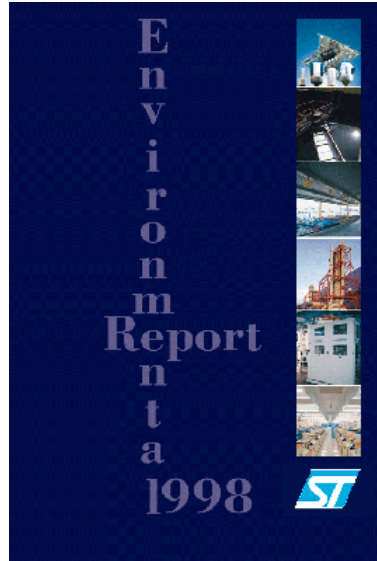




## Corporate Environmental Report



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## Corporate Environmental Report

### Message from the President



Ten years ago, STMicroelectronics established environmental responsibility as a key strategic objective. Since then, the Company has moved from mere compliance with local laws to the global application of the most stringent regulations worldwide and demonstrated proactivity. Our Environmental Decalogue, first published in 1995, established ambitious goals for the main ecological issues, and we set an example by publicly announcing measurable targets to be reached by the end of the decade.

Within the frame of our Total Quality Management (TQM), we have developed teamwork, focused on continuous improvement, empowered our people and made a consistent commitment to achieve the Decalogue goals. Today, at the end of the decade, most of these targets have been reached. At equal production value, we have cut energy and water consumption by 22% and 31% respectively. We have eliminated CFC and there has been a significant reduction in paper and chemicals consumption. All our sites were both EMAS validated and ISO14001 certified by the end of 1997. Moreover, we have promoted environmental awareness in our communities, through our people and business partners.

Today, as we set our objectives for the years 2000-2010, new challenges emerge: besides overpopulation and repartition of wealth, climate change is one of the critical issues now facing the world. Humanly produced greenhouse gases are increasing at an unsustainable rate and, although industry may not be the main contributor to these emissions, we must play our part as good citizens and adapt our manufacturing infrastructure and behaviour.

We have therefore set aggressive targets to reduce the impact of our activities on the atmosphere. Firstly, we will progressively eliminate the perfluorinated compounds (PFC) that contribute to the greenhouse effect. Secondly, through energy conservation, renewable energies and carbon sequestration, we will reduce to zero our net CO<sub>2</sub> emissions by the year 2010.

These goals are much more ambitious than those required by present international protocols and once again demonstrate the Company's proactive approach in its commitment to the Environment.

In a noble and stimulating spirit, we want to show the way by competing with other world class industries to make our world a better place to live in, one that we will be proud to hand over to our children.

Environmental neutrality is our long term goal.

Pasquale Pistorio  
President and Chief Executive Officer

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## Corporate Environmental Report

### STMicroelectronics at a Glance

- STMicroelectronics is a global independent semiconductor company that designs, develops, manufactures and markets a broad range of semiconductor integrated circuits and discrete devices. These are used in a wide variety of microelectronic applications, including telecommunications and computer systems, automotive and consumer products, and industrial automation and control systems.
- The group today has 17 manufacturing sites around the world and over 30,000 employees.
- Corporate headquarters are in the vicinity of the Geneva Cointrin Airport, part in Saint Genis, France and part in Geneva, Switzerland.
- STMicroelectronics has 62 sales offices in 24 countries and offers some 3,000 main types of products to more than 1,500 customers.
- With 9 advanced research and development units, 31 design and application centers, ST possesses an extensive portfolio of intellectual property which includes in excess of 15,000 patents, both issued and pending, covering over 5,000 original inventions.
- The Company is active in numerous collaborative research projects worldwide as well as playing a key role in Europe's advanced technology research programs such as MEDEA.
- ST champions quality and environmental initiatives and in 1997 the Company received the prestigious European Quality Award for Business Excellence, which is given to the best managed company in terms of Total Quality Management principles.
- STMicroelectronics is quoted on the New York Stock Exchange, on the Bourse de Paris and on the Borsa di Milano.

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## Corporate Environmental Report

### Environmental Issues

**In a general, worst case scenario, should all stringent precautionary measures and response plants at manufacturing sites fail, there might be potential hazardous effects on the environment.**

#### ENERGY

- Loss of electrical power with consequent abnormal waste water discharge and air emissions, due to shut down of abatement equipment.
- Indirect contribution to CO2 emissions originated by power plants during energy production, with consequent contribution to the Greenhouse Effect.

#### WATER USE

- Consumption of energy when processing water suitable for our processes.
- Contribution to the depletion of water resources, especially in the sites located in countries with shortage of water.

#### WASTE WATER DISCHARGE

- Potential Impact on people or animals using local well water: on crops irrigated with local ground water; possibility of contaminating surface waters.
- Potential effect on aquatic eutrophication, acidification, biodegradation, ecotoxicity.

#### AIR EMISSION

- Impact on health of people living or working around the site; on crops, livestock, flora and fauna from the accidental release of toxic gases.
- Structural damage caused by accidental emission of corrosive pollutants.
- Contamination of surface waters through settling, formation of smog; impact on buildings around the site.
- Potential Emission of visible smoke and Emission of strong odours.
- Potential contribution to acid rain, global warming, ozone depletion, photochemical pollution.

#### PAPER

- Deforestation.

#### CHEMICAL

- Impact on surface water bodies from sudden discharges of harmful waste water.
- Impact linked to accidental rupture of underground tanks containing chemicals; large spills on unpaved areas; large fires leading to the escape of chemicals or contaminated fire water onto unpaved areas.
- Contribution to Greenhouse Effect by use of Perfluorocompounds (PFC).

#### WASTE

- Potential Impact on people, crops, livestock or other flora and fauna around the site, on water bodies or on soil and ground water due to contaminants present in the site's waste.
- Land consumption and contamination from landfilling practices.

#### NOISE

- Potential Impact on people living or working around the site.

#### PRODUCTS

- Production of electronic waste.
- Consumption of energy/dissipation during the life of the product.

#### MATERIALS

- Consumption of natural resources.

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## Corporate Environmental Report

### Sustainability

Care for the environment is a core element in the business policy of STMicroelectronics and is embodied in the Company's Environmental Vision, Mission and Policy.

### OUR VISION

To be recognized by all our stakeholders as a leader in environmental care by following our Environmental Decalogue and by exceeding regulatory requirements in both degree and timing wherever possible.

### OUR MISSION

To strive for sustainable development in minimizing the impact of our processes and products on the environment by maximizing the use of recyclable or reusable materials and, where possible, adopting renewable sources of energy.

### OUR POLICY

To aim for ambitious continuous improvement of our environmental performance with a view to reducing our impact on the environment to levels which do not exceed those corresponding to the Economically Viable Application of the Best Available Technology (EVABAT).

To take a proactive approach in environmental activities, built on the principles of Total Quality Management (TQM) and guided by the 16 principles of the International Chamber of Commerce (ICC) Business Charter for Sustainable Development.










[See Appendix 1.](#)

To be a world leader in our moral obligation towards the environment making investment in environmental programs a priority, attracting the best young people and motivating all employees in the challenge for a better quality of life.

