TESSAG SAG Hochspannungstechnik, TESSAG Kraftwerks- und Industrieanlagentechnik and SAG Abel-Kommunikationstechnik GmbH & Co. KG. These companies in Germany together employ some 4,700 staff and have around 100 branches. Their services fall into the areas of electrical installation, power lines, telecommunications systems and communications technology.

The main area of activity of Rheinelektra Technik GmbH, Mannheim, which employs around 2,000 people at its four main branches in Germany, is planning, installing, maintaining and operating the complete electrical infrastructure of buildings and providing buildings management services. The company makes a decisive contribution to reducing energy consumption by installing energy-optimized equipment.

Lahmeyer International GmbH, Bad Vilbel, employs around 650 people and offers a wide range of planning and consulting services in the areas of energy, water, construction and transport. The subsidiary ERM Lahmeyer International GmbH complements this portfolio by offering environmental protection and environmental management services. It helps newly industrialized and developing countries to improve environmental protection through international projects.

The environmentally relevant aspects of these activities are mainly the waste generated during installation and maintenance work, such as pieces of cable and electronic components. Other factors include energy, water and paper consumption at company sites.

ENVIRONMENTAL ACTIVITIES

In the SAG companies which have drawn up their own environmental guidelines, responsibility for environmental protection is anchored at managerial level. There are plant instructions for the use of hazardous substances. Environmental issues are covered regularly by SAG environmental protection seminars, and officers for safety, radiation protection and hazardous goods have been appointed. Compliance with statutory provisions in the various divisions of the SAG companies and Rheinelektra Technik is ensured by SCC certification (Safety Certificate Contractors), which involves annual inspections and has to be renewed every three years. At the beginning of the year 2000, Rheinelektra Technik introduced an integrated management system setting out responsibilities, processes and tasks in environmental protection. All staff are kept informed of this via the intranet. Managers in the company have attended training seminars on safety, health and environmental protection. Lahmeyer International has defined environmental tasks in its quality management manual in the form of procedural instructions. These tasks include the procurement of more environmentally friendly products, the use of recycled paper and the sorting of waste.

Representatives of ERM Lahmeyer International are members of the Working Party on Environmental Protection of the chambers of industry and commerce, and are active in the World Business Council for Sustainable Development as part of their consulting activities.

The NUKEM-Group.

Alongside NUKEM GmbH, the NUKEM Group includes the companies NUKEM Nuklear GmbH, TESSAG Ina GmbH and TESSAG Edeleanu GmbH, whose focus is on engineering planning and plant engineering in a wide range of areas. These include nuclear technology, pulp and paper, chemicals, steel, infrastructure and petroleum oil. NUSYS Telematic GmbH develops telematics systems for transport. A total of around 1,000 people are employed by the companies of the NUKEM Group in Germany.

TESSAG ASE employs some 245 people at three sites in Germany, and produces solar cells, modules and systems for terrestrial and space applications. It ranks in seventh place in the world in this field (> further information is available on the Internet at www.ase-international.com). An interesting factor is the use of solar energy to generate electricity. Although this mainly takes place in southerly latitudes, ASE also uses façade and roof-integrated solar systems in Germany to save on resources. The environmentally relevant activities involved in the manufacture of solar cells are the etching and cleaning of pure silicon discs (wafers), the application of coatings and the cleaning of equipment. The main factors are air and waste water pollution and the generation of waste. The activities of NUKEM Hanau GmbH, which employs a staff of 18, involve the decommissioning of the disused NUKEM-A fuel element factory. This work is being planned and implemented in a process of close cooperation with the authorities and the involvement of the general public. The environmental effects have been investigated, assessed and – where possible – reduced as part of an approvals process under legislation relating to nuclear power plants and an environmental impact assessment. The demolition of the building and the remediation work is scheduled to begin in the fall of 2000. So far, clean-up work has yielded around 70 metric tons of low radioactive waste.

ENVIRONMENTAL MANAGEMENT

The tasks and processes involved in environmental protection are set out in the organizational manual of the NUKEM Group. A central environmental officer has been appointed to coordinate and control activities, and an in-house environmental information system has been developed. At ASE, which is currently drawing up an environmental management system in accordance with ISO 14001, an in-house project team is looking into

environmental issues. All the companies in the Group have integrated environmental protection into their in-house suggestion systems. For example, staff suggestions at ASE led to the consumption of technical gases being reduced, saving DM 26,000 DM per year.

Various provisions, such as the directives on residue and waste disposal, ensure that activities which can affect the environment are performed in an organized manner. NUKEM GmbH and all its subsidiaries have appointed a safety engineer. ASE, NUKEM Nuklear and NUKEM Hanau have also appointed safety advisors, and several radiation protection officers oversee the activities of NUKEM Nuklear and NUKEM Hanau. All the sites have fire alarm systems and extinguishing equipment to protect against fire. The organizational procedures to be followed in the event of an emergency are set out in alarm plans. The Group's environmental officers gather and evaluate new statutory provisions and implement them via the appropriate management team where necessary.

