Environmental Report 2011

www.ams.com

	2004	2005	2006	2007	2008	2009	2010	2011
Production waste water	265704	277040	295604	408229	319265	284389	322088	357471
Sanitary waste water	5288	3995	4246	5948	5235	4180	4421	

COMPANY PROFILE

ams was established in 1981 as a joint venture between VOEST Alpine AG and American Micro Systems Inc. (AMI), under the name Austria Mikro Systeme. In 1987, VOEST Alpine acquired AMI's interest, and in 1993 the company became the first semiconductor concern in Europe to be quoted on the stock exchange. A strategic “public to private” step by a financial investor took place in 2000, to allow the construction of a 200mm wafer factory using state-of-the-art technology, and to enable the implementation of medium-term innovation projects. Following a strategic repositioning, ams successfully completed an Initial Public Offering (IPO) in May 2004, and has been quoted on the SWX Swiss Exchange in Zurich since 17 May 2004. In July 2009 ams joined the world largest sustainability initiative, the United Nations Global Compact. The UN Global Compact deals with human rights, labour conditions, environmental protection and anti-corruption.
In 2011 ams merged with a US semiconductor company called TAOS. This company is leading company in opto-sensor solutions to the electronic market.
In 2012 we integrated our existing environmental policy in a corporate wide Corporate Social Responsibility Policy

ams is ranked amongst the world's leading development and production companies for integrated analog/digital circuits (microchips/ICs) that are specifically tailored to individual customer requirements. Within the four strategic business fields of:

- Communications
- Industry & Medical
- Automotive
- Full Service Foundry
- Opto Sensor and Lighting

The range covers the entire value-added chain of the semiconductor industry. As well as research and development, design and process development, this also includes mask lithography, wafer production, assembly and test.

Strengthened by investment in a production facility (Fab) using cutting-edge technology, ams offers a spectrum of advanced process technologies for analog/mixed-signal applications.

This strong position was secured on a long-term basis by the strategic cooperation with TSMC (Taiwan Semiconductor Manufacturing Company Ltd.), the world's largest contract manufacturer for wafers, arranged in 2001.

The products of ams, known as microchips, are to be found in almost all walks of life – in mobile phones, MP3 players and other portable devices, in glucose meters, insulin pens, in airbags and engine immobilisers, as well as radio-controlled locking systems (keyless entry/keyless go). They are a central component of rain sensors, cardiac pacemakers and electronic meters for electricity, water and heat.

Worldwide, ams is represented in many countries like in Austria, Italy, Spain, Philippines, France, Finland, Sweden, U.K., Germany, Switzerland, USA, India, Taiwan, Singapore, China and Korea.

Since its establishment in 1981, ams has attached the greatest importance to compliance with the highest quality directives. Certification to ISO 9001 and ISO TS 16949 has provided repeated proof of this over the last 15 years.

Corporate Social Responsibility Policy

(including Environmental, Safety & Health)

ams is committed to an overall Corporate Social Responsibility involving responsible and visionary environmental management and comprehensive health and safety protection.
All our activities are aligned with our internal guidelines and will be continuously improved.

Corporate Sustainable Responsibility

As a member of United Nations Global Compact Initiative, CSR activities are fully integrated into our daily business and are aligned with the ten principles in the areas of human rights, labor, environment and anti-corruption.

Employees

We provide a safe and healthy workplace to all employees at ams. We have a strong focus on reducing accidents and promoting health. We motivate our employees through information and training on environmentally-aware activities.

Legal Compliance

We operate in compliance with all legal and voluntary requirements, in all environmental related matters. ams respects and complies with the fundamental employment rights set out in international conventions of the Unitet Nations.

Business Activities

We fully assess the environmental impact of our business activities and operate in a manner that avoids or minimizes emissions of pollutants and reduces energy consumption.

Customers

We work with customers to solve their problems regarding environmental protection and corporate responsibility issues.

Suppliers and Subcontractors

We work together with our suppliers and subcontractors to improve environmental, health and safety activities.

Publicity and Communication

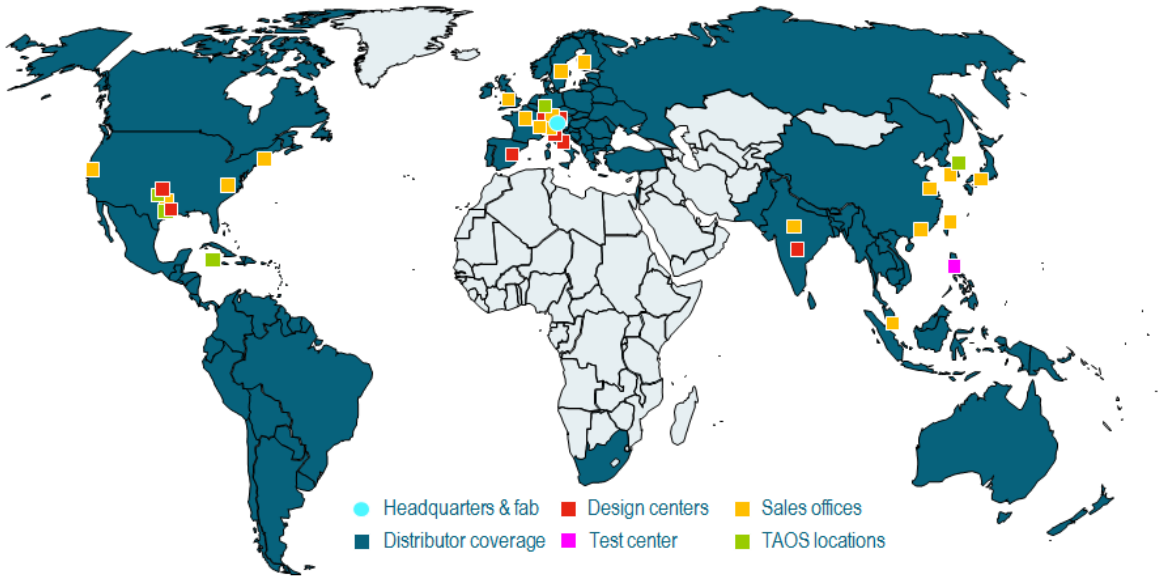
We communicate our CSR activities as well as environmental measures to customers, shareholders and the general public in an appropriate way.

Special Programs

ams has the goal to become a Carbon dioxide neutral company by 2015. This will be achieved by improving our technical systems, reducing energy consumption and compensation activities.
Furthermore, we take steps to make our employees aware of marine overfishing problems and promote fish consumption using the guidelines of the Marine Stewardship Council and Greenpeace. We also implemented the guidelines of the Forest Stewardship Council which pertain to the use of wood from sustainably managed forests.
We work together with our suppliers and subcontractors to improve environmental, health and safety activities.

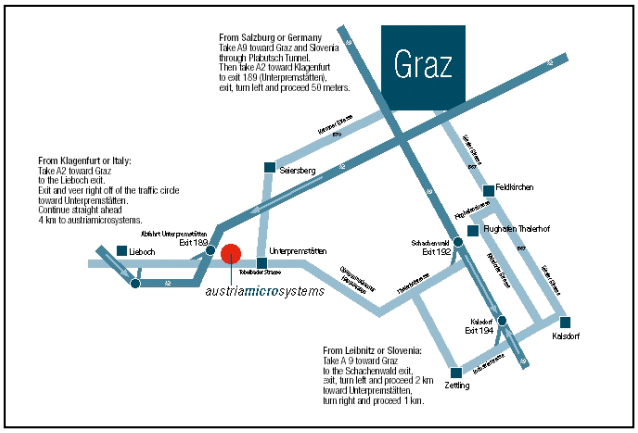
LOCATION DESCRIPTION

World Wide Network – From Design Production, Distribution and Sales



As worldwide acting company, ams has 8 designcenter (Austria, Switzerland, 2x Italy, 2x USA, Spain and India) and more than 20 sales offices. In addition we have an Asian Test Centre located in Calamba, Philippines.

Headquarter and Production in Unterpremstaetten, Austria:



The Headquarter and the Wafer production site are situated in Unterpremstätten, approx. 20 km south of Graz, nestling in picturesque castle grounds.

The castle, which is owned by the company, is subject to a preservation order, and was renovated in compliance with the relevant regulations. Office spaces are located in the castle. An interesting feature here is the chapel integrated in the castle, where christenings are still performed to this day.

The company site covers approx. 187,700 m^2, of which approx. 23,500 m^2 are used for building on an officially dedicated industrial area. The castle grounds are open to the public. In this area, there are two ponds, each with a surface area of approx. 3,700 m^2.

The castle grounds hall, part of the former church, has been suitably fitted out and can now be used as a conference centre. It is also regularly used for events by associations from the region. Other outstanding features of the location are the proximity to Graz-Thalerhof airport and a motorway link bordering on to the company site.

The eastern part of the site is situated in the extended water conservation area of the Graz area water authority. The plots of land bordering on to the industrial area in the north and east are used for agricultural purposes. The nearest local resident is situated some 50 m from the new production building.

In 2011, the average number of employees at the Unterpremstätten location was 860.

An important innovation in the past year was the construction of the second production facility (Fab B) at the location, one of the most modern manufacturing plants worldwide for the production of analog/mixed-signal ICs for communication, industrial, medical and automotive applications.

Test Center Philippines

The Test centre in Philippines is located in an Industrial Park (Carmelray Park II) about 30 km south from Manila, near the Calamba.
The test centre has been opened in 2006.

In 2011, the average number of employees at the Calamba location was 170.

New Business Unit OSL

ams merged in June 2011 with the US company Texas Advanced Optoelectronic Solutions, Incorporated (TAOS) which is based in Plano, Texas. The mission of TAOS is to redefine optoelectronic solutions to provide cost and performance advantages by creating and managing technology. TAOS is certified according to the recent ISO 9001 standard, complies with the REACH requirements and holds the Sony Green Partner recognition. Integration activities running and the full quality & environmental management integration are planned in 2013.

DESCRIPTION OF PRODUCTION

The production of ASICs is a know-how intensive process and can be described briefly as follows:

1. In the development department, circuits are designed in line with individual ideas or customer requirements. The electrical information of a component, together with schematics and function, are processed from these designs.

2. All activities in Design and Layout are carried out using sophisticated CAD/CAE tools and technologies. ams has a standard cell library at its disposal, so that only parts of the circuit have to be designed from scratch. As a result, a so-called mask control tape (pattern generator tape) is created, that is used directly for mask production.

3. In the mask production, the structures of a chip level are transferred to quartz glass plates – the surfaces of which are coated with chromium - using a high-powered argon laser. Expressed in simplified terms, the masks are used as a negative for the exposure of the silicon wafers, using step and repeat methods. An average of 22 masks is required for production of a wafer.

4. Monocrystalline, ultrapure silicon sliced into 0.7 mm thick wafers, ground and polished. These silicon wafers are brought in as raw material for wafer processing.

In the subsequent wafer fabrication, these silicon wafers are – in sequence - coated with photoresist up to 34 times, exposed, developed, and, in between, etched, coated, doped and cleaned. Here, the wafers pass through photolithographic processes combined with dry and wet etching processes, chemical and physical processes for segregation of metal and other coatings, and various cleaning processes.