### GENERAL PRINCIPLES

The Total Quality Management (TQM) approach is a practical way of working and managing all aspects of a business to achieve the best results for all stakeholders. In the environmental context, this policy is termed Total Quality Environmental Management (TQEM).

The objectives are :

-  To ensure Management commitment to a culture of ecology throughout the Company.
-  To design products and processes to minimize their environmental impact from "cradle to grave".
-  To benchmark ST against leading companies the world over, so as to equal or exceed their environmental performance.
-  To apply the most advanced statistical tools (Statistical Process Control, Design of Experiment, Failure Mode Effects Analysis) to processes and products. Apply environmental tools such as Environmental Impact Analysis, Life Cycle Analysis to the environment parameters.
-  To strive for continuous reduction in waste and pollution and in the consumption of water and energy, in a quest for sustainable development.
-  To implement training and education for all employees to ensure that all personnel are empowered to perform the job correctly, and in line with the corporate environmental directives.
-  To inform customers of the correct way to manage ST products throughout their life cycle, with minimum or no effect on the environment.
-  To involve suppliers and contractors in adopting the Environmental Management System (EMS), thus providing goods and services that are environmentally sound.
-  The ST Environmental Policy goes beyond the TQM principle of Customer Satisfaction and aims for Stakeholder Satisfaction through initiatives and programs based on the Company's Decalogue for the Environment.

[See Appendix 2.](#)

### ORGANIZATION

At the highest level, environmental concern is the responsibility of our Total Quality Environmental Management (TQEM) organization, headed by a Corporate Vice-President. The Environment Strategies and International Quality Programs (ES-IQP) organization within this group spearheads the achievement of our vision, mission and policy.

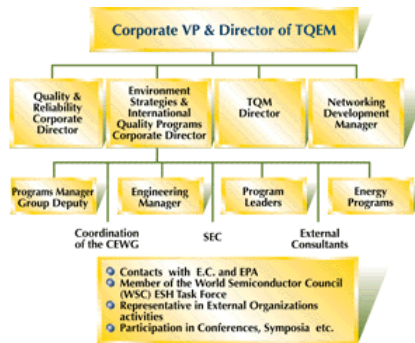
Periodical audits are conducted by the ES-IQP and environmental Standard Operating Procedures and Corporate Specifications are set. Internal training on environmental issues is promoted and plans to meet corporate goals are implemented.

Through leadership and example, the ES-IQP group promotes a Company-wide culture of environmental protection. Appendix 1 shows how ST manages its environmental activities according to the principles of TQM and the ICC Business Charter for Sustainable Development.

The Corporate Environmental Steering Committee (ESC), chaired by our CEO supports all aspects of the Decalogue, including review and resource allocation. At the local level, an Environmental Steering Committee and a Site Environmental Champion (SEC) are active in every environmental initiative. In strengthening the Company image as an environment-conscious corporation, they interface between the Corporate Environment Strategies Group, Site Management (Purchasing, General Services, for instance), as well as with other functions such as R&D and Operations. Regular contact with all regulatory agencies is maintained by these groups.

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**OWNERSHIP OF THE DECALOGUE OBJECTIVES**

A comprehensive structure of Corporate Environmental Working Groups (CEWG) coordinates improvement actions at each site. Innovative solutions and 'best practices' are cascaded throughout the Company, building up expertise and knowledge.

**ENVIRONMENTAL AWARENESS AND TRAINING**

To increase awareness of the environment, both with employees and outside contractors, training is given at each site. This includes:

- an in-depth commentary on the Company's Environmental Policy, the Decalogue and the site Environmental Statement;
- a general overview of the Corporate and Site Environment Manual;
- an explanation of the role and responsibility of each new employee within the site environmental management system;
- a tour of the site's main environmental facilities.

With the support of the Site Environment Champion, local training organizations offer specific courses both for internal and external contractor personnel. For example, design, manufacturing, facilities, maintenance, purchasing, clean room staff, etc. In addition, courses on emergency preparedness and response, including evacuation exercises are also offered. The training is geared towards the control of the specific and significant environmental effects listed in the relevant Site Register.

All personnel operating, supervising, monitoring or maintaining environmental equipment such as waste water treatment equipment, scrubbers, chemical and waste stores are trained to maximize performance. They prevent potential non-compliance with environmental legislation and corporate standards and control the items listed in the Site Register of Significant Environmental Effects.

This training is part of the Job Certification Program. ST personnel are given a refresher course every year and at each major change in environmental conditions.

In addition, a more advanced Environmental Awareness seminar was designed and developed at STMicroelectronics University. Now available on a CD-ROM, it is offered to ST's suppliers and customers. This seminar is mandatory for all contractors when the work performed at an ST site may have a significant effect on the environment.

**INVESTMENT IN THE ENVIRONMENT**

We believe that companies investing in environmental protection have a significant advantage over those who wait. Indeed, we believe any investment will largely be repaid if we are capable of designing and implementing pollution-free processes which can reduce the use of natural resources and energy.

At ST, no investment made in energy conservation has taken longer than three years to recover — the average payback time has been less than two years. In 1998 alone, our investments in energy conservation and efficiency allowed the Company to save \$12 million in electricity.

In the same timeframe, ST's savings in water consumption amounted to approximately \$5 million.

We expect a significant savings increase in 1999.



**PAYBACK FROM ENVIRONMENTAL INITIATIVES**

We are all aware of the very serious dangers our planet is confronted with and we bear the collective duty to reduce those risks. Protection of the environment is thus a key mission at STMicroelectronics and the ultimate goal is to achieve environmental neutrality.

Three basic motives are behind this statement. The first, no doubt, is an ethical one that stems from our responsibility as a corporation towards society as a whole.

The second is of an economic nature. Companies that independently and voluntarily make their own activities conform to increasingly stringent environmental protection standards certainly have an advantage over those who do so only when forced by the law. New, environmental-friendly technologies and processes are also leading-edge ones, as well as more efficient and less costly.

Finally, if ST becomes a champion of the environment, it will have a greater appeal for young talent and the best human resources which will help us to grow in line with our goals.

Companies rated as eco-leaders obtain higher scores in vendor rankings, bringing a positive effect on sales. Also, important investment groups (especially banks), are today establishing special green investment portfolios. A careful analysis of performance with regard to the environment will identify companies with a superior growth potential thanks to their efficiency in ecology. More and more, investments are now being made in companies where both financial and environmental performance go hand in hand.

A large investment corporation recently selected six companies in the microelectronics market sector from around the globe for green investment portfolios. STMicroelectronics was the only company selected in Europe, with three from the United States and two from Japan.

#### SUPPLY MANAGEMENT

More and more attention is now given to the purchase of environmentally sound materials and equipment at ST. In the assessment of key suppliers, a number of rating criteria are specifically related to the environment. Vendors have reacted most positively and 87% of key suppliers have obtained, or are in the process of obtaining, ISO 14001 certification; 28% are in the process of obtaining EMAS validation. EMAS validation or ISO 14001 certification will become a necessary condition for all suppliers on the STMicroelectronics Qualified Supplier list.