The Renewable Energies Act, which came into force in Germany on 1 April 2000, gives ASE GmbH fresh impetus and planning security in its position as Germany's biggest manufacturer of solar cells. The aim of the new act passed by the German government is to double the proportion of power generated from renewable resources in Germany by the year 2010. It regulates the purchase of and payment for power from regenerative sources by electricity supply companies. Operators of photovoltaic plants will receive 99 pfennigs for each kilowatt hour they generate over a 20 year period. If they do not set up their plant until the year 2002, they will still receive 94 pfennigs per kilowatt hour. This assistance will continue until Germany achieves an installed output of 350 megawatts (MW) – seven times the figure for 1999. As part of the "100,000 roofs program", more solar plants were approved in the first quarter of the year 2000 alone than in the whole of 1999 (> www.100000daecher.de). With Germany's first major industrial production line for solar cells, which became operational in late summer 1998 in Alzenau, ASE is very well prepared to cope with growing demand. The company has already tackled the installation of a second production line, which means that it can produce solar cells with an output of 13 MW every year.

www.100000daecher.de

ENVIRONMENTAL ACTIVITIES

The central purchasing department of the Group uses a supplier information system listing companies whose quality has been assessed. The only company which produces large volumes of waste is ASE, the sole production company in the NUKEM Group. The company has therefore drawn up a waste management concept with concrete measures for reduction, and gives priority to reusable packaging. In order to involve ASE staff in the active implementation of environmental protection policy, there are appropriate instructions for environmentally relevant production processes which describe the environmental aspects to be taken into account. Thanks to the installation of a water recirculation system last year, 90% of rinsing water at ASE is recycled. This process reduces water and chemical consumption and cuts the volume of waste water produced, leading to savings of around DM 127,000 per year. In developing its products and manufacturing processes, ASE works in close cooperation with the Fraunhofer Institute for Solar Energy Systems in Freiburg.

SOCIAL ASPECTS

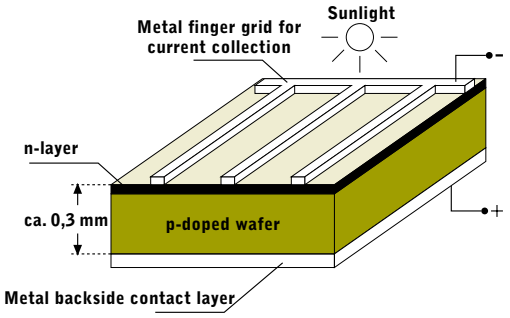
The companies in the NUKEM Group offer their staff flexible working hours. In 1999, the proportion of severely handicapped staff on ASE's payroll was 9.9 %, a figure considerably higher than the average for German companies. ASE is also an active sponsor, and is playing a major role in the "Solar City Alzenau" program. The NUKEM Group also makes donations to schools near its sites.

Field of action: Further development of the energy sector

Goal: ASE's new 13 MW solar cell production line in Alzenau is intended to enhance the company's leading role in this technology and to reduce the cost of terrestrial solar applications. The aim of the "solar route" in Alzenau is to demonstrate a range of photovoltaic applications and encourage builders' clients and architects to use them.

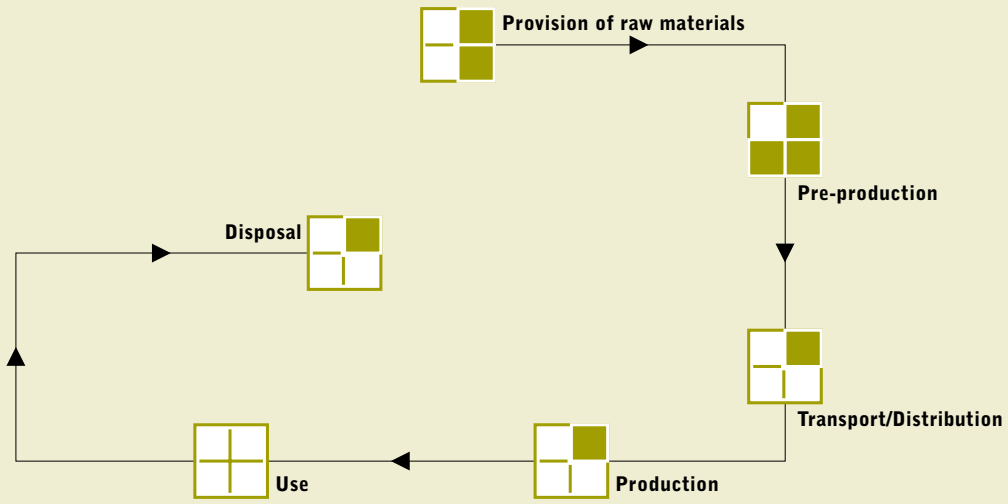
Trigger: The German government is concentrating on regenerative energy sources and has raised awareness of solar power among the general public with the "100,000 roofs program" and the Renewable Energies Act (> p. 113). However, the area of solar energy and the activities of ASE are relatively unknown within the RWE Group.

Cross-section of a solar cell



The project: The "Solar City Alzenau" project is costing DM 2.4 million, and was initiated by the city authorities in conjunction with ASE. The Bavarian Ministry of Economics, Transport and Technology is covering half the cost. The biggest single object in the project is the communal solar plant on the roof of the construction yard. It is run by the Solarverein Alzenau (Alzenau solar association) and financed by donations from local people and firms. Other companies in the city have also set up photovoltaic plants in the form of awnings and shades, and operate them as contractual partners to the local energy supply company. Solar cells are being integrated into the façades of kindergartens and schools, and the solar electricity they generate is used to power lighting at bus stops and street lamps. Photovoltaic plants with a total nominal output of 100 kilowatts have been installed as part of the project.

Benefit for sustainable development: The new "solar route" comprises an area of 1,000 square meters of solar cells, and covers the annual power requirements of 100 people. It therefore reduces CO_2 output by around 80 metric tons per year. The support provided for this future-oriented technology by the Alzenau city authorities has already led to the creation of 60 new jobs at ASE. New jobs are also be created in supplier companies in the region.



very high relevance | high relevance | medium relevance | low relevance | no relevance | not applicable

Provision of raw materials The main environmental aspect is the mining of raw materials to extract aluminum.

Pre-production The production of pure silicon, aluminum and glass is a very energy-intensive process which causes air emissions.

