Energy efficiency, renewable energy and climate change
How we address core issues

(*includes* GRI indicators EC2, EN5, EN6, EN7, EN18)

ABB has been in the energy business for nearly 130 years. Our products and solutions help customers along the entire energy value chain to extract, transform and use energy effectively and to increase industrial productivity in a sustainable way.

Mitigation of climate change is likely to be the most complex, long-term energy challenge that societies need to address and solve within the coming decades. With more than 80 percent of primary energy supplied by oil, coal and natural gas, and an increasing demand for energy, mostly in emerging economies, greenhouse gas emissions reach new record levels every year.

The link between energy efficiency, renewable energy and mitigating climate change is clear. According to the 2011 World Energy Outlook, published by the International Energy Agency, more than 70 percent of projected CO_2 emission reductions by 2020 can be delivered by energy efficiency. A combination of energy efficiency measures and renewable power generation could deliver almost 70 percent of the required emissions reduction over the next two decades.

Energy efficiency and renewable energy also contribute to resolve other major energy-related challenges such as energy poverty, resource depletion and security of supply.

ABB's Growth Strategy 2011–2015 identifies mitigation of climate change, renewable energy and energy efficiency as key drivers and growth opportunities for our business. Already, nearly 60 percent of our revenues are related to products and services in our energy efficiency portfolio that help customers save energy and reduce greenhouse gas emissions. ABB has created a dedicated Energy Efficiency industry sector initiative to bring the full potential of our portfolio to address opportunities to improve energy efficiency and mitigate greenhouse gas emissions.

During 2011, the initiative began working with ABB's businesses and geographies to launch comprehensive energy efficiency "solution sets" for sectors as diverse as printing and vehicle assembly. Each sector has unique energy challenges. However, many share inefficiencies in their operations or facilities which can be addressed through proven solutions.

In a similar way, ABB offers broad, cross-functional solution sets of products and services to the wind, water and solar industry sectors, as well as rail. Rail is becoming an increasingly important solution for sustainable mobility, helping to mitigate emissions as well as noise and congestion, as urbanization grows at historic rates.

In 2011, ABB won an order worth around $1 billion to supply a power link connecting offshore North Sea wind farms to the German mainland grid. This was the largest power transmission order in ABB's history. It will deploy the world's largest offshore HVDC (high-voltage direct current) system with a rating of over 900 megawatts (MW), keeping electrical losses to less than 1 percent per converter station. The completed link will be capable of supplying more than 1.5 million households with wind-generated electricity and help to avoid more than three million tons of carbon dioxide emissions per year by replacing fossil fuel-based generation.

ABB is a global leader in the development of smart grid technologies. These solutions will help create a lower-carbon power supply system by enabling more distributed generation, more power generated from renewable sources and a two-way grid that can receive as well as deliver reliable power.

In addition to our robust energy efficiency portfolio, ABB continues to make research and development investments as well as exploring early stage technologies and business processes through venture capital activity. Past activities have ranged from e-mobility to solutions for energy efficiency in data centers and smart grid communications.

Addressing climate risk

Potential climate change risk in ABB's operations is addressed in our comprehensive Enterprise Risk Management process. A wide array of risks is mapped at country, regional and divisional level and a consolidated risk mapping is made at Group level. Reviews of facilities are made annually or biennially. All facilities are required to develop, implement and test business continuity plans. The risk management process has not identified any significant climate change-related physical risk to ABB's operations. Issues considered include increased storm activity, heavy precipitation, floods or rising sea levels, availability and quality of water supply, and risk of disease/pandemic. Neither have we identified any regulatory risks related to our products, with the potential exception of further regulations related to the use of SF_6 in electrical equipment.

Working with partners to build capacity

In 2011, ABB published one of the most comprehensive overviews of energy efficiency in industry and utilities, Trends in Global Energy Efficiency. This publication is a contribution to raising awareness about the importance of using energy more efficiently and the opportunities that exist for industry and power utilities.