#### PROBLEMS

In 1998 no additional issues over previous years were identified.

Problems identified from 1993 to 1998 are listed below.

The only open issue listed for 1998 was resolved, as planned, at the end of 1998. In all cases, if there was any doubt, the problem issue was addressed with the local authorities and corrective and/or remedial actions were implemented.

Location Discovery	Nature of problem	Action
<b>Montgomeryville, Pa, USA</b> Acquired problem	Soil contamination from previous business.	Remediation with EPA completed.
<b>Agrate, Italy</b> ST measurement	Ammonia concentration in discharged water - close to limits.	Ammonia in use in production has been decreased (prevention).
<b>Agrate, Italy</b> Measurement by authorities	Aluminum in discharged water at 2ppm versus limit of 1ppm.	Non-repeatable in following measurements. Authorities archived the case.
<b>Crolles, France</b> ST measurement	fluoride concentration in waste water slightly in excess of limits.	Major investment to reduce fluoride discharge completed Q4 1998.
<b>Crolles, France</b> ST measurement	VOC emissions excessive.	Abatement investment completed Q2 1998.
<b>Rousset, France</b> Permit review	Several measures at limit due to growth.	Renegotiate permit limits. Investment to reduce emission.
<b>Shenzhen, China</b> Acquired problem	Hydrocarbon soil contamination.	Authorities informed, and asked to take remedial action. Frequent monitoring of ground water.
<b>Phoenix, Arizona</b> Acquired new property	CFC present in the air conditioning system.	Replacement of the system planned for 1999.



## Corporate Environmental Report

### Result versus Environmental Decalogue Goals

As evidenced in 1998 in our first Corporate Environmental Report, we focus our efforts towards continuous improvement. This report highlights the most critical environmental issues for our industry segment and shows both corporate results and specific achievements from several of our manufacturing sites. Challenging and tough objectives can be met, and even exceeded. Within the Company, these benchmark achievements are a means of cross-pollination of best practices.



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## Corporate Environmental Report

### Energy

Manufacturing fabs need to be chilled constantly, all year round and chillers are the greatest consumers of energy in the semiconductor manufacturing process. Shown here is a free-cooling system which air-conditions clean rooms during the winter months, without the use of chillers. During the winter months, all the heat produced inside the clean room is transferred outside to cooling towers and exchangers and there is no need for the use of chillers. Annual energy savings amount to some 9,000 MWh.



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Meet the most stringent environmental regulations of any country in which we operate, at all of our locations worldwide. Comply with all ecological improvement targets at least one year ahead of official deadlines at all of our locations, worldwide.

### REGULATIONS

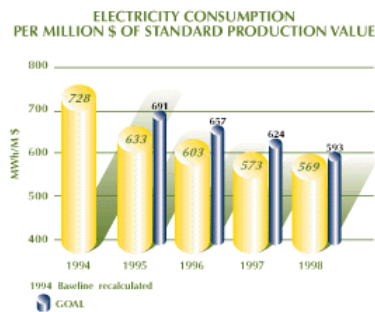
The corporate specifications for waste water and air emissions, the substitution of all ODS Class 1 in manufacturing and facilities, and the choice of EMAS, for instance, are examples of adopting and measuring against the most stringent regulations.

### ENERGY

Energy saving and reduction of greenhouse gases emission are amongst the highest environmental priorities of the Company. We acknowledge the importance of the Kyoto Protocol commitment. By applying the relevant points of our Decalogue in each country that has signed the Protocol and in which we operate, we contribute to its fulfillment.

Where feasible, ST readily enters into other voluntary agreements around the world.

**Reduce total energy consumed per million dollars of standard production value by at least 5% per year..**



The implementation of energy efficiency measures has resulted in a decrease of several thousands of tons of CO2 each year.

In 1998, ST and 13 other microelectronics companies continued the energy projects undertaken by Sematech, the foremost American laboratory in microelectronics research and development.

Last year ST engaged a world class energy consultancy team to investigate more efficient use of energy in ST wafer fabs and thereafter to propose appropriate measures and programs.

The survey has been completed in six of our advanced facilities in France, Italy, Singapore and USA and will be relaunched in 1999.

■ A simple example of energy consumption reduction comes from our Toa Payoh site in Singapore where a project was set up to keep the heat exchange surface of the chiller condenser clean from scale and other deposits. Scale deposit (biological film and sediment) on the condenser tube reduces the heat transfer efficiency of chillers by 34% and increases energy consumption of about 21%. By means of the Ball Technic System

(BTS),™ a fully automated condenser cleaning system regularly circulates slightly oversized sponge balls to pass through the condenser to scour off all scales and fouling. The result: chiller energy consumption was reduced by an average of 20%, or 42,500 KWh per month and per chiller. (170,000KWh per month for the 4 chillers of the site with an energy saving of K\$120 per year).

**Utilize alternative or renewable energy sources to a meaningful degree (at least 3 pilot plants by end 1999).**

Techniques which enable the use of commercially-viable, low-cost alternative energy sources are coming of age in industry in general. Co-generation, as well as other alternate or renewable sources of energy are being thoroughly investigated.

■ Following a feasibility study at Catania in Sicily, a large co-generation facility is planned in the near future. In the semiconductor industry sector, it will be among the first plants of this type in the world. The high efficiency power station will burn methane to generate thermal and electrical power for the site, providing 24MW at full capacity.

The heat co-generated will be used to produce chilled water by the use of absorption chillers. The Catania plant will produce 190GWh of electrical energy per year and an equivalent amount of heat, thus saving some 65,000 tons of CO2 which would otherwise be emitted into the atmosphere. All new sites will be supplied from co-generation plants and, where feasible, existing sites will be retrofitted.

■ ST is also making several feasibility studies on the use of renewable energy. Some projects are in the advanced phase such as the installation of a 1.5MW photovoltaic plant in Morocco, 200KW fuel cells in Italy, an 180KW thermal solar plant in Singapore and 500KW wind farm to supply our Headquarters in Saint Genis (France).



## Corporate Environmental Report

### Water

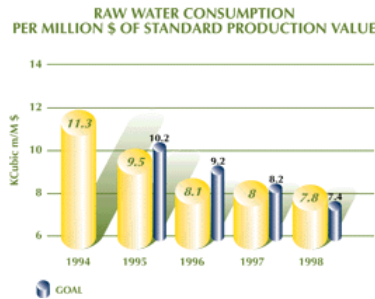
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Water plays a critical role in the manufacture of semiconductor products and because of the extreme sensitivity of processes, only ultra-pure water can be used. This is created by reverse osmosis and de-ionization. In addition, the water is specially treated and this consumes both energy and chemicals.

Water conservation is a general ST corporate goal, but it is an imperative at several STMicroelectronics manufacturing sites where water supplies are scarce or diminishing - Malta, Rancho Bernardo, Phoenix, Catania and Singapore, for example. At a corporate level, STMicroelectronics has substantially cut its use of water, reducing the cubic meters used per million dollars of standard production value from 11,300 in 1994 to 7,800 cubic meters in 1998. Last year we met 95% of the Decalogue goal, mainly due to the production level decrease during 1998. Especially for those sites with shortage of fresh water, reduction in water consumption has been made through recycling activities.