5. The structures of the mask are transferred to the wafer using a stepper. With a 365 nanometre wavelength light source, the resolution is better than 0.35 micrometre.

6. To achieve the required conductivity, the wafers are doped, i.e. impurity atoms are introduced to the silicon. It's important to distinguish between ion implantation and ion diffusion here. With implantation, the atoms are more or less “fired” into a predefined wafer. Diffusion is a doping technology using heat (900° to 1200°C).

7. Before the wafers undergo further production stages, the function of all circuits on the wafer is tested.

8. The finished, tested wafers are attached to films with frames and sawn up into the individual circuits (dice) using a diamond-toothed saw blade.

9. After a visual inspection, they are stuck on to copper support frames and the contact points connected to the support frame with gold or aluminium wire (bonds).

10. For easier handling and for protection against environmental influences (dust, moisture,...), the ICs (integrated circuits) are housed in plastic or ceramic packages.
The now functional chips are then cleaned and galvanically treated* to improve the solderability (* separate process, no longer carried out in the factory).
Afterwards, the pins are punched out and bent, the package stamped and passed to final test.

11. In this test, all chips are tested again before delivery, using the very latest test computers and instruments. The test takes place according to customer specification and application. ams has the very latest test equipment's available, with the main focus on mixed-signal testing (analog and digital).

13. Afterwards, the components come to a further quality inspection and are then released for despatch.

At the end of use, our products can be handed in for recovery of the gold used in their manufacture.

The fundamental criteria for production of integrated circuits is the availability of ultraclean production areas (dust free, to clean room class 1* standard), ultrapure chemicals and gases, large quantities of ultrapure water and high precision production machinery, to be able to produce structures accurately in the sub-µm ranges.

*clean room class 1 = 1 particle per cubic foot (=28 litres) of air with a maximum size of 0.5 micrometre.

ENVIRONMENTAL MANAGEMENT SYSTEM

The environmental management system set up by ams ensures the implementation of the environmental policy and the environmental programme, and hence the achievement of the environmental objectives for continuous improvement of corporate environmental protection. It fulfils the requirements of ISO 14001, and is harmonised with the existing quality assurance system.

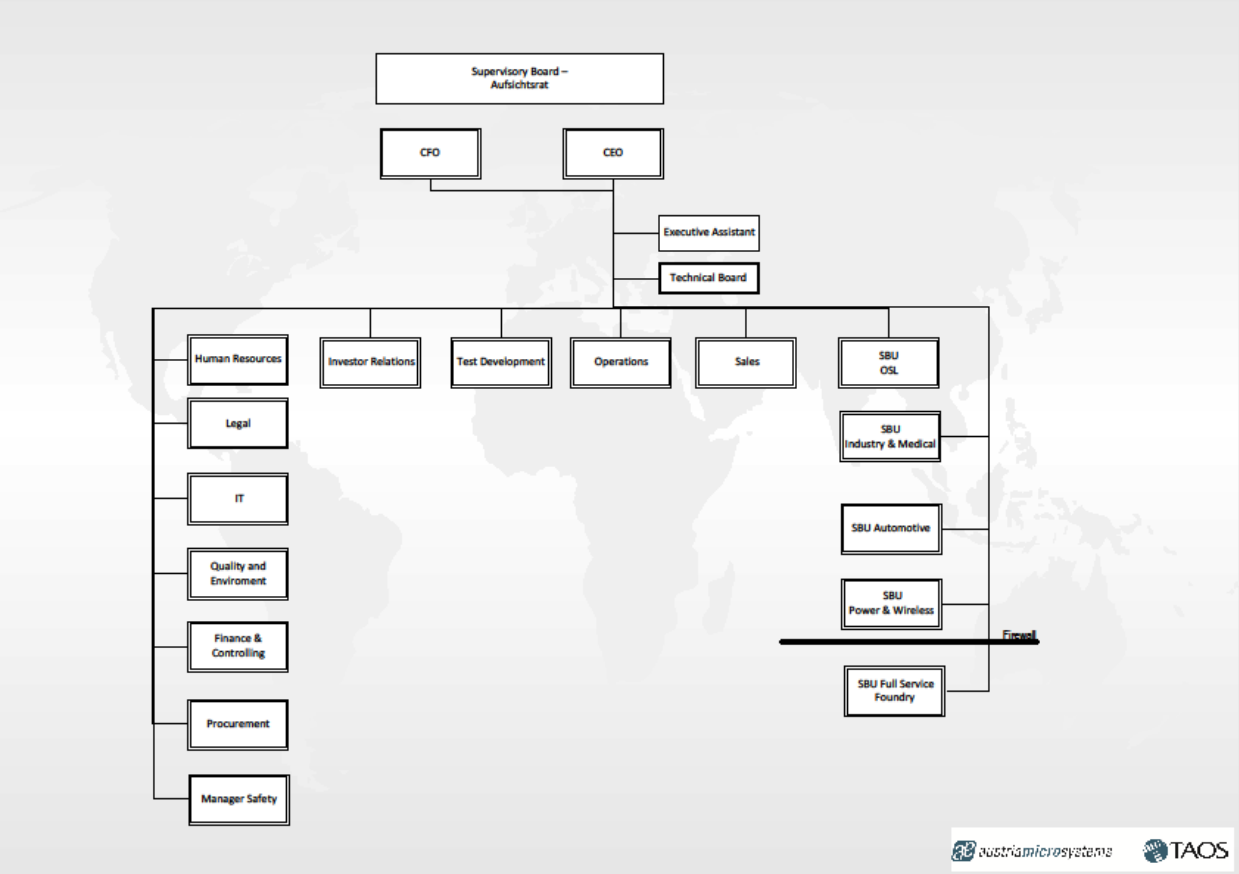
As a result, equality is achieved between environmental protection and quality assurance, and the required organisational elements can be used synergistically.

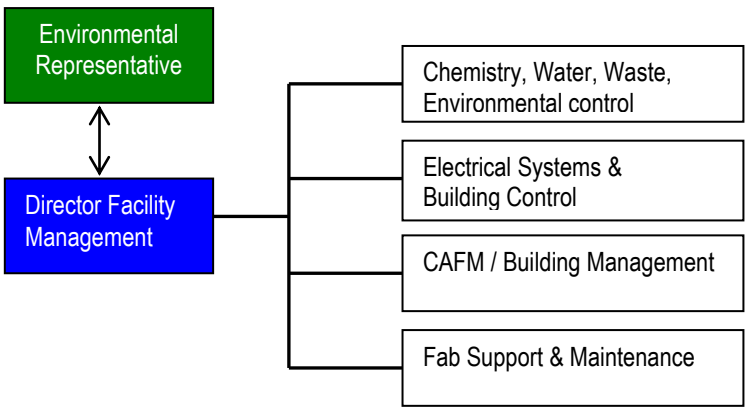
Corporate environmental protection is an integral part of the overall company policy.
Every employee carries the responsibility for environmental protection. The Management Board is responsible for setting up and approval of the environmental policy.
Further, the effectiveness of the environmental management system is checked and assessed by the Management Board in regular management reviews.

The system is subject to a dynamic process, with periodic checks, adaptations, expansions and continuous improvements.

Responsibility

ams organization diagram





Environmental Representative

The environmental representative is the person mainly responsible for the maintenance and development of the environmental management system.

At the same time the environmental representative is also the Director of the Quality and Environmental Department, directly under the executive board, and hence is established at senior management level.

His responsibilities also include checking compliance with environmental protection policy and coordination of environmental protection measures.

Each organisational unit is responsible for the application and implementation of the regulations and directives of the environmental management system in the respective area.

Director Facility Management

The director facility management is responsible for all measures for technically correct, continued operation of the entire infrastructure in accordance with all relevant legislation, for supply of various media, energy and chemicals, and for correct disposal of waste, treatment of wastewater and contaminated exhaust air.

The building services manager acts as spokesperson for the company with regard to the authorities and local residents.
He is supported by the environmental representative in the execution of higher-level duties related to the environment and the authorities.

To fulfil the duties described, the Facility department is sub-divided into several specialist operational units with the following areas of responsibility:

- Chemistry / Water/ Waste / Environmental control
- Electrical Systems / Building Control
- Fab Support & Maintenance
- CAFM / Building management

The manager of the Chemistry / Water/ Waste / Environmental Inspection area is appointed as the waste management representative and fulfils all duties associated with this role, such as preparation, updating and execution of the waste management concept.

Documentation

The environmental management system is documented:

- in the Integrated Management Manual
- in procedural instructions
- in job instructions.

Representatives organization

In fulfilment of the various rules and legislations ams has a comprehensive representative organization, which covers the following areas:

DESIGNATION	Organisational integration	Legal basis
Safety Manager	Safety	Employee Protection Act
Radiation protection representative	Building Services	Radiation Protection Act
Fire protection representative	Building Services	Workplaces Regulation
Fire protection group	Building Services	Workplaces Regulation, Health and Safety Regulations
Toxic materials representative	Building Services	Chemicals Act
Environmental representative	Quality & Environment	ISO 14001
Waste management representative	Building Services	Waste Management Act
Laser representative	Production	Health and Safety Regulations
Gas rescue service	Building Services,	Health and Safety Regulations
Hazardous materials representative	External	Hazardous Materials Regulation
Occupational medicine	External	Employee Protection Act

EMPLOYEE TRAINING

The training requirements of employees are regularly assessed within the framework of a modern employee training and development environment. The aims and training measures for the next period are arranged as well. Special training on the environment and environmental themes is provided in these higher-level staff development programmes.

ENVIRONMENTAL EFFECTS

The activities of ams in Unterpremstätten and Calamba give rise to effects on the environment typical for semiconductor factories. This includes consumption of energy, use of water, the generation of wastewater, the exhaust air from the energy centre exhaust air vents, the emissions from the various boiler plants, the steam from the cooling towers and the generation of wastes. The current environmental effects at the location for the existing plant and the anticipated environmental effects of our production line are explained in the following sections.

ASSESSMENT OF THE ENVIRONMENTAL EFFFECTS

ams has implemented a two-stage process for assessment of the environmental effects.

An internal team of experts carries out a comprehensive assessment of environmental effects using simplified risk analysis for the respective processes with the help of predetermined criteria. The result of this analysis gives rise to the environmental significance of the processes, which can be expressed

as a number. If a defined value is exceeded, an FMEA investigation (Failure Modes and Effects Analysis) is carried out for the process concerned.

In the FMEA, all relevant areas and systems undergo a detailed analysis, any weak spots are identified, assessed and any necessary actions worked out. It is also important that experts from the respective area are integrated in this team.
The assessment of the environmental effect is checked at least once a year, or else when there are changes to the process, and update if required.

PRODUCTS and RoHS, REACH

Essentially, the composition of the products of ams corresponds to the typical components required for production of integrated circuits.
As a result of the company's early implementation of European Directive 2002/95/EC for restriction of the use of hazardous substances in electrical and electronic equipment (RoHS Directive), ams is able to offer lead-free products some eighteen months before the legal requirement, and, with that, to confirm fulfilment of the RoHS Directive.
Further our products do not contain any Substances with very high concern (SVHC) according REACH Regulation.