The first part of the report measures and analyzes the attitudes and ambitions of business around the world regarding energy efficiency. The second part provides a global overview of energy efficiency in industry and utilities, as well as in-depth reviews of the countries which collectively account for 75 percent of the world's energy consumption.

At country level, ABB works with a variety of partners, including policy makers, non-governmental organizations, academic institutions, industry peers and customers to raise awareness about technology solutions for improving energy efficiency, to share understanding about the risks and opportunities of different policy approaches, and to test technical solutions. For example, ABB in Italy organized an energy efficiency workshop where CEOs and top management of Italian public and private entities met international experts to examine the international energy situation and energy efficiency solutions in Italy. ABB also collaborates with learning institutions and industrial partners in Sweden, US, Denmark, Germany and Italy to investigate smart grid concepts, to build understanding of how today's grids can evolve to more interactive networks.

ABB participates in the World Economic Forum's steering committee for energy efficiency and contributes to its New Energy Architecture study. This report addresses the need for a rapid transition towards a new energy supply system with reduced carbon intensity, and how this should be managed to minimize economic, social and technological risks.

Concrete action to reduce our climate impact

ABB in Italy is pursuing a "green fleet" policy for company personal cars and service cars, targeting an emission reduction of 1,000 tons of CO_2 per year. The first step in the program is the introduction of a new range of company cars with average emissions of less than or equal to 150 gCO_2/km. This choice required a complete revision of the company car offer and the introduction of several new car models including, for the first time, hybrids. With this choice, ABB Italy estimates that in the years 2011–2012 the average emission per car within the offer will decrease from 148 gCO_2/km to 140 gCO_2/km, substantially closer to the objective that the EU imposed on car manufacturers, of 130 gCO_2/km by 2015. The program is supplemented by the introduction of eco-drive modules within the safe-driving courses program promoted by ABB in Italy and the distribution of tips for eco-driving to all employees.

ABB in Benelux received its CO_2 awareness certificate from Dutch railway infrastructure company ProRail in March 2011. The CO_2 awareness certificate scheme aims to encourage suppliers to become more active and aware of their own greenhouse gas emissions. To achieve the certificate, ABB in Benelux established its baseline carbon footprint, agreed CO_2 reduction objectives based on their seven sites in Benelux, undertook internal and external communications about the project, and agreed to participate in external CO_2 reduction collaboration initiatives.

The CO_2 emission reduction activities undertaken by ABB in Benelux during 2011 included energy efficiency programs at all sites, switching to 100 percent certified renewable energy, thereby saving 41 percent of their 2009 carbon footprint, and reducing emissions from car travel by switching to the use of e-cars for inter-office travel and boosting the use of videoconferencing.

Energy efficiency begins at home

At ABB, we aim to steadily increase the efficiency of our own operations, including through the use of our own products. We set ourselves the target of reducing the energy we use as a company by 2.5 percent per employee per year for 2010 and 2011. To implement the objective, our 23 most energy-intensive production sites were required to conduct energy audits and all sites were required to develop an energy saving program.

By the end of 2011 we had achieved our energy efficiency objective, reducing energy consumption per employee by 5.5 percent from 2009. Absolute direct energy consumption (oil and gas) was almost unchanged in 2011, compared with 2009, despite significant increases in production and employee numbers. Electricity consumption increased by approximately 10 percent, in absolute terms, from 2009 to 2011, whereas electricity consumption per employee remained stable. We expect to see further improvements in energy efficiency as energy savings programs gain further traction.

Emissions of SF_6 were unchanged year on year, despite a 10 percent increase in SF_6 handling at our facilities. We continue to pursue emission reduction programs at different sites, with actions ranging from improved handling and inventory procedures to leak detection and improvements in storage methods. However, challenges remain to ensure appropriate handling procedures at both ABB and customer sites.

We are working to improve our data collection around transport emissions, from our own fleet, from transport of our goods by external suppliers and from business air travel.