**For all manufacturing operations, reach a level of 50% recycled water by end 1997 and 90% by end 1999.**

A simple example of water consumption reduction comes from our manufacturing site in Rancho Bernardo in San Diego, California.

In 1998 the site initiated and completed a K\$70 capital project to reuse waste water. The system was based primarily on an advanced waste water treatment system with filters and chlorination.

Instead of discharging waste water from the neutralization system, the water is reused for a variety of industrial processes including air emission scrubbers, bottle washing, and cooling water for the thermal processing units (TPU). This reuse of waste water accounts for over 10% of the site's total water use.

In Malta, large volumes of water are used during silicon wafer cutting. In the slicing process, silicon dust is too fine to be captured by traditional filters. The site installed a microfiltration unit to remove the fine particles and the water was then further purified by passage through ion-exchange resin columns. It was then clean enough to be recycled for operations requiring extremely high purity water. As a result, city water used was reduced by some 13,000 cubic meters per year.

A system was also developed for recycling the waste brine, discharged by the plant's Electrodialysis Reverse

water purification. The concentrate waste was collected and, after filtration and chlorination, the water became suitable for non-potable use in toilet flushing. A separate storage and distribution system now directs this water to more than 90 toilet units in the facility. City water consumption dropped by a further 6,500 cubic meters.

During the second quarter of 1998, the Malta site made a major effort to recycle waste water from its electroplating operations. During this process, residual metals always pollute the water. It makes sense to recover the valuable metal and clean the water for reuse whenever technically and economically feasible. The new design uses ion-exchange resins to recover the metals and reverse osmosis to further purify the water. 80% of the waste water effluent is now recovered with a saving of 60,000 cubic meters annually, equivalent to 50% of the present water intake.

The final component in the site's comprehensive water conservation strategy was the installation of a rainwater capture and recycling system. By the second quarter, the facility had reduced its consumption from city mains from 183,000 cubic meters per year down to 52,000 cubic meters &mdash; a remarkable reduction of 72%.



## Corporate Environmental Report

### Paper

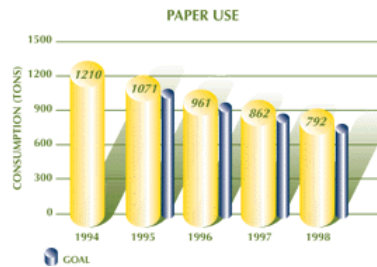
**Trees : reduce total paper and paper products consumption by 10% per year. Reach a usage level of 90% recycled paper where paper is a necessity by end 1995 and maintain that level.**

Since late 1997, more than 90% of the paper used by STMicroelectronics is recycled paper. We have reached our Decalogue goal, albeit two years late. Our next step, where possible, will be to use paper from environmentally certified forests.

STMicroelectronics has thousands of different products in its portfolio, each with complex specifications. These need to be documented in detailed technical manuals, data-sheets and user notes. Consequently, significant amounts of paper go into publications. Printouts, photocopies, office forms, clean room paper (lint free) and a very large amount of cardboard for product packing and shipping also account for large volumes of paper.

Throughout the world, however, ST has cut the use of paper by more than 35% in the 1994-1998 timeframe.

By publishing technical documents on CD-ROMs the number of publications printed decreased from 240 to 60 tons in just two years. ST's 40 volumes of product catalogues were scrapped and the information put on to one CD-ROM. We are confident that a further decrease is possible. During 1998 the Company distributed 111,000 CD-ROMs and the forecast is for 200,000 CDs in 1999.



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## Corporate Environmental Report

### Chemicals

Chemicals are used in large quantities to etch and clean the surface of wafers. In the semiconductor industry, they are, however, the main source of pollution to the environment. Sulphuric acid recycling has met with significant success at ST. The H2S04 processor shown here has enabled ST's front-end wafer fab at Ang Mo Kio in Singapore to reduce its annual requirements for sulphuric acid by 95%.



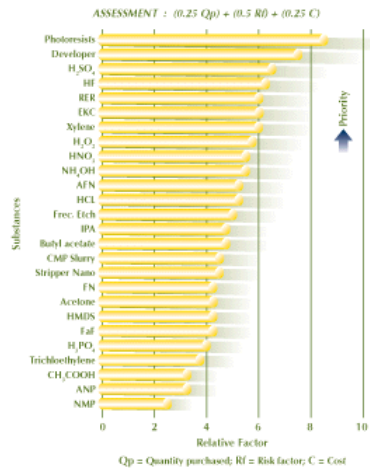
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Recycle the most used chemicals - e.g. for sulfuric acid recycle > 30% by end 1997 and 80% by end 1999.

The semiconductor manufacturing processes require significant amounts of chemicals. ST is working in all directions to save these hazardous substances by substitution, process optimization, hardware modifications, on-site generation, recycling for reuse, and the installation of Total Chemical Management (TCM) in partnership with key suppliers, to name a few. This will improve the management of chemicals in terms of safety, tracking system and cost.

Engineers working on wet processes (cleaning processes using chemicals) are at the forefront of our efforts in chemical saving programs. In addition to the undeniable benefits to the environment, health and safety the initiatives bring significant savings in cost, as well as better process performance.

### ST PRIORITIES FOR CHEMICALS SAVING PROGRAMS



In 1998, a global chemical survey was conducted to identify priorities in chemical savings. Three criteria were used: environment health and safety parameters, cost and global consumption. Photoresists, developers, sulfuric acid, nitric compounds, fluoride compounds, ammonia and hydrogen peroxide were identified as priorities. Several additional chemicals used in specific applications are also targeted : xylene, phosphoric acid, isopropyl alcohol (IPA) and acetone.

Central R&D in our Agrate site in Italy is already preparing the long term with a strategic and revolutionary process known as "Twin Clean". Once in effect, this process will bring about significant reductions in the use of ammonia, hydrogen peroxide and sulfuric acid. The process will also bring a 50% increase in throughput, de-ionized water will be reduced by a factor of three, with an appreciable diminution in footprint of machinery.

■ At Crolles, in France, many different optimizations have been successful. Half pitch carriers have been installed and chemical consumption has been reduced by half. With the optimization of tools, the lifetime of chemicals has increased by 15%. The isopropyl alcohol (IPA) reduction program brought a 40% reduction in consumption, with the IPA emission being divided by ten. Annual savings are \$K100. The implementation of a new post ash-clean and photoresist stripping strategy reduces costs by one third, with the total chemical consumption reduced by half.

■ At several ST sites in France, the United States and in Italy, depending on the chosen process, savings ranging from \$K400 to \$K1200 are being made thanks to a process which optimizes the low flow pick up in equipment. At Ang Mo Kio in Singapore, resist dispense systems were upgraded with an original new design, with savings of \$1.2 million per year.