IMDS (International Material Data System)
ams also makes its product information available in the IMD-System. This system ultimately enables automobile manufacturers to record all materials used in their product.
As a result, compliance with national and international specifications, standards and rules of law is assured.

WASTE

Waste is generated in all departments and areas (e.g. production, maintenance, development, administration, despatch) within ams.
Unavoidable waste is collected separately and, wherever possible, passed for internal recycling or external reuse.
Where waste must be disposed of, this is only done by authorized contractors.

Within the framework of the operation of the plant, the following main types of waste are generated:

- waste paper and cardboard packaging
- spent cleaning fluids (amine)
- domestic-type waste
- thermal fraction (plastics)
- solvents, photoresist (halogen free)
- sludge from the waste water treatment.

Waste separation and avoidance has long been of great interest to ams, and has been in stipulated the waste management concept for some years.

Unavoidable waste (e.g. spent acids and solvents) is separated directly at the point it is generated, and so can be transported for reuse.

WATER MANAGEMENT

ams draws the water required for production and cooling purposes from a company-owned well. Drinking water and water for sanitation purposes is drawn from the public water mains, in accordance with the requirement of the authorities.

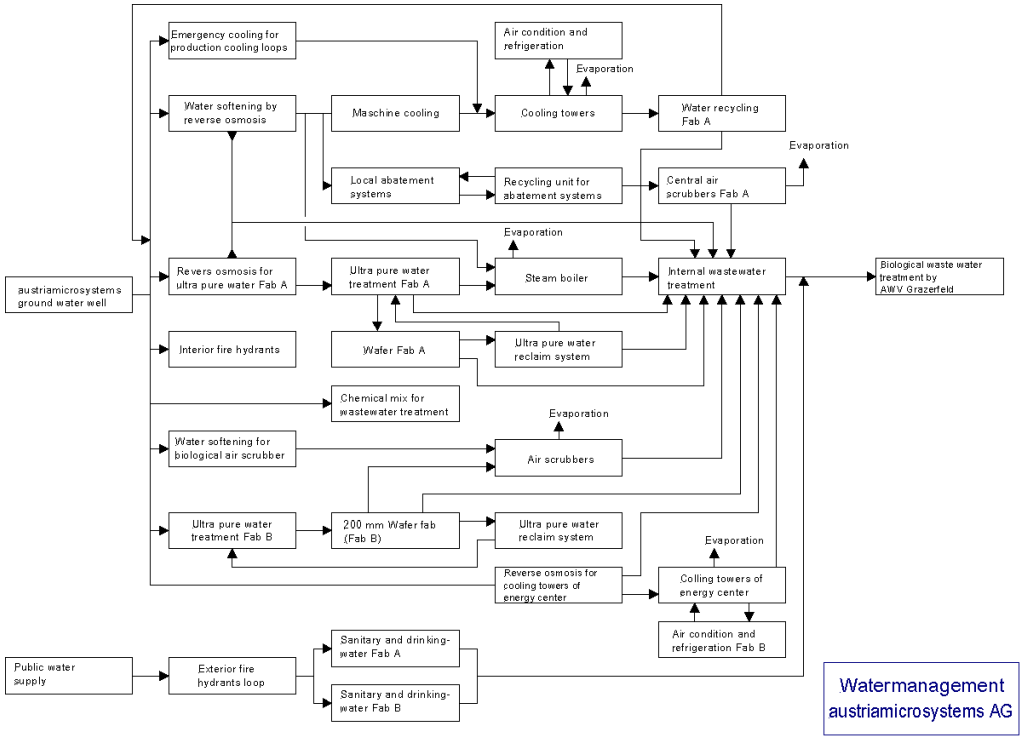
The well water is used for production of fully desalinated water (ultrapure water/deionised water) and partially desalinated cooling water.

The partially desalinated water is treated using mechanical filtration and subsequent reverse osmosis processes. It is used for cooling part of the production machinery and, later on in the sequence, as feed water for the cooling towers.
Since the completion of the recirculation loop in 2003, up to 85 % of the cooling water, which is heated up by several degrees and is free of contaminants, is returned to the water supply system, and hence reused (return into the well water holding tank). Part of the cooling water is evaporated in the cooling towers.

In the winter months, the steam emissions that occur here are avoided by the operation of free cooling. With ambient temperatures below 5°C, no water is evaporated from the cooling towers, so that the formation of “industrial snow” is prevented.

The fully desalinated water is produced using mechanical filtration, reverse osmosis and multi-stage ion-exchange processes. The water is used in production for various cleaning purposes. Contaminated wash water is, to some extent, reprocessed within the company, and hence used several times.

The complexity of the water management system in Unterpremstaetten is illustrated with the aid of the diagram.



As a result of the typical production methods in semiconductor manufacture, the wastewater contains the remains of the acids, developers, caustics and chemical preparations used.
The production water is separated according to its contamination, and then collected and treated.

As far as is technically possible, the contents are removed using physical and chemical processes. The most important treatment process is the precipitation of the contents followed by filtration. After this separate treatment, the various water-flows are neutralised together and, after a final inspection, discharged into the municipal wastewater system for final purification (elimination of nitrogen). The concentrations of the contents are monitored by regular measurements.

Adequately sized holding basins are available for operational problems and for balancing the fluctuating quantities of wastewater. This allows support for the optimal hydraulic loading (water inflow) of the municipal clarification plant and achieves comparability in the sense of the water legislation.

The chemicals storage area and handling zones are drained via floor apertures into the holding basins of the water purification plant, so the negative environmental effects of any accidents can be avoided. Water used for sanitation purposes is discharged into the municipal sewerage system.

Surface water is kept separate from the wastewater and is discharged into the company-owned ponds. These ponds also act as holding basins during heavy rainfall, and as a fire fighting water reserve in the event of fire, or as holding basins for any water contaminated from fire fighting. The company ponds are situated in a clay base that is nearly impermeable to water. As a result, subsequent treatment of any contaminated water would be possible if necessary, as any seepage is precluded.

ENERGY MANAGEMENT

The energy requirements of ams are covered by electrical energy and natural gas.

Natural gas is used for generation of hot water and low pressure steam and for afterburning of exhaust gases. This heat energy is used for fresh air heating, air humidification (air conditioning), building heating and for operation of the absorption refrigeration plants.

The main consumers of electrical energy are:

- Air conditioning, maintenance of the clean rooms required for production in compliance with the specified “climatic” conditions
- Production machinery (diffusion furnaces, sputter systems, implanters, ...)
- Operation of support systems (such as water purification, water treatment, compressors, nitrogen production plant).

The use of an alternative clean room concept, so-called mini-environments (areas encapsulated against the surroundings, in which the silicon wafers are processed) significantly reduces the energy consumption. Conventional type clean rooms use approximately three times the amount of energy for maintenance of the clean room in comparison to mini-environments. The realization of a mini-environment clean room concept in the new Fab B production facilitates this optimum energy use.

Emergency power supply systems and a number of UPS units provide high reliability of the energy supply.

EXHAUST AIR EMISSIONS

The exhaust air emissions arising can be assigned to the following sources of emission:

- steam boiler plants
- hot water boiler plants
- exhaust air cleaning systems for cleaning the exhaust air from the production areas (central exhaust systems)

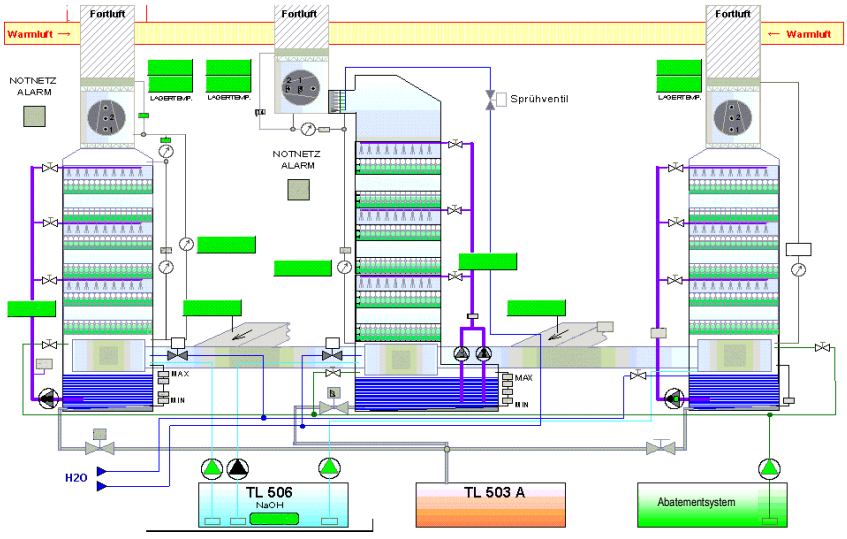
The steam and water boiler plants are natural gas-fired. As a result of the environmentally friendly fuel and the use of modern low NO_x burners, the exhaust gas test values are clearly below the legally prescribed limits.

Cleaning of the exhaust air from the production processes currently takes place in Fab A via four exhaust air washers ("wet scrubbers") and two fixed bed absorbers ("dry scrubbers"), together with 4 exhaust air washers in Fab B. A bio-reactor is used in Fab B to reduce the exhaust air with any organic contamination in the exhaust air. In the first stage, the solvents used are dissolved in water (counter flow absorption process). After this, aerobic bacteria convert the solvents dissolved in the water to CO_2 and water.

Up to the bio-washer, all exhaust air washers are designed with built-in redundancy. An action plan is defined for cases where the bio-washer has a technical problem.

Typical contaminants in the exhaust air before the washers are vapours and aerosols of various acids and solvents used, together with water-soluble gas residues from the plasma etching processes after having passed local abatement systems .

Exhaust air purification diagram:



Method of operation:

"Wet Scrubber": the pollutants contained in the exhaust air are washed out in a counter current absorption tower with three spray levels. This process is suitable for all acid and alkaline exhaust gases and aerosols, and for all water-soluble biologically-degradable solvents. The wash water is renewed automatically using pH resp. conductivity control. Purification of the wash water takes place in the in-house wastewater treatment plant, followed by neutralisation and discharge into the biological clarification plant.

Process exhaust gases are converted into water-soluble reaction products in a preliminary stage in local precleaning systems (chemically oxidative and thermocatalytic). This pre-cleaned exhaust air is conveyed to the wet scrubber for final cleaning.

"Dry Scrubber": these fixed bed absorbers bind the oxidisable pollutants to an oxidising granulate in solid form. This solid material is handed over to a licenced waste disposal company and must be classified as suitable for landfill disposal on the basis of an eluate analysis.

As a result of all these treatment operations the emissions from the exhaust air purification systems are always clearly below the officially prescribed limits.

PFCs and HFCs are removed from the exhaust air using local exhaust air purification systems ("Abatement Systems").
In addition, this pre-cleaned exhaust air is taken through the main absorption systems, where the previously oxidised products are separated.