During 2011, we finalized the development of key performance indicators to monitor the environmental impact of transport of goods and completed pilot projects in Italy, Saudi Arabia and the US to help us understand how these indicators can be applied practically for both domestic and international transport. Draft guidelines for the application of these indicators have been developed and are still in a testing phase, with a proposed release date in 2012. Carbon dioxide emissions from cross-border transportation and air and sea transportation have been collected and are under evaluation. To guide and coordinate Group transport and logistics strategy and programs, we have formed a Transportation Council of regional and Group logistics managers.

For business air travel, we have established the means for data collection and the methodology for emissions calculation, based on the UK Department for Environment, Food and Rural Affairs and Department of Energy and Climate Change methodology. Data collection began in 2010, and the 2011 data are now included in our third party assurance process.

Energy and climate performance: Other GRI indicators

EN3 Direct energy use by ABB (Gigawatt-hours – GWh)

Primary fuel	2011+Baldor[a]	2011[b]	2010	2009
Oil (11.63 MWh/ton)	94	92	114	87
Coal (7.56 MWh/ton)	0	0	0	0
Gas	589	417	427	415
Total direct energy	**683**	**509**	**542**	**502**

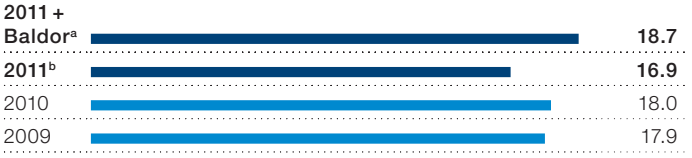
[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities

EN4 Indirect energy use: Consumption and losses at utilities (Gigawatt-hours – GWh)

Energy source	2011+Baldor[a]	2011[b]	2010	2009
District heat consumption	195	195	223	259[c]
District heat: Losses at utilities	29	29	33	39
Electricity consumption	1,621[e]	1,447[e]	1,335[d]	1,321[c]
Electricity: Losses at utilities	2,239	1,999	1,844	1,824
Total indirect energy	**4,084**	**3,670**	**3,436**	**3,442**

[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities
[c] The figure is based on reported data from 85 percent of employees and an assumed energy use of 3 megawatt-hours (MWh) per employee for district heat and 12 MWh per employee for electricity for the remaining 15 percent of employees.
[d] The figure is based on reported data from 87 percent of employees and an assumed energy use of 12 MWh per employee for electricity for the remaining 13 percent of employees.
[e] The figure is based on reported data from 85 percent of ABB employees and an assumed energy use of 12 MWh per employee for electricity for the remaining 15 percent of employees. All Baldor employees covered by the relevant reporting.

Megawatt-hours (MWh) per employee



[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities

Direct and indirect[a] energy use by type for 2011[b]

[a] Not including losses at utilities
[b] Data for ABB only, not including Baldor

EN16, EN17 Greenhouse gas emissions (kilotons CO_2 equivalents)
EN29 Significant environmental impacts of transportation (kilotons CO_2 equivalents)

	2011+Baldor[a]	2011[b]	2010	2009
Scope 1				
CO_2 from use of energy	144	109	117	107
SF_6	263	263	247	263
CO_2 from transport by own fleet	350[c]	350[c]	350[c]	350[c]
Scope 2				
District heat consumption	43	43	49	57
District heat: Losses at utilities	7	7	8	9
Electricity consumption	348	309	293	290
Electricity: Losses at utilities	480	427	405	400
Scope 3				
Air travel	N/A	185	160[d]	N/A

[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities
[c] Estimated figures
[d] 2010 data originally reported as 645 kilotons CO_2 equivalents. Assurance of 2010 and 2011 data uncovered a calculation error, which has now been corrected.

Environmental responsibility
Seeking continuous improvement

(includes GRI indicators EN2, EN9-15, EN21, EN24-27)

ABB has been working for many years to manage and reduce our environmental impacts, both within our own plants and offices, and those caused by our products and projects. We take a life cycle approach to assess the impacts throughout the phases of a product's life cycle – from manufacture and transportation to customer use and final recycling and disposal.