■ Also at Ang Mo Kio, a sulphuric acid recycling system &mdash; including collection, reprocessing and distribution &mdash; has enabled the site to reduce its annual requirements for sulphuric acid by 95%. The consumption of H<sub>2</sub>SO<sub>4</sub> was 500 liters per day. An additional 571 liters per day of NaOH were used to neutralize it in the waste water treatment plant. The implementation of a recycling project cut the consumption of H<sub>2</sub>SO<sub>4</sub> and NaOH, resulting in a total project payback in less than 1.5 years.



## Corporate Environmental Report

### Pollution

Acid droplets, dust and fumes from manufacturing processes are harmful to man and to the environment if not properly controlled. At ST sites, as shown here, scrubbers treat the acid droplets, and fumes by means of industrial filtration before discharging to the atmosphere.



**Air emissions: phase out all CLASS 1 ODS by the end of 1996.**  
**Contribute where we can to the reduction of greenhouse and acid rain generating gases.**

By the end of July 1993, all Class 1 Ozone Depleting Substances were eliminated from production processes and by end 1997 all large refrigeration units (chillers) were replaced with more efficient, economical and environmental-friendly equipment. Also, since February of 1998, no site retains fire-fighting systems which rely on environmentally harmful halons.

These actions required an investment of some \$20 million. The final step, now in progress, is to phase out all the remaining Class 1 ODS still present in some small equipment as well as in the air conditioning system in a newly acquired building in Phoenix, Arizona.

Manufacturing sites emit pollutants such as acids, alkalis, solvents to the air. At most ST manufacturing facilities, site scrubbers have been installed to abate these emissions. All scrubbers are equipped with variable frequency drives to conserve energy and to maintain a standard exhaust pressure for the fab equipment.

In addition to several optimization of processes such as the reduction of isopropyl alcohol usage and upgrade of IPA dryers, the Company has installed equipment to cut the emission of Volatile Organic Compounds (VOC) and toxic vapors at several sites. At Carrollton in Texas, this equipment has reduced solvent emissions by 80-90% and 90 tons of vapors are now destroyed each year.

Significant further investments in this area are planned across the corporation. Also in Carrollton, the highly advanced Fourier Transform Infrared Spectroscopy (FTIR) for real time, continuous emission testing from stacks has been installed. Its instrumentation provides chemical detection at concentrations as low as 5 parts per billion. All of these projects are intended to verify the proper operation of all air abatement equipment. The project cost for a typical site is in the region of \$K80.

The semiconductor industry currently emits fluorocarbons (CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, CHF<sub>3</sub>, C<sub>3</sub>F<sub>8</sub>), nitrogen trifluoride (NF<sub>3</sub>), and sulfur hexafluoride (SF<sub>6</sub>) from its manufacturing process. These gases (collectively referred to as perfluorinated compounds (PFC) are used in two important steps of semiconductor manufacture: plasma etching of thin films and cleaning Chemical Vapor Deposition.

Due to their high global warming potential and long atmospheric lifetimes, PFC are now included in the Kyoto Protocol framework and emission reduction goals have been established by country.

ST Microelectronics is highly committed to the reduction of PFC emissions. Under an international voluntary agreement, promoted by the US Environmental Protection Agency (EPA), ST has agreed to reduce the use of PFC. The European Electronic Components Manufacturers Association (EECA) task force, led by ST, is working to establish a similar program in Europe. In 1997 ST signed a Memorandum of Agreement committing to the reduction of PFC emissions and to share PFC data and technical information with other semiconductor companies operating in Europe.

ST is also involved in other working groups such as the PFC leadership group in the United States and in SEMATECH international programs. The Company participates in the World Semiconductor Council EHS task force where PFC issues are addressed by the industry as a whole. The World Semiconductor Council's challenging common goal of reducing PFC emissions by 10% in absolute quantity with 1995 as a base year is fully supported by ST.

The Company is working closely with equipment and gas suppliers to establish a consistent PFC reduction roadmap. In the technologies investigated, priority is given to proactive solutions : process optimization through less usage of gases; better gas utilization during the process; reduction of process time; retrofits of equipment.

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Focus is also on the search for alternative chemistries, rather than the systematic utilization of emissions abatement techniques.

Some highlights in ST sites are :

- At the R1 facility in Agrate, Italy, a 50% PFC emission reduction has been demonstrated through a very promising dielectric etching process optimization program.

- A partnership between the R1 facility at Agrate, LAM Research and Bari University was signed in 1997 for the testing of new PFC substitutes in the etching processes.

- PFC abatement systems with good Destruction Removal Efficiency (DRE >95%) are installed in several plants - Rancho Bernardo, Crolles, Agrate, for example.

- Optimized C3F8 recipes have been implemented in Catania in Italy and Carrollton in the United States, bringing a reduction of 40% in the emissions versus previous recipes using C2F6.

- At Crolles, in France, NF3 with dedicated fluor abatement devices are used for replacing C2F6 gas. (NF3 has a better utilization rate in the process chamber).

**Water emission: meet the standards of the most restrictive community in which we operate, at all sites, for waste water discharge.**

All sites have invested in waste water treatment plants and with significant increases in production, these have been upgraded in order to maintain the water parameters within the stringent corporate limits. Subject to the tight Italian waste water discharge limit of 6 milligrams of fluorides per liter, the Agrate site in Italy upgraded the existing waste water plant at a cost of about \$1 million and installed a second plant to further reduce the fluorides. Fluoride concentrations in water are now about three milligrams per liter, substantially below the legal limit of six milligrams.

The limit of six milligrams of fluoride per liter has been adopted by ST as the corporate standard the world over.

- At Rousset, in France, a new Waste Water Treatment Plant (WWTP) shared by other manufacturing sites in the industrial park, guarantees the following :

**Noise: meet a "noise to neighbors" at any point on our property perimeter less than 60 dB(A) for all sites, from end 1995.**

The Decalogue limits the noise emissions from all sites to 60 dB(A) at the perimeter. Noise may be generated by nitrogen plants, cooling towers, air compressors, scrubbers or other operations. At each site, noise is measured periodically at strategic points around its perimeter.

- The ST site in Rennes, France, for example's is surrounded by housing estates. Silencers were introduced at critical points on the epitaxy scrubbers and since October 1997 noise levels are kept at a 48dB(A) level. Other sites not meeting the 60 dB(A) noise level limit have taken a similar approach.

- At Rancho Bernardo in California, sound attenuation walls were installed at two strategic locations - the new nitrogen plant and scrubber. The noise level at the site is now close to 54 dB(A) on average at the site perimeters.



## Corporate Environmental Report

### Contamination

**Handle, store and dispose of all potential contaminants and hazardous substances at all sites, in a manner to meet or exceed the strictest environmental safety standards of any community in which we operate.**

Semiconductor manufacturing requires the use of potentially contaminating chemicals and gases. Spills or leaks of acids, solvents, fuel or other chemicals are a potential hazard to the soil and groundwater. For this reason, liquid chemicals are surrounded by containment structures to prevent contamination during accidents or emergencies. In manufacturing areas, chemicals and toxic substances are stored in separate and clearly marked containers. In the chemical stations the connecting loading points of the different chemicals are mechanically differentiated so as to avoid any possible human error by loading the wrong chemical into the wrong container.