- PFCs / HFCs are perfluorocarbons or hydrofluorocarbons that, according to the Kyoto Protocol (greenhouse gases), are largely responsible for the greenhouse effect. These industrial gases, along with carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, nitrogen fluoride and halons, are among the substances causing climate change or global warming, by increasing the "natural greenhouse effect".

NOISE

Disturbing noise emissions are unheard of. This has also been confirmed by measurements carried out in the neighbourhood of ams by independent experts.
Noise for employees is minimised by taking sound insulation measures directly at the production machinery and by favourable positioning of the plant with regard to noise.
Furthermore, other measures to reduce noise pollution on the company site and for local residents have been taken voluntarily, for example the construction of a sound-insulating wall along the motorway.

GROUND CONTAMINATION

As the site was used for agricultural purposes before the company was established, ground contamination can be ruled out.
Since ams came into being, any ground contamination can be ruled out with absolute certainty, as a result of the precautions taken (e.g. retention basins, heavy reinforced concrete method of construction, defined drainage systems).

RISK MANAGEMENT

Appropriate measurement, inspection and safety systems are in place to ensure high reliability of the environmental protection systems.
ams is not subject to the IPPC Directive and is not a "hazard-inclined" plant in the sense of the Health and Safety Regulations, as the actual values fall clearly below the quantities and limits prescribed in these regulations.

A multiplicity of safety installations, such as retention basins, smoke alarm and sprinkler systems, gas sensors, etc. are available in the event of a problem. The redundant design of important systems and plant applies equally to ams's environmental and safety philosophy.

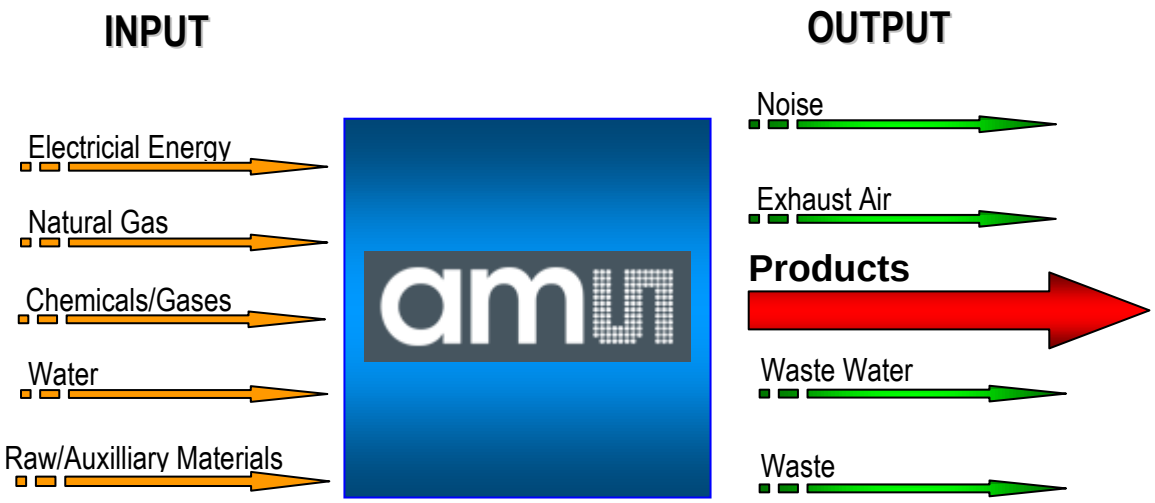
Liquid chemicals are held in suitable storage areas with retention basins that drain into the holding basins of the wastewater purification plant.
The gas store is equipped with gas detectors for toxic gases, which automatically activate a built-in air purification system.
Chemical handling takes place on suitable surfaces that are equipped with floor apertures linked to the wastewater purification plant. As a result, uncontrolled effects on the environment are excluded should an accident occur when handling chemicals.
The wastewater purification plant is equipped with holding basins. In addition, internal alarm limits are specified for wastewater emissions that are below the officially prescribed values. The effectiveness of the wastewater plant, as are all other critical parameters (e.g. pH value) is monitored by the plant process control system.

The strict conditions with regard to fire protection and plant safety imposed by the industrial plant insurance company FM Global (Factory Mutual) – who operate internationally - are fulfilled. For some years, ams has been classified as a “highly protected risk” (highest safety classification). All areas in the company are covered by sprinkler systems and/or fire alarm systems, or by special fire extinguishing systems (inergen extinguishing systems, foam extinguishing systems.

The supply to the sprinkler systems within the factory comes from three redundant sprinkler pumps, each with an associated water reservoir.
Currently around 10,000 data points are acquired, visualised and recorded by means of a modern building control / building management system.
In the event of an alarm, the appropriate company emergency services are notified via modem from this building control / building management system, which also performs an emergency shut down where necessary.

A standby team consisting of experienced employees who can be contacted round the clock, enables immediate and competent actions to be taken in the event of any emergencies.

The reception is manned by technicians round the clock as well. They carry out regular inspection patrols and can take immediate action in the event of deviations or alarms.
They monitor the factory by means of the central building control system, fire alarm systems and site surveillance systems.
Individual risk analyses (FMEAs = Failure Modes and Effects Analysis) are performed for all areas where a risk exists.



Environmental Relevant Data 2011

The Environmental Report 2011 gives an overview of media and materials used and the company‘s environmentally relevant effects in the year 2011. Comparison with the previous year gives an insight into the efficiency of all environmental protection measures taken.
Compared to 2010 are just slight consumption changes.

Increases in the quantities of media and materials used can be attributed to the continuous expansion of the capacity at the location. A strong focus is reducing our carbon dioxide emissions.

Legal Compliance

In 2011 there were no complaints made to ams from either the authorities responsible, the community, or the local residents in regard to any environmental damage or on account of other negative effects. No processes are being operated that cast doubts on the company’s legal conformity.

Amendments / Special Features

In 2011 we continued our carbon dioxide emission reduction program. After the first step, the evaluation of all carbon dioxide emission in all production sites (UPS and Calamba) including transportation; we evaluate state of the art reduction possibilities on technical level. Additionally we check possibilities to become totally CO_2-neutral. We have a very clear goal, becoming a carbon neutral company!

Highly Protected Risk certification: Since 1 January 2005, the factory at the ams site in Unterpremstaetten has been classified by FM Global, a worldwide insurance company, in the Highly Protected Risk category. This clearly demonstrates the particularly high degree of risk prevention ams has implemented.

In 2009 ams joins the UN Global Compact initiative. The UN Global Compact is the world’s largest corporate initiative for responsible business and sustainability. Over 8,700 participant organizations in more than 130 countries share the UN Global Compact commitment to ten principles in the areas of human rights, labor standards, environmental protection and anti-corruption measures. This commitment also encompasses the efficient use of energy and resources, highest environmental standards, fair labor conditions and ethical business practices.

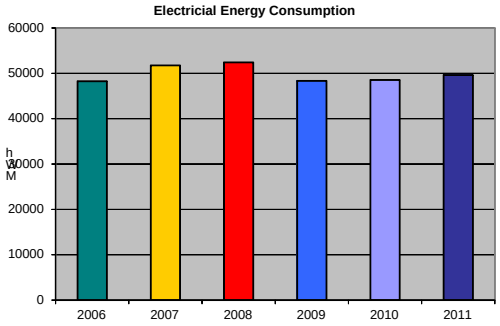
Therefore we updated also our existing environmental policy and developed a new Corporate Social Responsibility Policy which includes environment.

Input

Electrical Energy

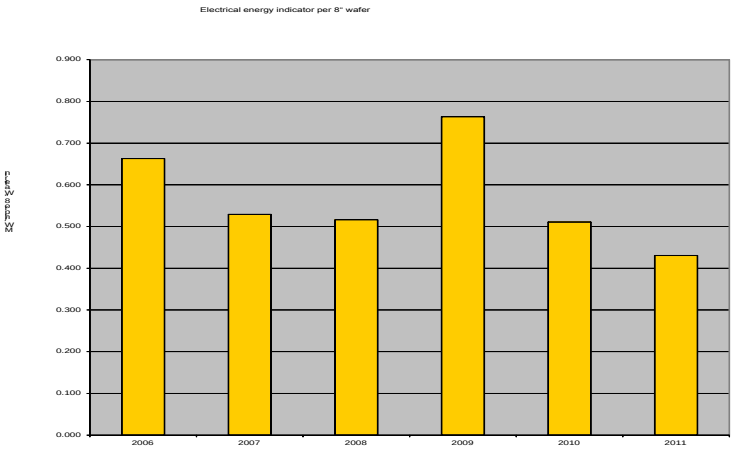
The consumption of electrical energy was 49 613 MWh.

As compared to 2010, increase in production of 17% caused a slight increase of energy usage by 2.2% in 2011. The reason is energy efficient activities in our fabrication.



Electrical energy indicator per 8“wafer

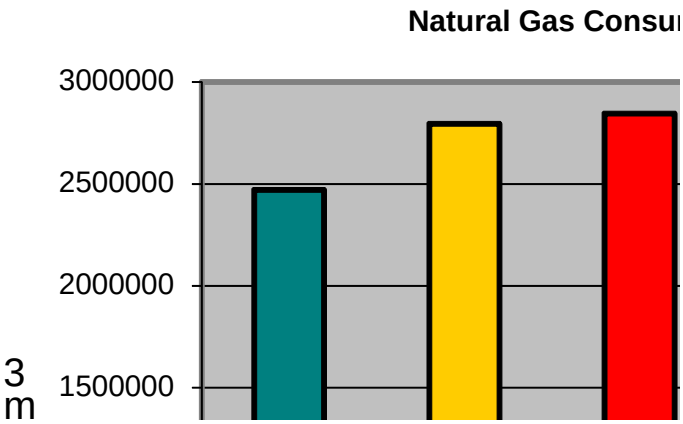
Related to the 8” wafer equivalents produced on site which were started in production, an average of 0.43 MWh per wafer was consumed in 2011. Compared to 2010, this represents a decrease of 16 %, which can be attributed to increased load of production and our running energy efficient program.



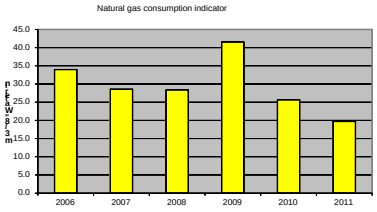
Natural gas consumption

In 2011 the natural gas consumption was 2 273 040 m^3.

This represents a 6.7% reduction in comparison to 2010 despite the increased load of production. The reason is energy efficient activities in our fabrication.
Additionally, natural gas consumption is very much dependent on climatic conditions and can only be controlled to a small extent.

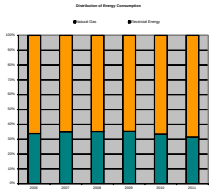


Natural gas consumption per 8“ wafer



There was a decrease of 23% in the natural gas consumption compared to 2010 which can be attributed to the increased load of production. Natural gas is used for heating in all areas on site. Also for maintaining the clean room conditions.