Transport/Distribution Transport by truck and ship generates air pollutants and noise.

Production The process of cleaning, doping and treating the silicon cells in an etching bath and firing the contacts involves the use of hazardous substances and the consumption of energy.

Use Solar cells generate energy in an environmentally friendly manner.

Disposal The materials are largely inert and can be dumped and recycled without any problems.

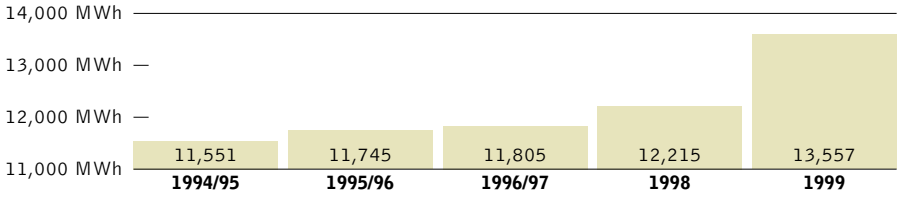
ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
TESSAG subsidiaries			
Improving environmental management			
▪ Introduction of an integrated management system to DIN EN ISO 9001 and DIN EN ISO 14001 (ERM Lahmeyer International).	by 12/1998	complete	Certification 12/1998
▪ Development of ecological criteria for procurement (NUKEM Group).	by 1999	complete	Transfer to TESSAG
▪ Integration of the issue of environmental protection into staff training (NUKEM Group).	by 1999	complete	Transfer to TESSAG
▪ Development of an environmental management system to DIN EN ISO 14001 (ASE).	by 12/1999	8/2000	in progress
▪ Inclusion of contractual partners in the environmental management system (ASE).	by 12/1999	12/2001	from 08/2000
▪ Certification of all sites in Germany to DIN EN ISO 14001 (ASE).	12/2001		
▪ Formulation of environmental guidelines and derivation of appropriate objectives (Maquet).	by 1999	6/2001	delayed by development of an integrated management system.
▪ Development of an organizational system for environmental protection (Maquet).	by 1999	6/2001	
▪ Development of environment-focused procurement guidelines (Maquet).	by 1999	6/2001	
▪ Certification to DIN EN ISO 14001 (Maquet).	6/2001		
▪ Introduction of an integrated management system to DIN EN ISO 9001/14001 (SGB).	6/2002		
▪ Inclusion of all TESSAG subsidiaries in the environmental management and environmental information system (UBIS) of RWE.	12/2000		
Reduction energy consumption			
▪ Optimization of the hardening process (SGB).	continuous	complete	
▪ Reduction of heating energy requirements (Piller and Maquet).	continuous	partly completed	Approx. 5 % less heating energy consumption at Piller, Osterode, thanks to repairs to workshop roofs.
▪ Avoidance of peaks in power consumption (Piller and Maquet).	continuous	continuous	
▪ Reduction of power consumption by 5 to 10% (ASE, Alzenau).	12/2001		
Reduction emissions			
▪ Extension of the use of water-based paints (SGB).	continuous	being tested	
▪ Avoidance of CFC emissions by further substituting PUR insulating materials (Maquet).	continuous	complete	No more use of CFCs.
▪ Reduction of gaseous emissions through catalytic afterburning (Piller, Osterode).	12/2000	complete	Replacement of thermal afterburning.
Reducing water consumption			
▪ Introduction of water-saving recirculation processes (Maquet).	continuous	complete	Water savings of around 30 %.
Saving raw materials, auxiliary substances and operating materials			
▪ Reduction of consumption of resin hardener by optimizing the rinsing process (SGB).	continuous	complete	
▪ Avoidance of pickling agents through use of pyrolysis with exhaust gas cleansing (SGB).	continuous	complete	
▪ Save on packaging materials by switching to reusable packaging.	continuous		
Reducing waste			
▪ Development of a waste management concept (Maquet).	12/1998	complete	

	Unit	Fiscal year			Calendar year	
		1994/95	1995/96	1996/97	1998	1999
INPUT						
Energy						
Natural gas	1,000 m³	924	813	798	934	924
Electricity	MWh	11,551	11,745	11,805	12,215	13,557
Oil	t	252	252	252	250	250
Fuels	1,000 l				21	19
Water	1,000 m³	54.8	56.7	60.8	71.0	69.0
Raw materials						
Acids	t	40.3	44.3	47.3	67.0	64.0
Glass, silicon	t				90.0	120.0
Plastics	t				5.0	5.0
OUTPUT						
Products						
Solar cells	MW	2.3	2.3	2.6	2.7	4.4
Waste						
for recycling*	t	103	122	102	94	105
for disposal	t	42	44	47	62	64
of which in need of particular monitoring	t				3	3
Waste water	1,000 m³	49.8	51.9	54.6	63.2	60.2
Cooling water	1,000 m³	3.6	3.4	4.2	4.0	0.0

* no waste requiring particular monitoring

Commentary The data covers the NUKEM Group without NUKEM Hanau GmbH. NUKEM Alzenau and INA-Duisburg were included in the data for the first time in 1998/99, and the data from before 1998 has been adjusted accordingly. The new production line of TESSAG ASE became operational in late summer 1998.

Power consumption



Preserving the Natural Balance.

The core competence of HOCHTIEF is to be found in the field of developing, building and operating. Around 37,000 employees worldwide, around 14,000 of them in Germany, are involved in the implementation of building construction and civil engineering projects.