Life cycle assessment (LCA) is required as part of a product's research and development phase. Checklists provide guidance on how to reduce the use of hazardous substances, avoid other environmental and health risks, minimize consumption of resources, and design for recycling and easy end-of-life treatment. As part of our sustainability objectives, we have developed and launched supporting tools and training materials to ensure that these sustainability aspects are embedded in product development.

LCA is also used in the concept development phase for next generation products. In addition, we have developed associated LCA tools, such as the "LCA Light" tool that helps sales representatives to explicitly include environmental aspects in their discussions on the relative costs and benefits of different ABB solutions.

ABB has a long history of involvement in LCA. Our experts participated in the development of the ISO 14040 series of standards covering LCA and the ISO 14020 series on environmental labeling and we are still active participants in the Chalmers Life Cycle Center, a global competence center that continues to develop methodology and tools.

ABB develops Environmental Product Declarations to communicate the environmental performance of our core products over their complete life cycle. Declarations are based on LCA studies, created according to ISO/TR 14025. More than 80 declarations for major product lines are published on our website (www.abb.com).

To ensure continual improvement in our operations, we require all manufacturing and service facilities to implement environmental management systems according to the ISO 14001 standard. For non-manufacturing sites we have implemented an adapted environmental management system to ensure management of environmental aspects and continual improvement of performance. Almost all of these approximately 360 sites and offices currently work in compliance with the requirements of the standard and our environmental management program now covers operations in 59 countries.

Our management systems are underpinned by intranet-based tools and procedures. Our "Sustainability Toolbox" contains information to support the development of eco-efficient products and processes, and the implementation of ABB's sustainability objectives for 2010 and 2011

Hazardous substances

As part of our sustainability objectives, ABB is working to phase out the use of hazardous substances in our products and processes, where technically and economically feasible. We have developed lists of prohibited and restricted substances to guide this process and update them regularly, in line with developments in international regulations. ABB's suppliers are also required to apply this list to their own processes and supply chain.

Plant-specific phase-out programs are showing results, with some materials such as organic lead in polymers almost completely eliminated. This is mostly thanks to an improvement project at ABB's low-voltage products factory at Marostica in Italy, which has led to a significant reduction of organic lead used in extruded PVC products. The project involved the investigation of material requirements and selection and working with suppliers to obtain lead-free alternatives. The project continues, with a goal to obtain lead-free PVC production.

Alongside plant-specific schemes, global Business Unit (BU) focus programs continue. For example, the Volatile Organic Compounds (VOC) reduction program in the Transformers BU of our Power Products division is progressing well. The goal of the initiative is to reduce the solvent emissions from painting across the complete manufacturing spectrum of the business unit. The project aims to reduce the emissions from painting by 80 percent within BU Transformers, which would yield a reduction of 44 percent in the total emissions of ABB.

Conventional paints emit VOC and the main sources in ABB operations are the paint shops for transformers and motor manufacturing. In reduced VOC painting systems, the amount of solvent used as a carrier for the solid paint particles has been significantly reduced or replaced with another type of non VOC carrier, such as water. As well as reducing the environmental impacts of the release of VOCs to the atmosphere, this also makes the paint more pleasant to work with for our employees and reduces the health risks associated with VOC releases.

In cooperation with our suppliers, ABB Corporate Research Center has developed reduced VOC painting systems based on the ISO standard 12944-2. Paint solutions have been standardized globally and four suppliers have been approved for the program. Not only will this result in better environmental performance, but it also promotes standardization and secured quality across the global BU.

Over a two-year roll-out period, all ABB transformer manufacturing sites will convert to the lower VOC painting systems. This transition requires intensive work, site by site, including local system evaluation and testing, process mapping, quality assurance, transition planning and intensive training. Significant plants in Sweden, Finland, US, Poland and elsewhere have already converted to low VOC systems and work is ongoing in other countries. It is a complex process that sometimes must be shaped around commercial aspects, such as long-term frame contracts that require certain types of painting treatments and coordination of changeover in plants that supply to many customers.

When this internal initiative is completed, we intend to extend the program to our sub-suppliers who paint parts on our behalf.