Distribution of energy consumption by energy source



The possibility of choosing between natural gas and electrical energy sources in the operation of Different refrigeration plants has the advantage of being able to cushion any load peaks that may develop. The increased use of electrical energy was selected because of the lower price of electricity compared with higher costs of natural gas.

Gases

Nitrogen

The consumption of nitrogen in 2011 was 9 514 757 m^3. This represents a decrease of approximately 9% compared with the previous year. Liquid Nitrogen is not only used for production equipments, it is also used for maintaining the storage conditions.

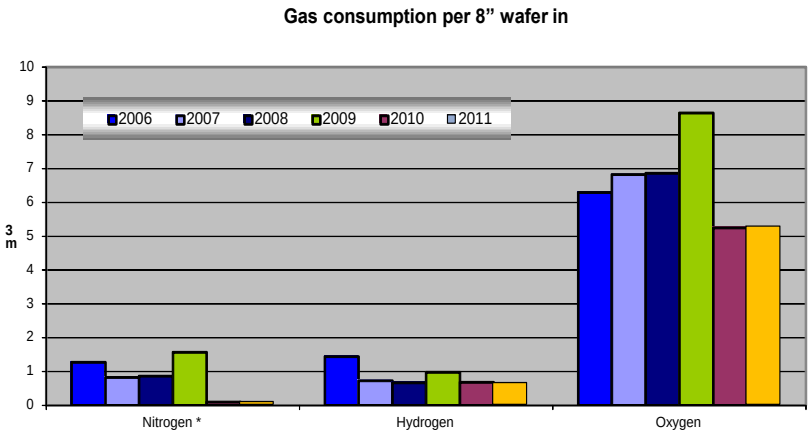
Hydrogen

The hydrogen consumption in 2011 was 74 213 m^3. There is an increase of 4% compared with year 2010. Hydrogen is also related to the increased load of production. Differently to nitrogen, hydrogen is used for production, only.

Oxygen

The consumption of oxygen in 2011 was 607 709 m^3. This 11 % increase in consumption compared to 2010 is due to the increased load of production as well. Many new technologies need oxygen for their operation.

Gas Consumption

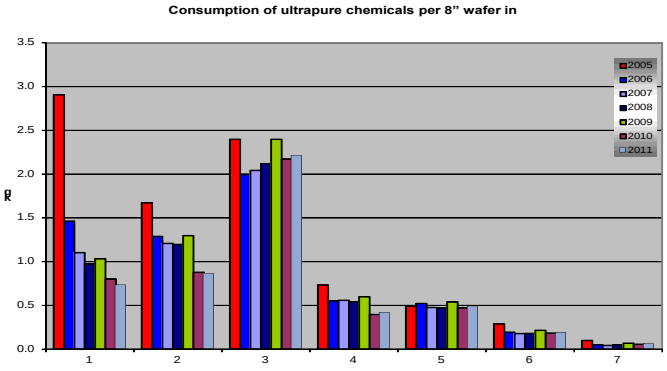


*Nitrogen x 100m^3

Operating Materials

Liquid chemicals and process gases still account for the largest quantitative share of operating materials. Raw materials and semi-finished products make up a relatively small share.

Ultrapure Chemicals



1. Acids
2. Hydrogen peroxide
3. Photo chemicals
4. Alkaline solutions
5. Organic solvents
6. Process gases
7. Salts

Due to the increased load of the production, the consumption of most ultrapure chemicals has also increased. The total amount of used chemicals was higher than previous years. But in relation to produced wafers, the relevant consumption of ultrapure chemicals is decreased.

The following quantities of chemicals were required for preparation of ultrapure water, wastewater treatment and exhaust air purification:

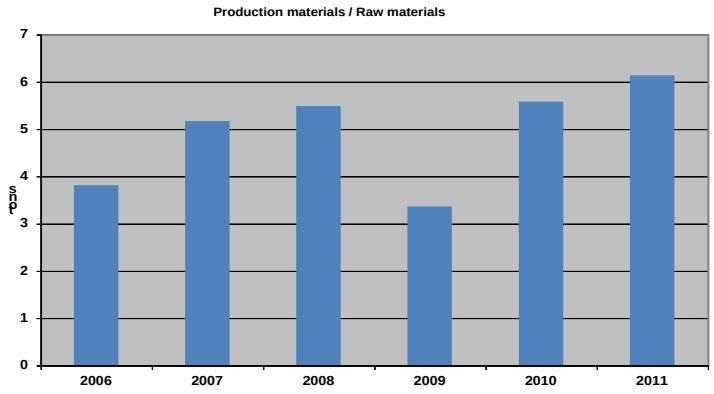
Chemical used in the preparation of water

Reporting Year	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Industrial Chemicals (t)	*645.1*	*572.9*	*642.6*	*649.6*	*522.9*	*556.3*	*539.7*
Calcium hydroxide (t)	*84.6*	*64.5*	*80.4*	*90.1*	*72.5*	*84.7*	*84.1*

The increase requirement for industrial chemicals can be attributed to the increased load in production.

Production materials

The chart below quantifies the production materials used:



The increase of consumption of Silicon was also depending on the load of production site.

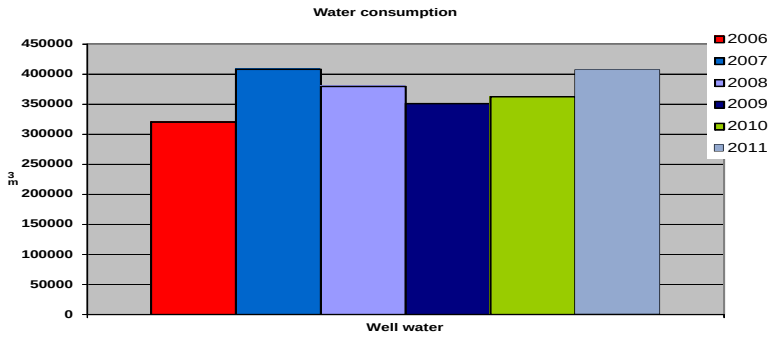
Due to assembly outsourcing, moulding compound (epoxy resin) and copper are no longer used at the location. All external assembly companies (sub-assemblers) selected by ams have a valid ISO 14001 certification.

Water

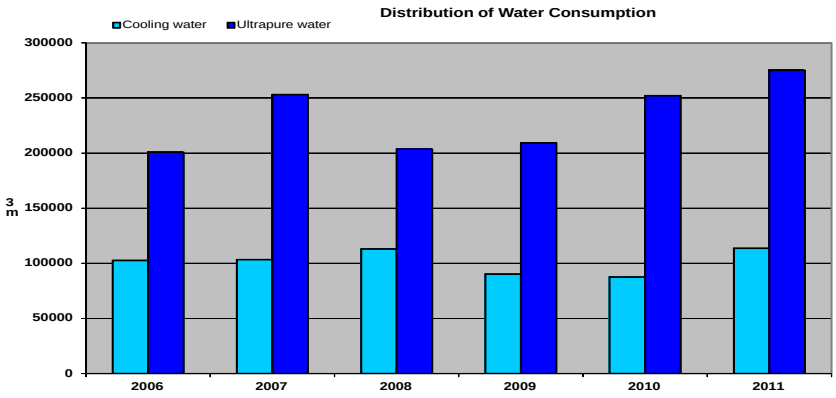
In the year 2011 under review, ams drew 406 550m^3 of water from the company-owned filter well. 4313 m^3 of drinking water was drawn from the public water mains.

The water drawn from the company-owned well is needed for production of deionised water (ultrapure water), softened cooling water, filtered process water and boiler feed water.

Water Consumption



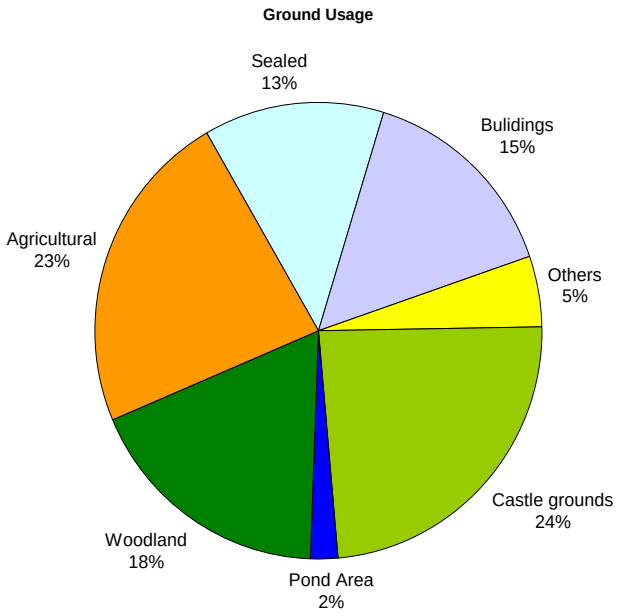
Distribution of Water Consumption by Cooling Water/Ultrapure Water



More than 98% of the total cooling water is recirculated. The consumption of ultrapure water is quite stable. The increase of consumption of ultrapure water from 2009 to 2010 can be attributed to a higher product capacity.

Ground usage/Infrastructure

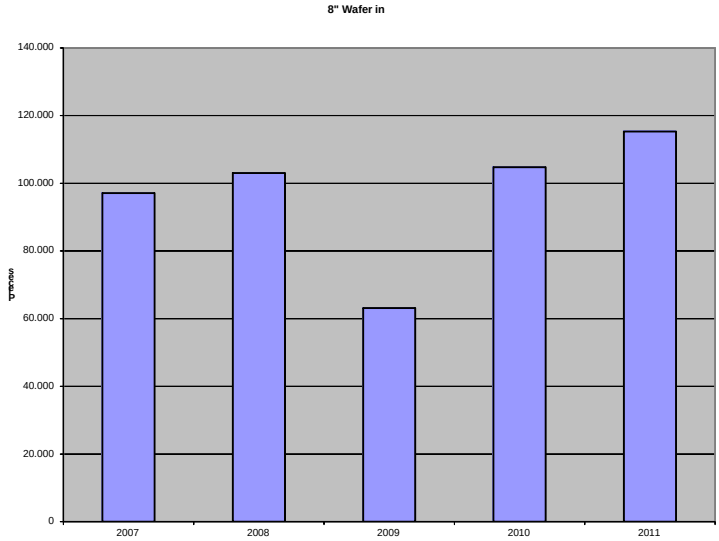
The overall area of the ams site is 187 700 m^2. Of this, some 24 700 m^2 are authorized to building use and approx. 28 000 m^2 to sealed areas. Some 45 000 m^2 of parkland are open to the public. The remaining areas are used for agricultural purposes or are wooded.



Output

ams produces integrated circuits (ICs) for the most varied applications in the automobile industry, and for the communications, industrial electronics, medical and health fields. The ICs are supplied in plastic or ceramic packages.

200mm Silicon Discs (8” Wafer-In) Started in Production



The description ‘wafer’ show how many wafers (silicon discs) were started in production in the respective years. The 200 mm production (Fab B) has been operating at the Unterpremstätten location since 2001, since when the capacity has been progressively increased.