These include residential buildings, corporate structures[1], industrial structures, tunnel and bridge building, conventional and atomic power stations, road and airport construction. If necessary, HOCHTIEF will also take care of the planning, finance and operation of the buildings. Environmental impact projects are also included, such as petrol stations, sewage treatment plants, landfill sites, canals, power stations, dams and other installations which require approval. By expanding the extent of its construction related services, the airport division is being further developed. HOCHTIEF AirPort obtains airport concessions and shareholdings.

The company is organised into market and product orientated units: The backbone of the operational business are the divisions HOCHTIEF AirPort, HOCHTIEF Building[2], HOCHTIEF Civil[3], HOCHTIEF Development[4], HOCHTIEF North America, the intermediate holding HOCHTIEF International and the service unit HOCHTIEF Services[5].

1) Office buildings, commercial buildings, shopping centres, trade fair buildings, railway stations, etc.
2) Also including Prefabricated Element Constructions
3) Civil engineering branches, Transport related Construction, Environment
4) Also including Project Development, Facility Management, Corporate Real Estate Management
5) Streif Construction Logistics, Software

Specialized know-how is concentrated in national competence centres, such as HOCHTIEF Environment, which also deals with the remediation of contaminated areas, rezoning and demolition of industrial plant. Further information about our business activities is available on our website (> www.hochtief.de).

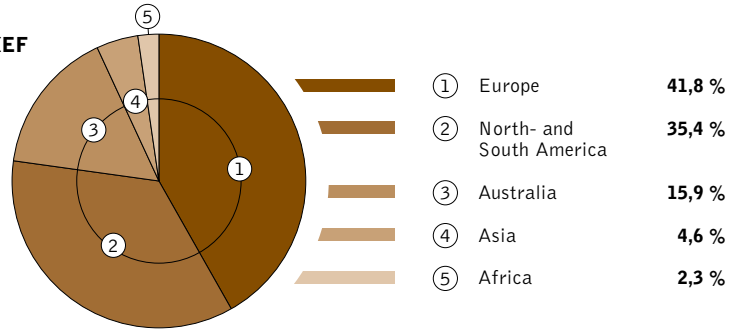
Every project has an environmental impact. This includes land use, excavation as well as, in some cases, intervention in the water regime by lowering the groundwater level or by the diversion of water courses. Additional environmental aspects of this work include the consumption of energy, water and raw materials as well as the generation of noise, vibrations, emissions, effluent and refuse. In all the work carried out by HOCHTIEF, such effects are reduced to the absolute minimum (Germany's Federal Environmental Agency has issued a survey on "Building and living, material flows and requirements", which can be obtained via their website www.umweltbundesamt.de).

Of particular importance where environmental protection is concerned, is the work carried out by HOCHTIEF in contaminated areas, restricted catchment areas as well as in groundwater and radiation protection areas, the use of mechanical roughening processes in road construction as well as the remediation of waste disposal and hazardous waste disposal sites. In addition, HOCHTIEF operates a number of environmentally relevant facilities itself, such as cleaning and lacquering plants, two microbiological and one thermal soil treatment plant, all three of which are approved in accordance with the Federal Pollution Control Act (BImSchG), ready mixed concrete and pre-cast concrete element factories as well as timber-fuelled captive thermal power plants.

ENVIRONMENTAL MANAGEMENT

The basic objectives, such as the protection of resources, have been specified at the highest managerial level at HOCHTIEF, in addition to which the environmental model of RWE AG applies. Since 1999, a statement in the "Vision and Guidelines" chapter of the Management Manual, supplements the principles laid down in the chapter on "Environmental Protection". Specific environmental objectives that have been set up for the individual Corporate Units, should continuously improve the level of environmental protection at HOCHTIEF.

Performance of HOCHTIEF by regions



Overall responsibility for environmental protection is borne by the Executive Board, which has delegated responsibility for the environment to a Member of the Board. The responsibilities and competencies are defined in the Management Manual for all environmental tasks, which can also be reviewed by employees via the Intranet. To ensure that the statutory obligations are complied with, the Corporate Units have prepared work procedures on the following topics, in line with their individual requirements:

- Environmental protection,
- Organisation of environmental protection,
- Handling of hazardous substances,
- Transportation of hazardous goods ,
- Working in contaminated areas,
- Waste management.

Since 1999, the management systems established at HOCHTIEF for safety, health and environmental protection can be certified according to the SCC checklist (Safety Certificate Contractors). This has already been implemented by the following Corporate Units: HOCHTIEF Transport related Construction, (Helmus Straßenbaugesellschaft mbH), Civil Engineering Branch Rhine-Ruhr, HOCHTIEF Environment and the Halle-Leipzig Branch. In addition, HOCHTIEF Environment is also approved as a specialist waste disposal company.

The Environmental Officer of the company reports directly to the Member of the Board responsible for the environment. The Corporate Units have appointed their own Environmental and Hazardous Goods Officers. In addition, HOCHTIEF Environment has appointed a Waste Management Officer and an Emissions Control Officer. Apart from advising the construction project teams, the main responsibilities of the Environmental Officers are to ensure compliance with the statutory reporting obligations as well as to prepare waste control concepts. In addition, they train the employees, including the foremen and site manager, who deal with environmentally relevant tasks. To actively include as many employees as possible in environmental protection, it is integrated in the company suggestions scheme and also forms part of the corporate training programme. The Environmental Officers of the Corporate Headquarters and the Units meet on a quarterly basis for discussions.

RISK MANAGEMENT AND INDUSTRIAL SAFETY

In order to prevent operational incidents with environmental impact, instructions for the handling of hazardous

materials, equipment and facilities, as well as well as on working in facilities that are approved under the Federal Pollution Control Act (BImSchG) are available. In construction projects measures for the protection of soil and groundwater are taken during the handling of potential contaminants. These measures include the use of oil separators, oil basins and oil containers. In addition, a Senior Safety Engineer is active in each Corporate Unit, who monitors the pertinent procedures and holds training courses.