Water

ABB's manufacturing processes do not use significant amounts of water, with extractions of groundwater and surface water used mainly for cooling purposes. None of these extractions caused significant changes to the water sources in 2011.

Approximately 50 percent of ABB's manufacturing sites use water for process purposes, and of these sites, about 60 percent use water for cooling. Water used for cooling is sourced mainly from local water sources and is returned to these sources without contamination. The use of closed-loop processes and reuse of waste water in other ways saved approximately 3,900 kilotons of water in 2011. In China, South Africa, Colombia and India, for example, water treated in ABB's own treatment plants is reused for local irrigation and in sanitary services.

About 81 percent of ABB locations discharge water to the public sewers, with 27 percent of these sites first processing that water through their own treatment plants. Excluding cooling water returned to the source of extraction, about 19 percent of locations discharge to local water sources, with about 50 percent of these sites first applying their own treatment. Two sites with their own treatment plants consider that their discharge of water affects the recipient. One site is currently addressing the capacity of its treatment plant to ensure that the water is of sufficient quality prior to discharge, while the discharge from the other site affects the receiving body as it is a near-permanently dry riverbed.

In order to better understand the impacts of ABB's water withdrawals, we have used the World Business Council for Sustainable Development Global Water Tool to characterize the renewable water resource availability in the countries and watersheds in which we operate. We have classified water resources according to the Food and Agriculture Organization methodology.[1]

When considering watersheds, 44 sites are located in extremely water-scarce watersheds (of these, 27 are manufacturing facilities), 48 in water-scarce watersheds (of these, 17 are manufacturing facilities) and 67 in water-stressed watersheds (of these, 33 are manufacturing facilities).

We have now developed an in-house tool for mapping and analysis of water flows at our facilities. Following pilot testing at a number of facilities in early 2012, the tool will be used in developing action plans at manufacturing facilities in water-stressed regions.

Thanks to a wide products and solutions portfolio, we provide our customers with enhanced performance, efficiency and reliability in water management. ABB's goal is to optimize the employment of water and energy resources to manage the integrated water cycle.

For example, ABB is providing a turnkey electrical control instrumentation and mechanical solution for the Réseau de Collecte water transfer scheme in Algeria, one of the largest water projects ever undertaken in the Sahara region. When completed, the water transfer scheme will pump and deliver 50,000 cubic meters of water a day via pipeline through the Sahara Desert from In Salah to Tamanrasset, a distance of almost 750 kilometers.

[1] *Food and Agriculture Organization of the United Nations (FAO) (2003). Review of world water resources by country. Water Reports 23. Rome.* According to this methodology, a watershed is considered water-stressed if the total actual renewable water resources (TARWR) are below 1,700 m^3 per person and year, water-scarce if below 1,000 and extremely water-scarce if below 500.

The ABB solution will power the whole water collection system and connect the In Salah site to the local power grid to ensure a safe and reliable supply of electricity to site operations. ABB instrumentation will measure the flow, temperature, pressure and quality of the water, and an ABB distributed control system will monitor and control the entire process. Earmarked as one of the Algerian government's key infrastructure projects, the capacity of the scheme is expected to triple to 150,000 cubic meters a day by 2030 to meet the needs of Tamanrasset's rapidly growing population.

Waste and recycling

ABB products contain mostly steel, copper, aluminum, oil and plastics. Approximately 90 percent of the material is reclaimable after the end of a product's useful life. ABB enhances the ability to recycle by designing products that can be dismantled more easily, and by providing users with recycling instructions.

The main waste streams at ABB organizations are metal, wood, paper, oil and plastic. We aim to reduce the amount of waste sent to landfill and to increase our use of materials which are recycled or made available for reuse.

ABB sent approximately nine kilotons of hazardous waste for disposal in 2011, unchanged from the previous year, despite increased business volumes and plant refurbishments and consolidation. This waste was mostly used for heat recovery at specialized plants. ABB follows legal regulations to transport and dispose of hazardous waste only through officially authorized disposal agents.