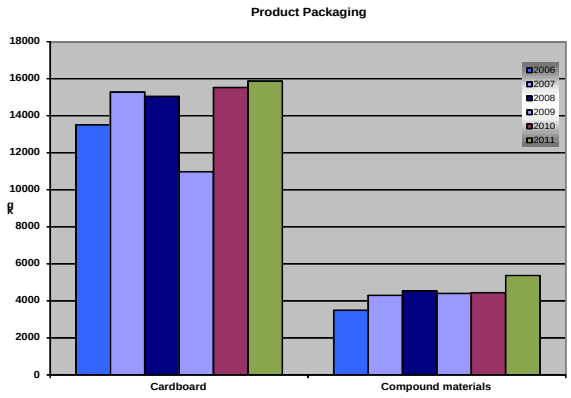
Taking account of the various reductions (test wafers, process set-up wafers, wafer breakages), the number of wafers started in production also gives the output at the same time.

In 2011 there was an increase in load of the wafer production.

Product packaging

In year 2011 the following quantities of packaging materials were used in Austria for product shipping:

Cardboard	approx. 15 870 kg
Compound materials	approx. 5 371 kg



The increase usage of cardboard packaging can be attributed to increased production volume and the associated additional packaging required for the transportation of components.

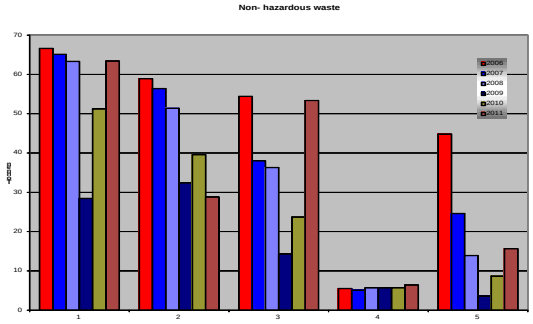
Waste

Non-hazardous waste amounted to 147 tons.

In 2011, around 244 tons of hazardous waste was passed to waste disposal contractors licensed to handle hazardous waste or sent to an external recycling plant.

21% of the total waste generated in 2011 was sent for recycling and 28% of total waste was used for thermal usage.

Non-hazardous waste

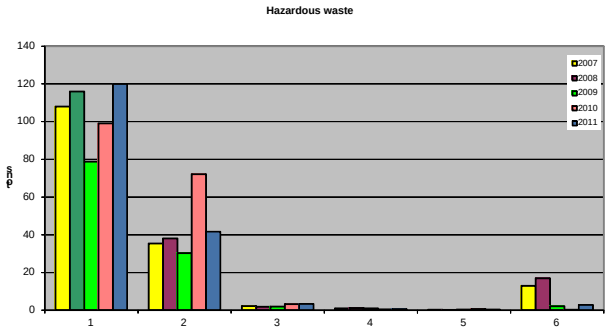


1. Waste paper and cardboard packaging (R)
2. Domestic and trade waste (D)
3. Plastic waste (T and R)
4. Biological waste (R)
5. Wood waste (T)

D: for disposal
R: for recycling
T: thermal usage

The increased quantity of plastic waste in 2006 (shown in item 3) can be attributed to t the removal of old pipes regarding shut down of Fab A. The decrease of waste in the other categories can be attributed to an optimization in waste segregation and a reduced load of the production. For wood waste, less new equipments was purchased in 2009.

Hazardous waste



1. Sludge from wastewater treatment (D)
2. Halogen-free solvents (T)
3. Workshop waste (T)
4. Waste oil (T)
5. Batteries, rechargeable batteries (R)
6. Aliphatic amines (T)

D: for disposal, R: for recycling, T: thermal use

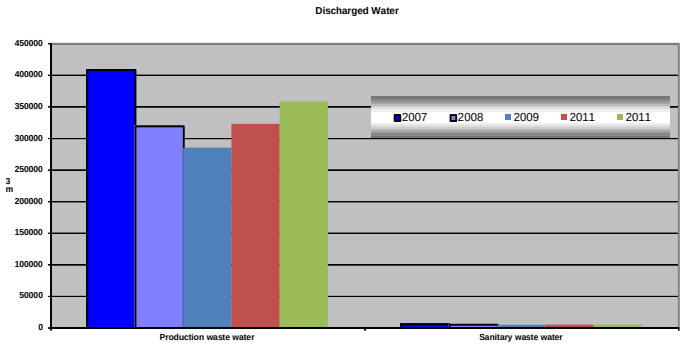
The increase of hazardous waste is attributed to a higher load of production and process optimization. (e.g. usage of aliphatic amines in production) compared with 2009. The increase disposal on halogen free solvents in 2010 is regarding reconstruction of cooling water systems. The 0°C cooling water pipes has been removed and the glycol-water mixture had to be disposed.

Wastewater

The wastewater produced is chemically and physically cleaned in the company-owned wastewater treatment plant and then discharged into the Grazerfeld Wastewater Authority's clarification plant for further treatment (nitrogen elimination).

The progressive increase in wastewater quantities can be attributed to the steady increases in capacity of the new production facility. On a self-monitoring basis, wastewater emissions are checked on a daily, weekly and monthly basis, in line with conditions imposed by the authorities.

Independent experts check the effectiveness of the wastewater treatment plant twice a year. This inspection includes, amongst other items, checks on parameters such as adsorbable organic halogens (AOX), hydrocarbons, tensides, chlorine and highly volatile organic hydrocarbons. All values are significantly below the officially prescribed limits.



The increased wastewater volume can be attributed to a higher load in Fab B. Additionally we was able to increased recycling ratio for ultrapure water.

Air emissions

In 2011, the total flue gas emissions due to operation of the boiler plants (four steam boilers, five heating boilers) was 40.8 million m^3. Due to the type of fuel used, and the low NOx burners, the levels were well below the emission limits. This has been verified by measurements taken by independent experts. Because of the relatively low boiler ratings and low utilisation rate the company is not subject to the conditions of the Emissions Certificate Act.

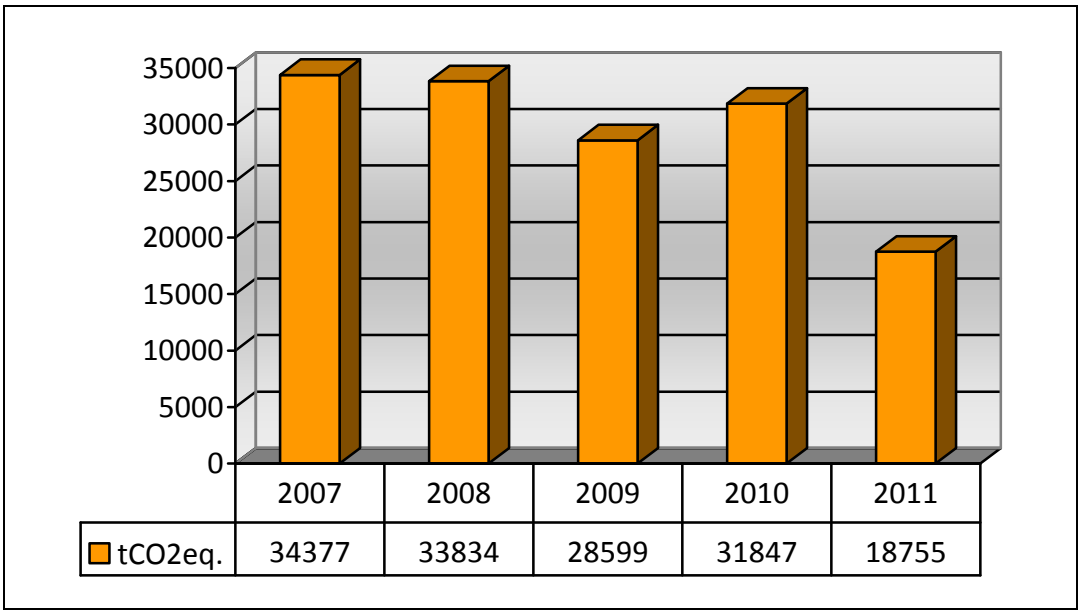
Sulphur dioxide (SF6), nitrogen trifluoride (NF3), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs) are major contributors to the greenhouse effect (Kyoto Protocol). There is no substitute for these process gases in the core processes of the semiconductor industry, as no evaluated replacement processes or alternative gases are available. However, ams tries to keep the use of these gases as low as possible, to use process gages with a minimum greenhouse potential and, primarily, to minimize the emissions by means of special abatement systems (exhaust gas cleaning by controlled afterburning in a closed system). All relevant process plant in Fab B is fully equipped with this type of system.

Depending on the exhaust air cleaning technology employed, up to 95% of the quantity used is burnt. ams fulfils the requirements of the Austrian legislature, with the reduction of at least 30% of the emissions related to the annual quantity used at the location.
The reduction of PFC's in year 2011 was 92%

In addition, ams is also a signatory to the Memorandum of Agreement of the European Electronic Component Manufacturers Association (EECA), in which the company undertakes, in the same way, to reduce the output of PFCs and HFCs. As a result, ams is making its own contribution to the Climate Protection Protocol agreed in Kyoto in 1997.

Carbon dioxide Balance

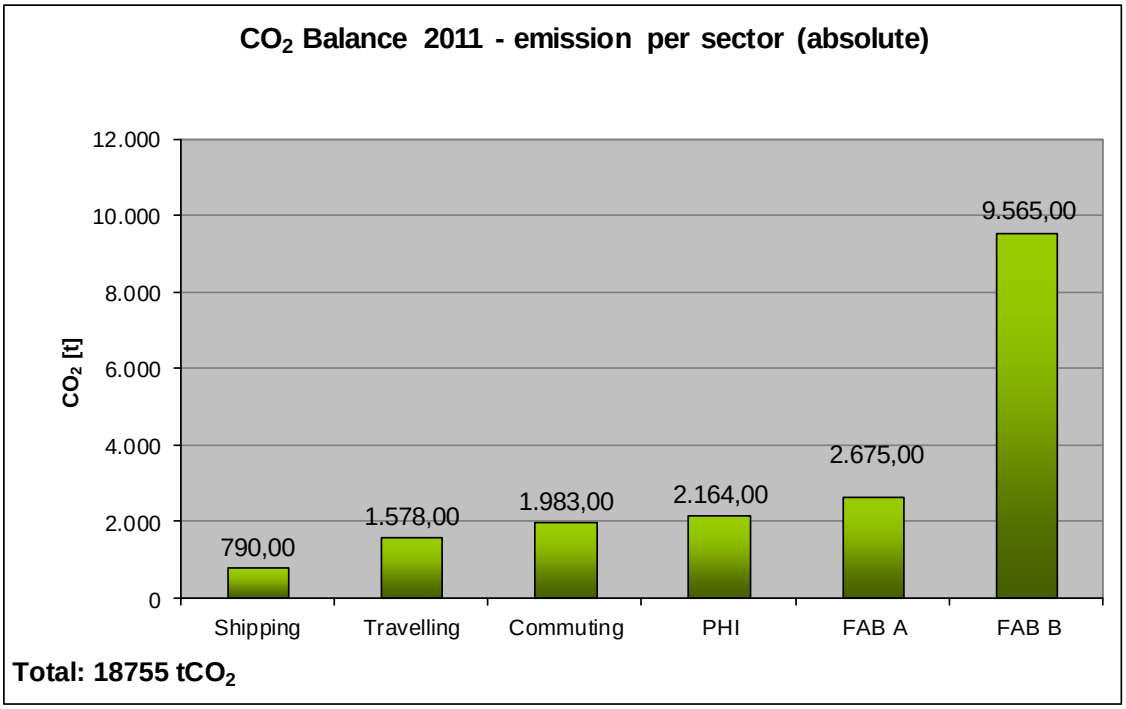
In order to optimize ams carbon dioxide balance sheet by minimizing the impact of machinery and company employees, ams initiated a greenhouse gas (GHG) project. The initial goal of this project was to make a GHG inventory of primary and secondary emissions sources. The project included identifying, analyzing and evaluating all company related GHG activities. It required calculating the resulting emissions from primary and secondary energy sources, business travel, everyday employee commuting and product shipment. The purpose was to create an overall balance sheet in order to determine the main contributors, to evaluate the mitigation potential of different influences, and develop a list of possible short term and long term measures which allows optimizing the greenhouse gas (GHG) balance sheet.
The assessment will update every year.



ams runs a progressive CO_2-Reduction program. Despite an increase in production load, due to different technical improvements, we were able to reduce our total Carbon dioxide equivalent emissions. Next additional technical improvements different reduction and offsetting possibilities are under investigation. Our middle term goal is become a totally carbon neutral company!
Since 2011 ams buys renewable electricity made of 100% hydropower.