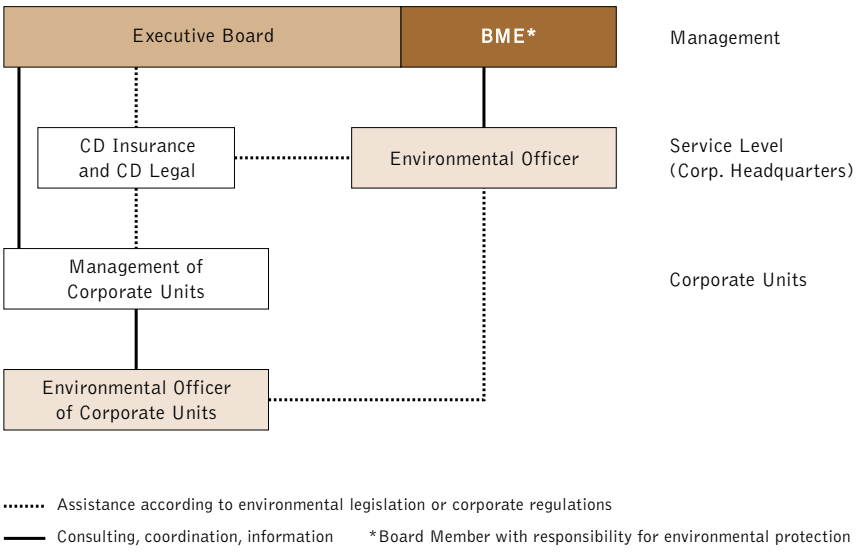
Audits are carried out to verify compliance with the environmental protection and occupational safety requirements. Deviations, in particular from the statutory regulations, are documented and the appropriate remedial procedures are then agreed upon with the project team. Accidents are registered in line with the Industrial Safety Act (Arbeitsschutzgesetz). When environmental pollution occurs, the project team reports immediately to the Environmental Officer, the management of the pertinent Corporate Unit as well as to the Environmental Officer of the company. The occurrence is reported to the Member of the Board responsible for environmental protection, where third parties are endangered, legal proceedings are initiated, an insured loss occurs or where the public image of the company is at risk.

When assessing property investments, environmental risks arising from inherited environmental liabilities are recorded and contractually dealt with. For our own properties, potential hazards are identified as part of the Corporate Real Estate Management (CREM), and the relevant authorities are involved in the planning and remediation work from an early stage.

ENVIRONMENTAL PROTECTION OF PROJECTS

For construction projects, HOCHTIEF takes care to ensure an environmentally safe construction method and environmentally compatible building technology. One example of this is an administration building constructed in Munich by HOCHTIEF: Instead of an air-conditioning facility, a tubular system was fitted as a cooling floor, which cools when the ambient temperature is high, using the opposite principle of a tiled stove. For the construction of the RWE-Headquarters in Essen, HOCHTIEF was honoured with the Property Award in 1998, the reason being that the office tower combines in a special way architectural, innovative, economic and ecological aspects. A complex building engineering system thus controls and optimises the cooling, heating and ventilation. For example, when the windows are opened, the cooling switches off automatically.

ENVIRONMENTAL PROTECTION ORGANIZATION OF HOCHTIEF AG



As part of the research and development project "Low Energy Gymnasium", HOCHTIEF now intends to develop an overall concept for multiple use in a system design taking into account designing,building, financing and operation. By means of a low energy solution, possibly linked with the use of regenerative energy sources, the power consumption and thus the associated emissions are to be noticeably reduced. The "Passive house" project, is a further development of the low energy house, which is to become the standard in the trade in future. A conventional heating system and the pertinent supply of gas or district heating would then no longer be required. At the beginning of the year 2000, a project was agreed upon on the topic "Environmental Compatibility of Building Materials" as a continuation of the project "Environmentally Suitable Building Materials in the Construction of Turnkey Office Buildings" and "Healthy Building Materials in Construction". The objective is the systematic development of a constantly available consulting scheme about environmental and health compatible building materials for all operational units of HOCHTIEF.

To save on raw materials, HOCHTIEF uses recycled old building materials, which are obtained from demolished structures. Various Corporate Units have prepared disposal concepts, partly also for individual projects. For its pilot project on waste management concepts, in 1998, the Berlin branch received the Environmental Prize of the Federal Association of German Industry (BDI). A process for ground management was developed during the expansion of Düsseldorf International Airport by Flughafen Düsseldorf GmbH, in which HOCHTIEF AirPort has a holding, that should contribute towards the safeguarding of resources by means of materials management recycling: By means of precise initial surveys, the polluted areas within the airport site are determined. The soil excavated during the construction work, is graded by an independent expert according to predetermined data. Where possible, the produced excavated soil, that is graded as being innocuous, is used for new construction projects at the site. Due to the detailed documentation kept by Flughafen Düsseldorf GmbH, the transfer of pollutants into the groundwater is avoided.

COMMUNICATION

At HOCHTIEF, training courses and working groups promote an exchange of information beyond the boundaries of the organisational units. During negotiations and discussions, clients obtain an insight into the environmental activities. The subcontractors, who are involved in

HOCHTIEF projects, are consistently incorporated in the project related environmental concepts.

To further develop environmental protection, HOCHTIEF Environment works together with the Federal German Ministry for Education, Science, Research and Technology on a research and development project concerning construction material recycling and solid construction (> www.b-i-m.de/Struktur/ueberbim.htm). The participation by HOCHTIEF employees in company transcending working groups and initiatives by the construction industry, helps to strengthen environmental know-how and find common solutions. The Environmental Officer of HOCHTIEF Environment is also active as the Chairman of the Monitoring Committee of the Entsorgergemeinschaft Bauen und Umwelt e.V.