All sites have an emergency response team to deal with spills or leaks that may occur. At several sites, just-in-time chemical delivery is used to minimize chemical inventory. Ground wells at the up-gradient and down-gradient of every site have also been installed to track the quality of the groundwater flowing under the location. Analyses are made at least once a year and more often if there is a potential concern.

■ At Muar, in Malaysia, three important initiatives have been implemented:

- a secondary containment for the storage of HCl and NaOH;
- transferral of spillages or leaks during loading or unloading of HCl and NaOH to the waste water treatment plant;
- construction of trenches for carrying liquid other than clean water.

In addition to the precautions listed above, each site strictly monitors the disposal of waste using consignment notes to track waste from the site to its final destination. Known as the Manifest System, its purpose is to ensure that every load of waste leaving the site arrives at an appropriate facility for recycling, treatment or disposal. By ensuring that wastes are being taken to proper facilities, the site can minimize, if not eliminate, any future health, safety and environmental liabilities to ST.

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## Corporate Environmental Report

### Waste

Very often, waste from our manufacturing processes is a raw material for other industries and we show here an "Ecological Island" where different categories of waste are collected in separate containers, each destined for different types of reuse or recycling.



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**Achieve 100% treatment of waste at level 1 to level 4 of ladder concept preferability, with a half life improvement goal of less than one year.**

### LANDFILL

Landfill is considered to be an extreme solution, especially in the light of legislation that will limit landfill only to "ultimate waste" that cannot be recycled. More and more, at ST's sites around the world there are separate collections in homogeneous categories of waste. To date, some 30 categories have been identified. At present, this is the main means for minimizing disposal to landfill and to improve its reuse and recycling. There are several aspects to this point: waste may pose a threat to the environment, it is subject to legislation, and can also be turned into a source of revenue. It is therefore important to adopt the best practices in waste management, to maintain an accurate and regular reporting system and to benchmark ourselves within the Company, vis-a-vis other semiconductor manufacturers, and with the best in class waste management companies.

The Ladder concept is explained in Appendix 3.



At Agrate, in Italy, an "ecological island" was constructed where some 20 different types of waste are safely collected in separate skips.

Subsequent recycling minimizes the need to use local landfill sites. These initiatives are being repeated at other sites.

### MANUFACTURING

**Recycle 80% of manufacturing by-product waste (metal, plastic, quartz, glassware etc.) with a half-life improvement target of less than 1 year.**

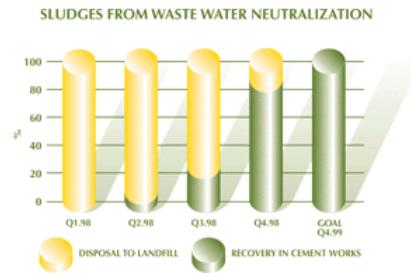
Experience has shown that recycling waste is less expensive than discarding it. The graph below shows the achievement obtained in manufacturing waste reuse/recycling at Corporate level.



#### Sludges

The sludges produced by the physical-chemical treatment of the waste water, a by-product of our activities, are, in effect, raw materials for other industries: the cement and brick industry, for example. Sending sludges, typically containing calcium fluoride and calcium sulphate to such industries is the best approach to waste management. It revalorizes, recycles and minimizes landfill.

At our Catania site alone, some 800 tons per year are recovered in this way, bringing savings of \$K70 per year. Similar initiatives exist at our sites at Tours and Rousset in France, and at Agrate and Cornaredo in Italy. The graph below shows the success of efforts made in Agrate during 1998 to reduce the disposal to landfill.



#### Deflashing waste

Two deflashing media exist in our product assembly sites: glass or brass powder. Brass powder is used in Ain Sebaa (Morocco) and in Muar (Malaysia). In both cases the powders are sent out and any precious metals are recuperated. ST is then paid for these.

The ST Singapore and Malta sites use glass media and although the material itself is recyclable, for the moment there is little interest from recycling companies. Waste volumes generated are around 4.5 tons in Malta and 26 tons in Singapore. A solution is being sought at both sites.

#### Protective clothing (gloves)

At Tours in France, a glove recycling program started in 1997. This required switching from vinyl to nitrilite gloves. With better mechanical resistance, only 9 pairs of nitrilite gloves were used per day and per person, as opposed to 13 pairs of vinyl gloves per day and per person. Annual savings are of \$K25 per year. In addition, by recycling 30% of glove consumption, savings of \$K16 were made in 1998 and this recycling rate will shortly increase when washable ink pens are introduced. Up to the present time, the stain of ball point pens was the main obstacle to full recycling.

#### PACKING

**Move to 80% (by weight) recyclable, reused, or biodegradable packing materials (cartons, tubes, reels, bags, trays, padding) with a half life improvement goal of less than one year.**

STMicroelectronics is confronted with two problems in this area. We have to dispose of the packing that comes from external suppliers and also ensure that our own packing is recyclable or reusable. To do this, we continue to pack our products in homogeneous materials, not in composite material, thus avoiding the use of expanded foam with ODS and heavy metals. No chlorine-whitened materials are used and where possible, biodegradable materials are selected.

In some regions, ST and other semiconductor manufacturers in the area have contacted recycling companies where the customers can send used packing tubes as long as this packing material is not mixed and is clean. As long as these companies can resell the byproduct of their recycling, no cost will arise - either for ST or for the customer. In wafer packing, our approach relies on reuse and recycling. Single wafer containers are designed to be reusable after cleaning. At present, the total of reused and recycled packing waste has reached 87% - exceeding the Decalogue goal by about 10%.



ST is also experimenting with a new approach in reusing the raw packing coming from its silicon suppliers for inter-company wafer shipment.

#### **AGRATE "ECOLOGIA ISLAND"**

Single containers for:

- Metals
- Copper
- Glass
- Oils
- Scraps (wafers and finished products)
- Urban waste
- Plastic
- Paper
- Cardboard boxes
- Wood
- Unclean glass
- Unclean plastic
- Ni/Cd batteries
- Lead batteries
- Resins
- Mercury lamps
- Fluorescent lamps
- Sludges

There is therefore no waste of packing received from the customer and there is no need to use new packing material to ship the wafers. Shipping costs have been reduced, volume is down by 55% and total shipping weight has been decreased by 65% when compared to traditional shipments.

#### **Information to customers**

The ever-pervasive use of electronic products has sharply increased the quantities of waste from electrical and electronic equipment (WEEE), and ST receives many questions from customers as to the chemical content of its products. The Company is fully committed to reducing the effects of its industrial activities on the environment and is proactive in helping its customers to obtain the best Design for Environment (DFE) for their electronic equipment. Detailed information on all ST products is given to customers and a technical report entitled Chemical Content of Semiconductor Packaging describing the chemical and physical characteristics of ST packages has been published. The report contains detailed tables, covering groups of packages with a similar structural process and material composition. It covers more than 250 packages with plastic, ceramic, glass and metallic cases and is available on the ST website.