Carbon dioxide emissions per Scope:

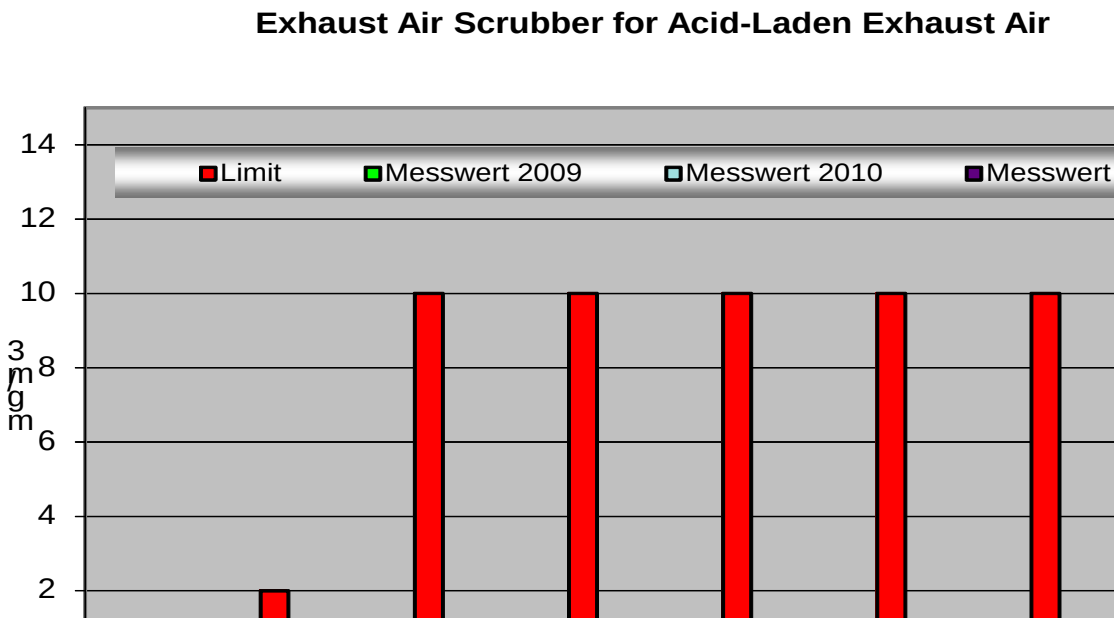
The diagram shows that the main CO_2 Emissions comes from production site in Unterpremstaetten. Despite high energy consumption, also a lot of process gases were used during the production process.

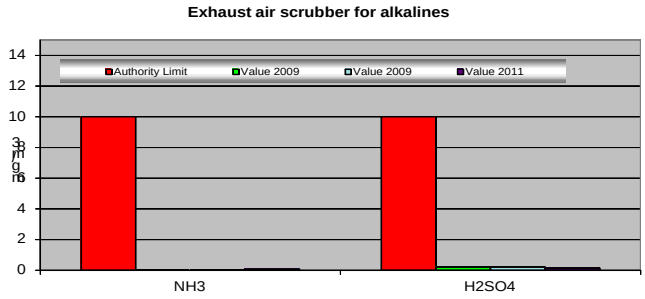


Exhaust Emissions

All measurements were taken by the Steirische Gas-Wärme GmbH (Styrian Gas Heating Co.) over the period from 4 and 5 August 2011.

Emissions measurements after exhaust air scrubbers – Fab B





As is clearly shown in the “Emission Measurements after Exhaust Air Scrubbers” charts, all measured values are well below the officially prescribed limits.

Boiler plant emission measurements

		Overall assessment value in mg/m³ at 3% O_2			
	Power (MW)	CO	NO_x	C1	Aerosol
Limit * in mg/m³		100	***	****	10
Steam boiler 1	1,4	1	114	< 2	<1
Steam boiler 2	1,0	1	115	< 2	<1
Heating boiler 1 (Fab A)	1,74	3	154	< 2	<1
Heating boiler 2 (Fab A)	1,74	4	149	< 2	<1
Heating boiler 3 (Fab A)	2,91	1	138	< 2	<1
Limit ** in mg/m³		80	120	****	10
Heating boiler 4 (Energy Centre)	2,9	1	96	< 2	<1
Heating boiler 5 (Energy Centre)	2,0	1	63	< 2	<1
Steam boiler 3 (Fab B)	0,86	29	108	< 2	<1
Steam boiler 4 (Fab B)	0,86	5	109	< 2	<1

* Limit in accordance with LRG-K (Clean Air Act for Boiler Operations) and LRV-K (Clean Air Act for Boiler Plant) for existing systems in mg/m³ at 3 % O_2

** Limits for newly installed boiler plant in accordance with LRG-K and LRV-K

*** LRG-K does not specify a defined limit. The low NO_x burners installed ensure that statutory requirements are met.

**** No limit specified, as the fuel used is natural gas.

Measurements were taken by the Steirische Gas-Wärme GmbH (Styrian Gas Heating Co.) on 21st and 22nd December 2011

In addition, approx. 2,000 litres of diesel fuel were used in 2011 for the operation of the UPS systems and sprinkler pumps.

Indirect environmental aspects

We also realise the importance of ensuring that our contractual partners employed on site are duty bound to comply with our strict environmental regulations. All external companies, suppliers and external service personnel can only go about their duties after they have received instruction covering both safety rules and the environmental regulations applicable at the location.

ams provides a private company bus for its shift workers. This company bus operates several times a day following the shift pattern, running between the primary catchment area for shift workers (West Styria) and the works. This avoids each employee having to drive to work in his own car.

Private cars are used to transport our products (particularly small quantities) to the airport close by, so reducing the number of empty truck movements.

Similarly, an assessment of environmental performance is made when selecting our suppliers and bought-in products.

The expansion of the in-house video-conferencing facility has led to an increased use of this communication option for meetings, so reducing the number of long journeys.

When selecting our suppliers, ams is now demanding that key suppliers run an environmental management system certified in line with ISO 14001.

Increased efficiency and optimisation of environmental and quality issues have been advanced by harmonising our business processes. This has been achieved primarily by making use of available synergies.

By managing to implement the RoHS directive 2002/95/EG (Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) very early within the company, ams has been able to provide all products in compliance with the RoHS directive since the being of 2005.

Since 2004 ams is Sony Green partner. This meant introducing an upstream management programme (the full value-added chain of a product under analysis). This has helped to exclude the product being contaminated by certain substances.

ams supports the Marine Stewardship Council (MSC) and Forrest Stewardship Council (FSC) Activities. Further we changed the “normal” copy paper to “blue angel” copy paper which is made of 100% recycling fibres and limit a lot of dangerous chemicals.

Environmental Programmes:

In order to have a successful continuous improvement, ams develop an environmental program annually. Every year the programme will be reviewed and assessed. We have programmes for our productions site in Austria, Unterpremstaetten and for our Testhouse in Philippines, Calamba.

Environmental Program 2010 – Austria – Review

Aspect	Environmental Target	Activities	Deadline / Responsibility	Implementation
CO_2 EMISSION	Reduction of CO_2 Emissions	Final planning for biomass power plant including application for relevant authority approvals.	Q3/2011 Facility Department	Done, including emission expert statement Q4 / 2011
		Start reforestation program in Uganda. Contact relevant persons in Uganda and define areas.	Q3/2011 Quality & Environmental Department	Done, prefeasibility study is performed with öbf 2012
		Analyze abatement tool efficiency by an independent laboratory.	Q3/2011 Facility Department	Done by Fresenius Dresden. Increased treatment efficiency
	Become CO_2- neutral company until 2015	Develop a Roadmap which leads austriamicrosystems AG to CO_2–neutrality.	Q3/2011 Quality & Environmental Department	Done, roadmap is published in Intranet
	Avoid > 9000 tons indirect CO_2 emissions caused by electrical energy consumption	Buy 100% green electricity from energy supplier.	Q3/2011 Facility Department	Done, contract with Unsere Wasserkraft GmbH till 2014 signed.
ENERGY	Further reduction of natural gas consumption for cooling in 2011 of >10% compared with 2010.	Optimize utilization of existing chilling systems and avoiding operation of absorption chillers.	Q2 / 2011 Facility Department	Done, but reduced reduction rate due to weather conditions 6,7 %

Aspect	Environmental Target	Activities	Deadline / Responsibility	Implementation
WATER	Improvement of waste water control to avoid potential violation of Phosphate limits	Retrofit online Phosphate monitoring system.	Q2 / 2011 Facility Department	Done, Phosphate monitoring installed in January 2011
	Risk precaution in waste water treatment plant.	Retrofit of a third sludge separator for sludge separation in the waste water stream.	Q3 / 2011 Facility Department	Done, new sludge separator installed and operating since September 2011

Environmental Program 2011 – Philippines- Review

Aspect	Environmental Target	Activities	Deadline / Responsibility	Implementation
AIR EMISSIONS	Reduce Transport related CO_2-emission by reducing distance travel from the supplier to plant	1. Prioritize usage local materials rather than procuring it abroad. 2. Outgoing shipment consolidation.	Q4/2011 Purchasing Department	Done. Localized suppliers and continuously implemented consolidation of deliveries and shipments.
	Reduce CO_2 emission	Tree planting activity	Q2/2011 Quality & Environmental Department	Postponed to 2012
ENERGY CONSUMPTION	Optimize energy utilization	1. Shutdown of idle tester during lean production month. 2. Replace of mechanically controlled thermostat for air-conditioning to digital thermostat. 3. Evaluate and define energy efficient lighting solutions for the new bldg. 4. Turning off lights during lunch time.	Q3/2011 Facility Department	Done.