SOCIAL ASPECTS

At HOCHTIEF, semi-retirement is possible, and some Corporate Units also offer flexitime models or part-time working. In addition, the possibility for young mothers to work from home has already been tried and positively received in two trials. The ratio of disabled workers employed at HOCHTIEF is low. This is typical for this industry. In 1999 it was 1.3 per cent.

Cultural projects to do with the "Bauhaus", the artistic and architectural movement of the 1920s, originating in Weimar, is supported by HOCHTIEF as part of the 125th company anniversary. For the completely original reinstatement of the semi-detached house, in which the artists Wassily Kandinsky and Paul Klee lived in Dessau, the company donated one million DM and took on overall responsibility for the building work as general contractor (> www.meisterhaeuser.de). In addition, HOCHTIEF was one of the sponsors of the "URBAN 21" conference that was held in Berlin in July 2000. The event should strengthen the international awareness of the sustained development of the cities, which was initiated during the Rio Conference 1992 and HABITAT II, the world settlement conference.

On March 16, 2000, HOCHTIEF contractually engaged to observe the worldwide social standards of the International Labour Organization (ILO) in its construction projects. HOCHTIEF`s subcontractors are also obliged to comply with this agreement. They employ a multiple of the 37,000 HOCHTIEF employees worldwide. The contractual partners of the Executive Board and the General Works Council of HOCHTIEF are the German Building-Agricultural-Environmental Trades Union (IG Bau) and the International Federation of Building and Wood Workers (IBBH). HOCHTIEF is the first international construction corporation, that has signed such an agreement with the international trade union. In future, a so-called Code of Conduct will apply at HOCHTIEF and its contractual partners. The minimum conditions specified in this code read as follows:

– employment must be freely chosen,
– there is no discrimination where employment is concerned,
– no use is made of child labour,
– the right to freedom of association and free collective bargaining is respected
– adequate wages and salaries must be paid,
– working time must be unreasonable,
– working conditions must be decent and
– conditions of employment must be established.

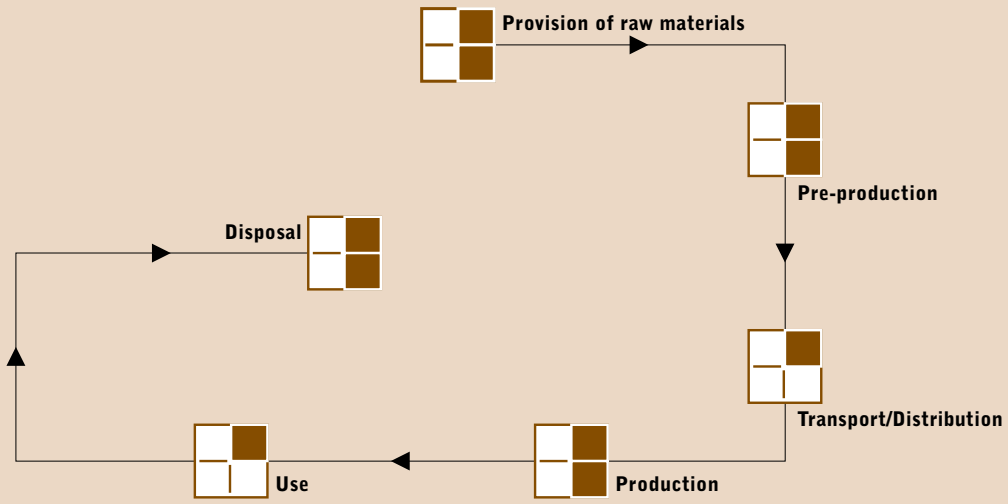
Field of action: Ensuring a stable economic development through long-term planning.

Goal: With the Airport Management business field, in addition to the core competence of building, HOCHTIEF intends to develop a second mainstay so as to ensure its long-term existence in the market and the continued growth of the company.

Trigger: Whilst project orientated construction is subject to considerable fluctuations in turnover and profit, airports achieve stable returns at a higher level. At the same time, the number of passengers is continuously increasing by an annual figure of around five percent. Since the public purse lacks the finance, private investors are playing an ever increasing part. Accordingly of the 530 most important airports, around 150 will be reliant on private investment in the years to come.

The project: Over the past 40 years, HOCHTIEF has planned and built airports worldwide. A turning point in 1990 was Warsaw Airport, which HOCHTIEF built on a turnkey basis, which included arrangement of the complete financial package for the very first time. The involvement in Athens Airport provided the final reason for engaging in airport management. Established in 1997, HOCHTIEF AirPort obtains worldwide airport holdings and offers all services to do with the planning, finance and management of airport projects. At present, HOCHTIEF AirPort has stakes in two airport companies: Flughafen Düsseldorf GmbH and Athens International Airport S.A. As the airport manager, the company coordinates the services of all those involved in the development and operation: Airport operators, airline companies, passengers and visitors, employees, air navigation services, concessionarres, building and property developers, travel agencies, freight companies, retailers and catering. The acquisition of additional holdings is planned.

Benefit for sustainable development: Benifit for sustainable development: With its manifold services, HOCHTIEF AirPort continuously raises the value of the participating interests. The airport locations and thus also the work-places are secured in the long term, whilst the new business field creates additional possibilities for employment within the company itself.



very high relevance | high relevance | medium relevance | low relevance | no relevance | not applicable

Provision of raw materials The quarrying of gravel, sand and limestone, etc., has a negative effect on the natural landscape and requires energy. Restoration once quarrying has finished, reinstates the landscape.