## Corporate Environmental Report

### Product and technologies

Since 1990 ST's power-saving chips are used to replace the magnetic ballast in fluorescent lamp controllers. In the last five years, the use of 700 Million ST devices in these lamps, resulted in a cumulative energy saving of about 5 TWh equivalent to the yearly consumption of 3 big towns of 1 Million inhabitants each.



**Accelerate our efforts to design products for decreased energy consumption, and to enable more efficient applications, to reduce energy consumed during operations by a factor of more than ten by year 2,000.**

As a broad range semiconductor manufacturer, ST recognizes its responsibility towards Design For Environment. The constant aim is to manufacture products that are inherently less power-hungry and/or which enhance energy efficiency during their application.

Our products already contribute directly to a cleaner environment. In the automotive sector, for instance, microelectronics applications inside the engine management system reduce pollution by influencing ignition, fuel injection and consumption and exhaust emissions. Peak and hold injector drivers, stepper motor drivers and Lambda sensor interfaces are other examples.

Microelectronics also decrease the energy consumption in domestic appliances. In air conditioning units, for instance, ST's Fuzzy logic chips reduce the energy used by almost 30%.

Smart chips used in lighting decrease energy consumption and extend the life of fluorescent tubes, while microcontrollers improve a customer's ability to control the power consumption of domestic appliances.

In television stand-by mode applications, ST's power-saving chips enable savings of approximately 7 watts per unit. If this is applied to the television sets sold throughout the world in one year, savings can amount to the equivalent of the annual output of a large power station.

An ad hoc Corporate Environmental Working Group has developed a model to determine the average energy consumed by our products in operation. For logic and memory chips, we are on target to achieve our goal of a factor ten reduction relative to 1994 by the year 2,000. For power chips, where the applications are usually well optimized and their performances are more in the hands of system rather than silicon designers, we are close to our goal.

### LIFE CYCLE ASSESSMENT (LCA)

The LCA is a process which evaluates the environmental burdens associated with a product. This is done by identifying the energy and materials used and the wastes released to the environment so that improvement can be made.

The assessment covers the entire life cycle of the product.

At ST, major efforts were dedicated to an important step of this process, termed Life Cycle Inventory (LCI). This is an objective databased process of quantifying all relevant mass and energy input and output flows in the manufacturing of our products - including air emissions, water effluents, solid wastes and other releases to the environment.

In 1998 this exercise was performed both for our front-end wafer fabs and back-end test and assembly operations. The final report was supplied to one of our key customers who is performing a complete LCA study for one of its products.

We will continue to perform Life Cycle Inventories to enable us to make a Life Cycle Assessment of our products (two representative studies have already been performed). We will continue to provide this information to our customers so that they may make the same environmental assessment for the final product.

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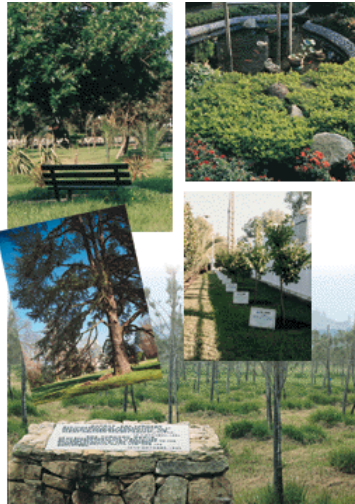
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## Corporate Environmental Report

### Proactivity

STMicroelectronics has committed to plant ten trees for every employee and this commitment has been enthusiastically adopted by ST employees around the world. Shown here is some of the "green goodness" at a selection of the sites.



**Proactively support local initiatives such as "Clean-up the World", "Adopt a Highway" etc. at each site in which we operate, and encourage our employees to participate. Undertake the lead in establishing such initiatives with local authorities, where none exist. Sponsor an annual "Environmental Day" at each site where we operate, involving the local community.**

The activities of a company such as STMicroelectronics can be a reference point in raising the environmental awareness of the community at large, and more especially the communities in which we operate. We aim to foster progress which is sustainable and which does not require an unacceptable cost to society. We have already established a dialogue with suppliers, customers and with a larger audience.

For example, the Company's commitment to plant ten trees for every employee has been enthusiastically adopted by ST employees around the world.

■ Major tree-planting initiatives were taken at a national park in Malta, in Casablanca in Morocco, on the banks of the river Molgora near Agrate in Italy and on the Massif Saint Victoire near Rousset in France. In 1999 a tree planting program will be initiated at our Carrollton site in Texas. ST's vendors and contractors will sponsor a tree by buying it and ST will pay for planting the trees, with a dedication plate on each one.

■ In association with other companies and organizations, ST at Agrate, established a local Center for Environmental Excellence. The objective is to increase the understanding of environmental issues in schools, business and local authorities.

■ At Carrollton, for the fourth consecutive year, ST was a major sponsor at the "Trinity River Awareness Day", organized to underline the importance of the river to the surrounding area. Citizens gathered at 12 locations along the Trinity to clear more than 200 miles of its banks of trash and debris, and to enjoy various river-related activities, with a free lunch for their efforts. ST gives financial support to this event and a significant turnout of ST volunteers participate in the cleanup.

■ Last year, several ST employees at Carrollton contributed their time to cleaning a two-mile drainage culvert &mdash; collecting over one ton of trash material.

■ At Rancho Bernardo, California, ST co-sponsors an annual Environmental Fair each April to celebrate "Earth Day". This event is attended by the employees of the industrial park in which the site is located and all employees have an enjoyable opportunity to learn about environmental protection and ecology.

**Encourage our people to lead/participate in environmental committee, symposia, "watch-dog" groups etc..**

■ In Phoenix, Arizona, ST is member of two local environment organizations. Each year ST sponsors an event called "Earthfest" with Valley Forward. Local companies create interactive environmental exhibits related to transportation, air quality, recycling, land use and agriculture. Some 5,000 students and members of the general public attend each year.

■ The Arizona Environmental Strategic Alliance is focused in two major areas: sustainability and green building. In 1998 the Sustainable Arizona Forum included presentations on promoting community-based sustainability, green building, and land and water preservation. Attendees came from Arizona organizations working on Sustainability. The keynote address was delivered by the Executive Director of the President's Council on Sustainable Development.

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STMicroelectronics works with national and international associations as well as with local groups. Since 1994 ST has coordinated the European participation in the International Conference on Environment, Safety and Health (IESH) sponsored by the Semiconductor Industry Association (SIA), the European Electronic Components Manufacturers Association (EECA), the Electronic Industry Association of Japan (EIAJ), and the Korean Semiconductor Industry Association (KSIA).

On a global level, ST is also a member of the World Business Council for Sustainable Development (WBCSD), of the Sustainable Business Forum and of the World Semiconductor Council (WSC) ESH Task Force. In this context, Pasquale Pistorio, ST's President and Chief Executive Officer chaired the April 1999 assembly of the World Semiconductor Council in Italy and also actively represents the European Electronic Component Manufacturers Associations (EECA) within the Council.

ST's involvement in national and international trade associations appears in Appendix 4.