Aspect	Environmental Target	Activities	Deadline / Responsibility	Implementation
ENVIRONMENTAL PROTECTION	Raised energy efficiency and minimize environmental emissions for the new factory	1. Evaluation of thermo solar cooling. 2. Integration of water recycling systems. 3. Integration of energy efficient building materials (windows, wall, roofing, etc.) 4. Implement green building technologies and practices following LEED standards where applicable in the detailed planning phase.	Q4/2011 ams Management	(1) Postponed for phase 2 of the project (requires budget) (2) Push back on project phase 2 if still applicable (requires budget) (3) Done and for implementation (4) Only those technologies that are applicable Q4/2012 ams Management
NATURAL RESSOURCES	Effective use of Natural resources	1. Paperless document retention 2. HP empty toner return program	On-going Quality & Environmental Department	(1) done, but with exemption (ex: BIR documents) (2) done for HP.

Environmental Program 2012 – Austria

Aspect	Environmental Target	Activities	Deadline / Responsibility
CO_2 EMISSION	Reduction of CO_2 Emissions	Get authority approval for biomass plant	Q4/2012 Facility Department
		Perform a pre-feasibility study in Philippines. Contact relevant persons in Philippines and define areas.	Q1/2012 Quality & Environmental Department
		Further analytical characterization of efficiency of abatement tools by an independent laboratory	Q2/2012 Facility Department
		Upgrade of EPI- abatement tools for further reduction of emissions	Q4/2012 Facility Department
ENERGY	Reduce energy consumption for illumination	Retrofit of LED-Lamps on parking lots to substitute mercury-vapour lamps by 25% of all outside lamps.	Q3 / 2012 Facility Department
WATER	Improvement of water control to detect leakages of PFCs into cooling water from chilling systems.	Retrofit online PFC monitoring in cooling water system	Q2 / 2012 Facility Department
WASTE	Improvement of waste separation in offices	Provide additional waste baskets for waste paper, plastics and residual waste	Q2 / 2012 Facility Department

Environmental Program 2012 – Philippines

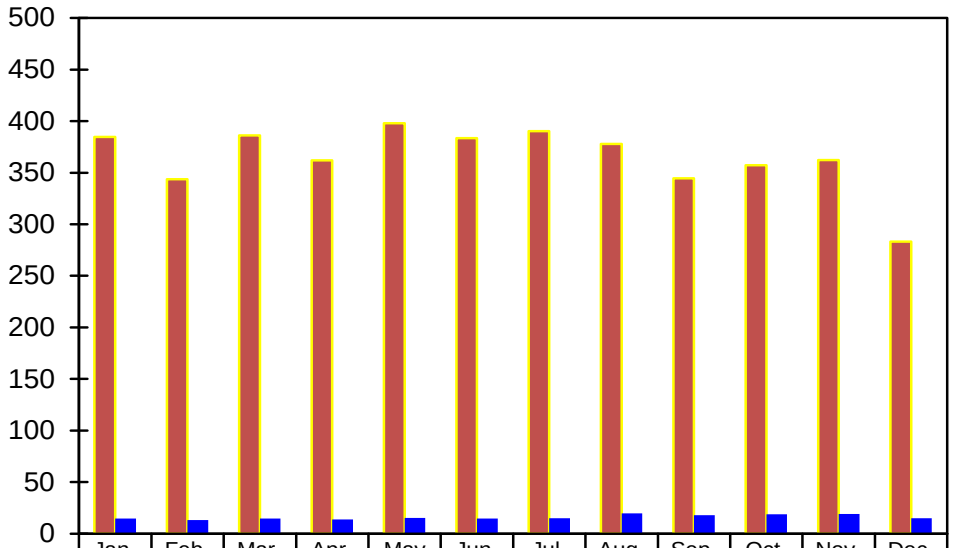
Aspect	Environmental Target	Activities	Deadline / Responsibility
AIR EMISSIONS	Carbon emission reduction by compensation activities	Evaluation of possible reforestation sites in Philippines	Q2/2012 Quality & Environmetal Department
		Tree planting at CIP 2 (ams Phil)	Q3/2012 Quality & Environmetal Department
ENERGY CONSUMPTION	Reduction of Energy Consumption activities	Shutdown of long idle tester during lean production month	Q4/2012 Facility Department
		Turn-off office lightings during lunch breaks	
		Set time program of operation of air-conditioning units.	
		Replace the mechanically controlled thermostat for air-conditioning to digital thermostat	
		Sequence in operation of all building equipment during start up and monitor peak load	
		Replacement of conventional ballast into electronic ballast. Replacement of 36W FL to 32W FL (to applicable areas)	
LAND CONTAMINATION	Assistance in proper disposal of E-Waste	Conduct Plant-wide acceptance of E-wastes generated by employees from their houses for proper disposal (recycling/recovery/re-use)	Q2/2012 Quality & Environmetal Department
	Proper waste segregation	Improve waste segregation practice (ex: canteen)	
	Proper Infectious waste disposal	Identify and qualify treaters for infectious wastes	
ENVIRONMENTAL PROTECTION	Raised energy efficiency and minimize environmental emissions for the new building	Execution of 2011 planned designs.	Q4/2012 ams Management
		Assess environmental compliance practices of project Narra	Q3/2012 Facility Department
NATURAL RESOURCES	Effective use of Natural resources	Elimination of ink-jet printer (heavy ink consumption)	Q4/2012 Facility Department

ams Philippines

The subsidiary in the Philippines was formed in 2005 to increase capacity in testing. In 2007, the test house in Calamba City, was certified according to ISO 14001:2004 by the independent certification body DNV.

Additional are some environmental related key facts from ams Philippines.

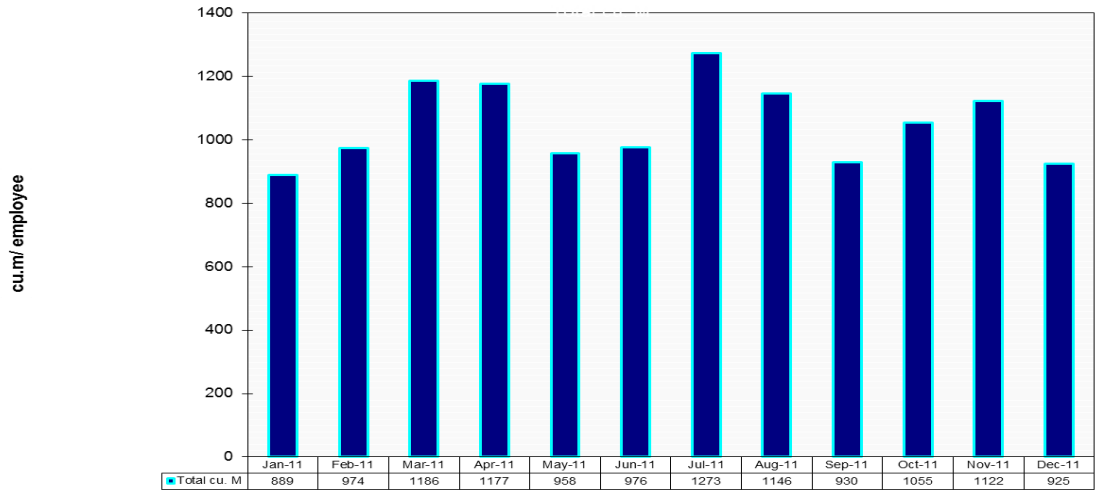
Electric Power Consumption
In order to have a continual improvement, ams develops an environmental program annually.



	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11
Actual kw - hr	384.8	343.7	386	362.1	398	383.5	390.2	377.9	344.4	357.3	362.3	283.2
KW-HRx1000 / Tester	14.79	13.21	14.84	13.92	15.31	14.75	15	19.89	18.12	18.8	19.06	14.91

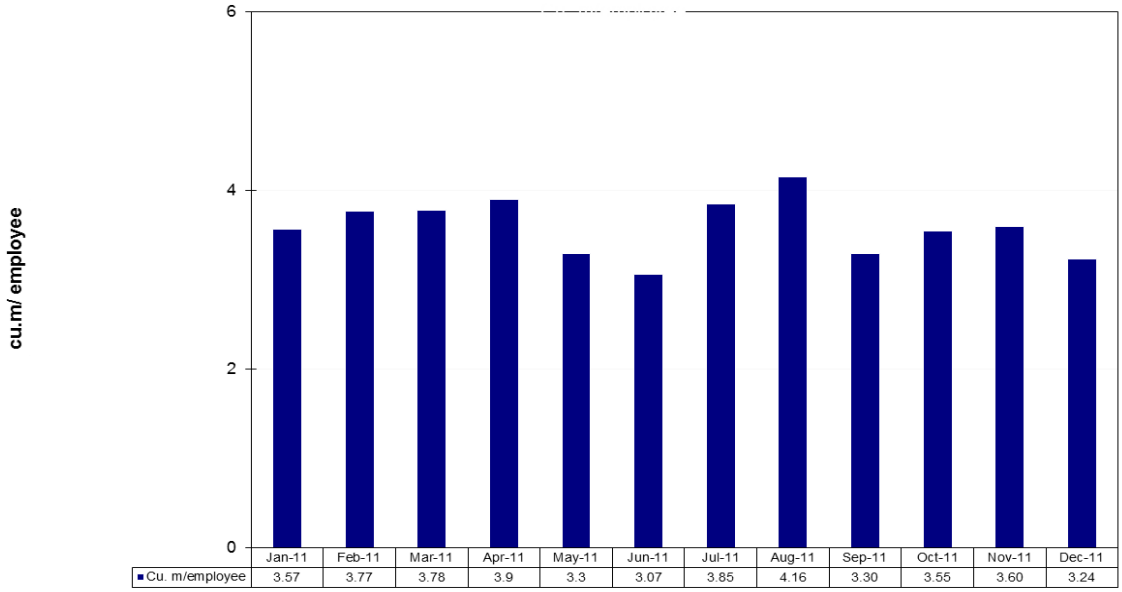
In 2011, the consumption of electrical energy of ams (Philippines), Inc. was 4.373 MWH. And compared to 2010 there is only less than 1% increase in power consumption and this is attributable to the increase in the efficiency of the equipment and operator and but due to the down turn in the production in last quarter of 2011, there was a slight decrease in efficiency and power consumption in the latter part of Q3 2011.

Total Water Consumption



The increased in Manpower and the wafer dicing activities contributed to the 10% increase in water consumption compared to 2010. The total consumption is 12,611 cu.m for 2011.

Water Consumption per Employee



In 2011 approximately 43 litres of water per employee were used at ams (Philippines), Inc.

You have found a detailed overview about our environmental activities in Unterpremstaetten, Austria and in our Test house in the Philippines. If you have further questions or if you need more detailed information, feel free to contact the Quality & Environment Department.

Yours truly!

Dipl. Ing. Herwig Klimesch
Director Quality & Environment

Gerit Götz, MSc
Manager Safety & Environment