Pre-production The manufacture of building materials consumes energy and causes emissions and waste.

Transport/Distribution Air pollutants and noise are produced during transportation by lorries.

Production Construction methods and the processing of building materials produce noise emissions and release air pollutants during construction. Other effects on the environment are caused by the refuse and the amount of land used.

Use Use of the building requires a high amount of energy for heating, cooling and lighting.

Disposal During demolition large quantities of rubble are produced. In addition, there is the noise and dust. The amount of waste can be reduced by recycling the rubble.

ENVIRONMENTAL PROGRAM	DEADLINE	PROGRESS	COMMENTS
Improving Environmental Management			
▪ Stocktake in the corporate units and evaluation	12/1998	complete	
▪ Developing a structured environmental protection organisation.	12/1998	complete	Results were taken into account during the constant revision of the Management Manual.
▪ Collection of environmentally relevant data in the Finance and Accounting departments	12/2000	complete	New cost types were set up.
Procurement and Use of Environmentally Compatible Construction Materials			
▪ Implementing the findings from the research and development project "Environmentally Compatible Products in the Construction of Turnkey Office Buildings" completed in 1997.	12/2000	continuous	A follow-on project was approved in January 2000.
▪ Carrying out the research and development project "Environmentally Compatible Building Materials".	12/2001		
Energy Efficiency and Reduction in CO_2 Emissions			
▪ Implementing the findings from the research and development projects: – Ventilation and energy efficiency in industrial and factory buildings, – Use of energy in buildings through heat recovery, – Energy recovery and energy storage.	12/2000	The projects "Use of Energy in Buildings through Heat Recovery" as well as "Energy Recovery and Energy storage" are in the technical preparatory phase.	The project "Ventilation and Energy Efficiency in Industrial and Factory Buildings" showed that the system produces a considerable saving in energy and an improvement in the industrial medicine data.
Saving raw materials			
▪ Carrying out a research and development project to optimise the processes during demolition work (building materials recycling for solid construction): – Environmental compatibility investigations on demolition methods, – Data acquisition and evaluations to determine parameters.	12/2000	A manual has been produced on the acquisition and evaluation of the materials.	Using the parameters compiled in a database, precise building material quantities can be determined in the demolition plan and the recycling ratio of the building materials can be optimised.
▪ Carrying out a research and development project on hollow reinforced concrete floors as a continuous improvement process.	12/2000	Test slabs were made and tested at Kassel University.	The test results were positive.
Reduction the Amount of Waste			
▪ Drawing up a waste balance sheet using uniform software.	12/1998	complete	In Berlin, the concept is used on all projects that exceed a contract value of DM 30 million.
▪ Integrating the waste disposal system in the construction sequence by transferring the experience from pilot projects to new projects.	12/2000	complete	
Prevention of Noise Emissions			
▪ Use of low noise vibration technology for the compaction of concrete (HOCHTIEF Prefabricated Element Construction).	by 2000	continuous	In the coming years, all five prefabrication factories will replace the old up-and-over benches with low noise up-and-over benches.

	Unit	Calendar year		
		1997*	1998	1999
INPUT				
Energy				
Electricity	MWh	60,650	116,900	126,968
Heating Fuel Oil	t		5,696	6,117
Natural Gas	1,000 Nm^3		7,115	7,517
Wastes for Re-use	t		93,895	88,785
Motor Fuels	1,000 l		22,801	21,872
Water	1,000 m^3	1,511	1,002	1,089
Raw Materials				
Timber/Form-work Boards	m^3	81,479	35,273	32,597
Concrete Steel	t	118,126	91,364	90,160
Reinforcement Steel	t	8,357	5,866	7,083
Concrete, Sand, Gravel	m^3	1,521,567	1,596,552	1,844,020
OUTPUT				
Emissions				
Wastes for Re-use	t	82,769	75,566	88,720
Construction Rubble	t	52,095	52,045	51,720
Road Demolition	t	8,969	6,773	11,500
Iron Scrap	t	2,869	3,448	2,500
Commercial Wastes, similar to Domestric	t	5,941	1,885	9,500
Structural and Old Timber	t	12,895	11,415	13,500
Waste for Removal	t	29,379	34,114	87,120
Construction Site Wastes	t	25,675	30,094	62,600
Contaminated Soil	t	586	418	19,350
Slag grom Concrete Production	t	2,106	1,292	900
Asbestos Cement	t	1,012	0	770
Other Wastes for Removal	t		2,310	3,500

* For the reporting period, no further details could be given.

Commentary The input data was determined by means of the cost types using average prices. Separate cost types were set up for the energy obtained (power, water, light fuel oil, diesel and natural gas) with effect from January 1, 1999. Due to the changeover in 1999, the data could only be partly recorded separately. For this reason, the quantities for the years 1998 and 1999 were computed using the percentage share of this separately acquired data.
Around 300,000 km were covered by heavy goods traffic in 1998 and 1999, for which around 45,000 litres of diesel fuel were required. The precise quantity transported in tonnes per kilometre cannot be determined as yet.

Reports, discussions and promotion.

The present second environmental report is designed to step up the dialog with our target groups. The favorable response to our first report has been encouraging in this respect.

A survey among multipliers from environmental associations, politics, the media and the scientific community revealed that RWE's environmental report was credible to two thirds of the people interviewed and that the amount of information met their requirements. When asked as to which subjects were missing, 50 percent of the people mentioned forward-looking energy supply schemes. With respect to the information on environmental impact, a third of the people interviewed wished a stronger product relation and the provision of indicators. This feedback was taken into account when preparing the present report.