**Include an environmental awareness training course in the st University curriculum and offer it to suppliers and customers.**

Since 1995, STU offers courses and seminars on Environmental Awareness on a regular basis. "Train the Trainer" modules are designed to ensure that environmental awareness is cascaded throughout the Company. A dedicated session on Environment is also included in training addressed to the new hires. The Environmental Awareness Seminar was published as a CD-ROM in 1998 and has greatly amplified awareness both internally and with suppliers.

Just after the April 1999 World Semiconductor Council meeting, in a letter to Pasquale Pistorio, President Clinton of the United States recognized and praised the ambitious goals taken by the world microelectronics industry.

THE WHITE HOUSE  
WASHINGTON

May 20, 1999

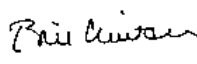
Mr. Pasquale Pistorio  
Delegation Chairman  
European Electronic Component  
Manufacturers Association  
Avenue Louise 100, Nivelles 14  
B-1300 WILLEM  
BELGIUM

Dear Mr. Pistorio:

I want to commend the World Semiconductor Council and everyone involved from the European Electronic Component Manufacturers Association for their role in setting a world wide strategy to reduce emissions of perfluorocarbon (PFC), gases that contribute to global warming.

The World Semiconductor Council's goal to reduce global PFC emissions by 10 percent below 1995 levels by 2000 represents an ambitious commitment. The Council's pledge to share information on techniques, innovations will make this goal possible by allowing the industry to reduce PFC emissions cost-effectively. Through this action, the semiconductor industry is setting an excellent example by taking a pro-active, cooperative approach to meeting the challenge of climate change.

I thank you for your hard work and leadership in addressing this important issue. More importantly, our organizations will thank you for reducing emissions of these long-lived chemicals and for contributing to a sustainable, more stable environment.

Sincerely,  






## Corporate Environmental Report

### Measurement

**Develop measurements for, and means of measuring progress/achievement during 1995, using 1994 as the baseline where applicable, and publish results annually in the CER. Continue the existing Environmental Audit and Improvement program at all sites.**

Measurements drive behavior and accurate auditing sets the framework within which ST can specify, quantify and monitor progress. Without measurement, we cannot achieve excellence.

Progress made as a result of these corporate directives is controlled at site level. Each site enters its results into the Environmental Database, or "dashboard" which allows a comparison of environmental indicators, site by site. Internal benchmarking and cross-fertilization are carried out through the exchange of best practices. Corporate Environmental Audits are conducted every 18 months at every site to ensure the correct application of corporate environmental practices and to monitor action plans/status vis-a-vis the Company's environmental goals.

The major environmental projects are monitored and reported to the Corporate Environmental Steering Committee which meets every quarter, chaired by our CEO.

Continuous monitoring of objectives and the setting of environmental targets and initiatives will ensure that progress continues - now, and in the years to come.

The more ambitious and challenging goals of the new Decalogue will be published in the second half of 1999 and will become our reference for the 2000-2010 environmental objectives.

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## Corporate Environmental Report

### Validation

**Validate to EMAS standard, or equivalent, 50% of sites by the end of 1996, and 100% by the end of 1997.**

### EMAS

The Eco-Management and Audit Scheme (EMAS) is the voluntary European Community scheme for companies performing industrial activities for the evaluation and improvement of environmental performance. Site validation by an accredited third party within the EMAS scheme is achieved through:

- the establishment and implementation of an appropriate company policy, program and environmental management system;
- the systematic, objective and periodic evaluation of environmental performance and publication of the results to the public.

### ISO 14001

This International Standard specifies requirements for EMS to enable an organization to formulate its policy and objectives on the environment. This Standard is applicable to any organization that wishes to:

- implement, maintain and improve an environmental management system;
- assure itself of conformance with its stated environmental policy;
- seek certification of its EMS by an external organization;
- make a self-determination and self-declaration of conformance to this International Standard.

By the end of 1997, all 17 of ST's manufacturing sites were EMAS validated and ISO 14001 certified. As a pre-requisite to obtaining EMAS validation, every site prepared and published a detailed Environmental Statement outlining its consumption of natural resources and release of substances to the environment. As required by EMAS, all sites update this Statement annually.

To maintain ISO 14001 certification, all sites receive a yearly surveillance visit by third parties. By the second quarter 1999, six manufacturing sites have been successfully EMAS re-validated and ISO 14001 recertified after the three year cycle. Revalidation/recertification of four other sites is planned for 1999, with the seven remaining scheduled for the year 2,000.

[Highlights regarding EMAS and ISO are listed in Appendix 5.](#)

[Awards and Accolades received by STMicroelectronics are listed in Appendix 6.](#)

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## Corporate Environmental Report

### Awards and Accolades Appendix 6

Since 1991 the Company's sites have received more than 60 awards, of which 24 were for environmental issues:

<b>1991</b>	Champion: Clean and Beautiful Factory Competition	<i>Muar, Malaysia</i>
<b>1993</b>	Winner: First Landscape Competition Cornucopia Award: Environmental and Health Coalition	<i>Muar, Malaysia Rancho Bernardo, California, USA</i>
<b>1994</b>	Recognition: Malta Ecological Society Trophy: Best Effort, Clean Up the World Campaign Award: Ministry of the Environment  Charter Member: Clean Texas 2,000  Certificate of Merit: Recycling and Waste Reduction in the Workplace	<i>Kirkop, Malta Kirkop, Malta Toa Payoh, Singapore Carrollton, Texas, USA Carrollton, Texas, USA</i>
<b>1995</b>	Trophée Hélianthe: Prévention, Récupération, Valorisation des Déchets Winner: Environmental Achievement and Restoration That Help (EARTH)  Certificate of Merit: Recycling and Waste Reduction in the Workplace  Certificate of Environmental Responsibility  Certificate of Plastic Reuse  Certificate of Appreciation: Texas Lake and River Cleanup Program	<i>Saint Genis, France Carrollton, Texas, USA Carrollton, Texas, USA Carrollton, Texas, USA Carrollton, Texas, USA</i>
<b>1996</b>	Recognition: City of San Diego Environmental Services Department's Waste Reduction and Recycling Award Recognition: Valley Forward Association  Certificate of Appreciation: Texas Lake and River Cleanup Program  Prize: Puliamo il mondo - LEGAMBIENTE	<i>Rancho Bernardo, California, USA Phoenix, Arizona, USA Carrollton, Texas, USA</i>
<b>1997</b>	Recognition: French Ministry of the Environment-EMAS Certificate of Registration  Award: EPA Ozone Protection	<i>Agrate, Italy All ST sites in France Kirkop, Malta</i>
<b>1998</b>	Prize: French Ministry of the Environment and French Chamber of Commerce prize for Gestion Environnementale  Award and special commendation from the Jury: European Better Environmental Award for Industry in the category of Managing for Sustainable Development  Winner: Waste Reduction Award Program (WRAP) California Environmental Protection Agency Integrated Waste Management Board Trophy: Trophée Enterprise Environnemental Catégorie Grandes Entreprises by Enjeux-Les Echos and Price Waterhouse Coopers	<i>All ST sites in France All ST sites in France All ST sites in France Rancho Bernardo, California, USA All ST sites in France</i>

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