In 2011, 72 percent of total waste was sent for recycling. In-house recycling, mainly of thermoplastics and packaging material, reduced the amount of waste by approximately 3.2 kilotons. Additionally, the lead used as counterweights for robots and the cadmium used in industrial batteries are recycled materials.

As well as working to cut waste and improve material efficiency in our manufacturing processes, ABB also works to improve administrative processes and reduce costs. In many cases, this involves partnering with suppliers to develop win-win solutions. For example, in Australia, ABB is working with Fuji Xerox to exploit the potential of managed print services. This potential includes environmental and cost savings, as well as improvements in business workflows and efficiencies. By optimizing the employee to print device ratio, the Australian operation expects to make significant reductions in the number of printers running concurrently, potentially cutting annual CO_2 emissions by up to 66 tons through electricity savings. Additionally, paper-saving default settings on the new printers are expected to reduce annual paper consumption by 15 percent.

ABB provides an extensive range of maintenance, repair and refurbishment services to help customers minimize costs and lengthen the life cycle of their products. These services cover control systems, as well as diverse products such as drives, robots, analytical instruments and transformers.

For example, many of ABB's low-voltage and medium-voltage products have successfully served their application for over 10 or 20 years and may continue to do so for some years to come. In order to enable an extension to the product life cycle, ready-made and easy-to-apply upgrade and retrofit kits are designed for several product lines. These include conversion kits for legacy low-voltage breakers, upgrades for legacy low-voltage switchgear with modern intelligent technology for motor control, and upgrade kits for medium-voltage drive controllers, to allow better control, using the same equipment.

Biodiversity and conservation

ABB's manufacturing and workshop facilities are not located in, or adjacent to, protected areas or areas of high biodiversity value, as defined in internationally recognized listings or national legislation or internationally recognized listings such as the International Union for Conservation of Nature Protected Areas Categories 1–4, world heritage sites or biosphere reserves. Nonetheless, ABB works to rehabilitate our own sites and some of our operations are working with partners to contribute to local biodiversity. For example, ABB employees in Indonesia, Philippines and Qatar participate in activities to preserve local beach and marine environments, while ABB supports local forest preservation and tree planting schemes in the US, China, Italy and Dubai. ABB in Peru, Taiwan, and Malaysia contributes to wetland conservation, partnering with local parks to support the rehabilitation and maintenance of these valuable sites.

ABB in Switzerland focuses on its own premises and aims to landscape them in a natural way. Site maintenance using native trees and plants, and avoiding the use of fertilizer and biocides, helps to conserve biodiversity. Untouched flower fields, for example, are home to butterflies and many other insects. Sites in Deitingen and Dättwil are now certified as nature parks by "Natur und Wirtschaft," a foundation set up by the Swiss federal office for the environment and local trade associations with the goal to turn 10 percent of Swiss industrial real estate into green and natural areas.

Environmental performance: Other GRI indicators

EN1 Use of hazardous substances (tons)

	2011[a]	2010	2009
Phthalates – softener for PVC	47	31	16
PBB and PBDE – flame retardants in plastics	~0	~0	3.1
Lead in submarine cables	5,725	3,632	3,600
Organic lead in polymers	1.3	52	24
Lead in other products, eg, backup batteries and counter-weights in robots	227	265	313
Cadmium in industrial batteries delivered to customers	1.6	1.7	2.2
Cadmium in rechargeable batteries	10	5.9	4.7
Cadmium in lead alloy	4.3	2.7	2.5
Cadmium in other uses	0.02	0.18	0.05
Mercury in products delivered to customers	0.030	0.038	0.011
SF_6 insulation gas (inflow to ABB)	1,052	968	962
SF_6 insulation gas (outflow from ABB)	1,040	959	951

[a] ABB operations only, not including Baldor facilities

Water

EN8 Water consumption

EN10 Water recycled and reused

Water withdrawals (kilotons)