The ranking of German environmental reports carried out every two years by future e. V. – Verein für umweltorientierte Unternehmen together with the institute for ecological economic research and the magazine "Capital" also confirms that we are on the right track with our environmental reporting. The ranking determines the quality of corporate environmental reporting in terms of content and communication quality by way of various individual criteria. In the latest assessment of environmental reports of the 150 largest German companies, RWE's report published in 1998 ranked 16th and thus reached the best position among the conglomerates (www.ranking-umweltberichte.de).

The environmental report is of course not the only way in which we conduct the dialog with our target groups. We inform about our economic, social and environmental activities also by way of regular press releases, the annual report, the personnel report and

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www.ranking-umweltberichte.de

the company magazine "agenda". On the Internet, where the environmental report is published as well, we report on an ongoing basis about new developments. The study on opportunities and risks of future world energy supply, which was prepared by the energy industry working group of the RWE Group, is available as download (> www.rwe.de).

The companies of the individual Group divisions are involved in the work of various bodies to ensure a general exchange of experience and to promote environmental protection. RWE AG itself is a member in the German National Committee of the World Energy Council (DNC), whose publications on energy policy we strongly support, and in the E7 Initiative. RWE is also involved in the work of "Forum Nachhaltige Entwicklung" (Sustainable Development Forum) initiated by Bundesverband der Deutschen Industrie e. V. (BDI) in the spring of 2000.

SOCIAL RESPONSIBILITY

Regionally we are represented first and foremost in Initiativkreis Ruhrgebiet which aims to support the structural change in North Rhine-Westphalia. By way of the series of events "RWE-Sommerakademie" we promote the dialog of young people with representatives from politics, science and our company. The "Dream-Team-Aktion" gives apprentices in our Group the opportunity every two years to address issues from the world of work and society and to put into practice creative solutions in a team with other apprentices. In 1999, some 740 young persons addressed issues of environmental protection, social questions, training, customer focus and innovation in 77 projects. Awards were presented for the best papers.

On the occasion of its 100th anniversary in 1999, RWE created the RWE youth foundation to step up the commitment to sustainable development. It promotes projects which contribute to creating a future worth living in for children and young persons. Examples of this initiative are an educational center for nature and the environment, the integrative meeting place "Regenbogenhaus" of the department for the handicapped in Essen or intercultural student clubs in the federal state of Brandenburg (> www.rwe-jugendstiftung.de).

Open for your Group.

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- RWE Energie Aktiengesellschaft, Essen
- envia Energie Sachsen Brandenburg Aktiengesellschaft, Markkleeberg
- Lech-Elektrizitätswerke Aktiengesellschaft, Augsburg
- Main-Kraftwerke Aktiengesellschaft, Frankfurt/Main

Mining and Raw Materials

- Rheinbraun Aktiengesellschaft, Cologne
- Rheinische Baustoffwerke GmbH (RBS), Bergheim
- Lausitzer Braunkohle Aktiengesellschaft (LAUBAG), Senftenberg

Petroleum and Chemicals

- RWE-DEA Aktiengesellschaft für Mineraloel und Chemie, Hamburg
- CONDEA Chemie GmbH, Hamburg
- DEA Mineraloel Aktiengesellschaft, Hamburg

Environmental Services

- RWE Umwelt Aktiengesellschaft, Essen
- RWE Umwelt Services Deutschland GmbH, Essen
- Trienekens Aktiengesellschaft, Viersen
- RWE Umwelt Aqua GmbH, Berlin

Industrial Systems

- Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg
- TESSAG Technische Systeme & Services Aktiengesellschaft, Frankfurt/Main
- Angewandte Solarenergie – ASE GmbH, Alzenau
- Lahmeyer International GmbH, Bad Vilbel
- ERM Lahmeyer International GmbH, Neu-Isenburg
- MAQUET Aktiengesellschaft, Rastatt
- MAQUET MediKomp GmbH & Co. KG, Rastatt
- orto MAQUET GmbH & Co. KG, Rastatt
- NUKEM GmbH, Alzenau
- NUKEM Nuklear GmbH, Alzenau

- NUKEM Hanau GmbH, Hanau
- NUSYS Telematic Systemhaus GmbH, Alzenau
- NUBEG Beteiligungsgesellschaft mbH, Alzenau
- Piller GmbH, Osterode am Harz
- Piller Komponenten GmbH, Mechernich
- Rheinelektra Technik GmbH, Mannheim
- SAG Netztechnik GmbH, Frankfurt/Main
- SAG Starkstrom-Anlagen-Gesellschaft mbH, Frankfurt/Main
- SAG Abel Kommunikationstechnik GmbH & Co. KG, Engelsberg
- SGB Starkstrom-Gerätebau GmbH, Regensburg
- SGB Maschinen Service GmbH, Regensburg
- Sächs. Bayr. Starkstrom Gerätebau GmbH, Neumark
- TESSAG-Edeleanu GmbH, Alzenau
- TESSAG-Ina GmbH, Duisburg

Construction and Civil Engineering

- HOCHTIEF Aktiengesellschaft, Essen
- HOCHTIEF AirPort GmbH, Essen
- HOCHTIEF Verkehrswegebau GmbH, Vechta
- HOCHTIEF Fertigteilbau GmbH, Frankfurt/Main
- HOCHTIEF Umwelt GmbH, Essen
- HOCHTIEF Projektentwicklung GmbH, Essen
- HOCHTIEF Facility Management GmbH, Frankfurt/Main
- Streif Aktiengesellschaft, Weinsheim
- Prüm-Türenwerk GmbH, Weinsheim
- Streif Baulogistik GmbH, Vettelschoß
- Deutsche Bau- und Siedlungs-Gesellschaft mbH, Frankfurt/Main