	2011+Baldor[a]	2011[b]	2010	2009
Purchased from water companies	3,400	3,400[c]	3,300[c]	3,300[c]
Groundwater extracted by ABB[d]	**N/A**	3,200	2,700	2,900
Surface water extracted by ABB[d]	**N/A**	2,600	2,900	2,700
Total water withdrawal	**9,200**	**9,200**	**8,900**	**8,900**
Water saved through recycling and reuse (kilotons)	N/A	3,900	3,000	800

[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities
[c] The figure is based on reported data from 87 percent of employees (85 percent in 2011) and an assumed water consumption of 10 tons/year/employee for the remaining 13 percent of employees (15 percent in 2011).
[d] Estimated (rounded) figures

Air emissions

EN19 Emissions of Volatile Organic Compounds (tons)

	2011[a]	2010	2009
Volatile Organic Compounds (VOC)	810	786	782
Chlorinated Volatile Organic Compounds (VOC-Cl)	13	11	5

[a] ABB operations only, not including Baldor facilities

The major constituents of VOCs and VOC-Cls are xylene, thinner and perchloroethylene. Increases in 2011 were due to increased business volume involving certain processes.

EN20 Emissions of NO_X and SO_X (tons SO_2 and NO_2)

	2011[a]	2010	2009
SO_X from burning coal	0	0	0
SO_X from burning oil	68	84	64
NO_X from burning coal	0	0	0
NO_X from burning oil	51	63	48
NO_X from burning gas	90	92	90

[a] ABB operations only, not including Baldor facilities

These figures are for fossil fuels consumed in ABB premises for heating and process purposes.

Waste and recycling

EN22 Waste generated (kilotons)

	2011+Baldor[a]	2011[b]	2010	2009
Scrap metal sent for recycling	161	97	135[c]	71
Other waste sent for recycling	42	39	44	46
General waste sent for disposal	47[e]	45[e]	38[d]	29[d]
Hazardous waste	11	9	9	6
Total waste	**262[e]**	**190[e]**	**227[c]**	**153**

[a] ABB and Baldor facilities included
[b] ABB operations only, not including Baldor facilities
[c] 51 kilotons are scrap metals from several locations in South Africa that have now been consolidated to one site.
[d] The figure is based on reported data from 87 percent of employees and an assumed waste output of 0.33 tons/year/employee for the remaining 13 percent of employees.
[e] The figure is based on reported data from 85 percent of employees and an assumed waste output of 0.33 tons/year/employee for the remaining 15 percent of employees. All Baldor employees covered by the relevant reporting.

Environmental incidents and penalties
EN23 Numbers of significant spills
EN28 Significant fines for non-compliance

Number of incidents

	2011	2010	2009
Oil spills	5	4	3
Chemical spills	0	0	0
Emissions to air	4	0	1
Others	0	3	0

Incidents were analyzed and adequate decontamination procedures were implemented to prevent any permanent contamination of soil and water due to these spills. Corrective actions, such as improved control systems, have been taken to reduce the risk of future spills. One incident related to an oil spill remains under consideration to determine the appropriate system improvements to prevent a recurrence.

During 2011, a $74,000 penalty was imposed on a US facility for a failure to report a complete Form R in a timely manner to the US EPA and the State of Virginia, a violation of Emergency Planning and Community Right-to-Know (EPCRA) Section 313. The issue occurred during 2009 and the case is now settled. An ABB plant in Italy was fined approximately $4,000 during 2011 for exceeding a water discharge parameter.

EN30 Environmental protection expenditure and investments

For 2011, ABB's expenditure on environmental management throughout its global sustainability affairs network was as follows:

Expenditure on environmental management	$ thousands
Group level	11,200
Country level	5,200
Site level	3,850
Total	**20,250**

ABB limits the accounting of sustainability to the costs of implementing and maintaining environmental management systems to ISO 14001, health and safety management systems to OHSAS 18001, and running the sustainability network, including personnel costs and the cost of developing sustainability tools, education and training.

This does not include costs related to improvement projects. For example, the decision to invest in a new manufacturing process is the result of integrating many decisions in addition to environmental considerations.