

# Right resources

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What we call “Right resources” covers both complying with regulations as a minimum, as well as our own improvement efforts to cut down on our use of natural resources, and reduce waste and the use of hazardous substances. Both are material to our success and are of significant interest to our stakeholders. Governments and customers are increasingly seeking information on how we source our resources as a condition for continued business; and the more we can reduce our use of natural resources like water and limit the use of hazardous substances in our manufacturing processes, the greater the benefit to our business, employees and society as a whole.

# Resource efficiency

## Reducing impacts

Our stakeholders have confirmed that ABB's operational efficiency – optimizing the use of resources and minimizing waste – is of significant interest to them. Addressing these issues also contributes to our business success by reducing costs and risks, improving the work environment for our employees and helping to maintain our license to operate.

**14%** cut in water use in water-scarce areas since 2011

### Reducing impacts where it's most needed

Although our manufacturing processes do not consume significant amounts of water, ABB is nonetheless committed to reducing our impact on local water resources. In order to better understand the potential impacts, we have employed the World Business Council for Sustainable Development's Global Water Tool to map our water use relative to the renewable water resource availability in the countries and watersheds where we operate.

We have taken this analysis one step further and developed an in-house water tool for mapping and analysis of water flows at our facilities. The tool was rolled out during 2012 in a program targeting our manufacturing facilities in water-scarce and extremely water-scarce watersheds<sup>1</sup>. These facilities, located in 15 countries across five continents, were required to systematically review water flows, analyze water-related opportunities and threats to their operations, and develop water action plans to minimize risks and to leverage opportunities.



The resulting action plans identified a wide range of opportunities to reduce impacts, including both behavioral and technical solutions. The most frequently described actions were the installation of aerators and low flow taps, identification of reuse opportunities for water from cooling systems and domestic uses, as well as awareness-raising and training programs. Many facilities have now installed flow meters to enable measurement of water use at key points and detection of leaks. This more detailed data helps to track performance improvement and to identify further improvement opportunities.

The program is already showing concrete results. Water use at facilities in water-scarce and extremely-scarce watersheds was reduced by 14 percent from 2011 to 2013. This delivers multiple “wins” – reducing water reduces both demand on a precious resource and the use of power to move water to and from our facilities – and it saves us money.

We have now also included Baldor and Thomas & Betts facilities in our mapping of ABB activities by watershed status. A total of 41 ABB sites are located in extremely water-scarce watersheds (of these, 6 are offices only) and 60 sites in water-scarce watersheds (of these, 13 are offices only). However, these sites account for less than 10 percent of ABB's global water withdrawals.

We will continue to monitor and support the implementation and periodic update of the water action plans and track performance via our environmental reporting process. As part of our activities to integrate acquired companies, we will work to introduce the ABB Water Tool and develop improvement plans at the relevant facilities.

### Water in our global operations

Looking at ABB's global operations in 2013, nearly half of our water withdrawals (47 percent) were used for cooling processes, about a third used for domestic purposes such as sanitation, cooking or garden maintenance (32 percent) and the remainder for manufacturing processes (21 percent). None of our extractions caused significant changes to water sources during 2013.

Of those sites that use water for process purposes, more than 30 percent use closed-loop systems. Excluding cooling water returned to the source of extraction, the use of closed-loop processes and the reuse of water in other ways saved approximately 5.9 million tons of water in 2013. Without this recycling and reuse, ABB's water withdrawals would have been more than 50 percent higher.

About half of our water discharge was to public sewers (48 percent), with almost 25 percent of that volume first processed at our own treatment plants. Another 45 percent was discharged to surface or ground water, with 75 percent of that volume pre-treated. The remainder was handled by hazardous waste water treatment companies.

### Waste and recycling

ABB products contain mostly steel, copper, aluminum, oil and plastics. The majority of this material is reclaimable at the end of the product's life and we enhance the ability to recycle by designing products that can be dismantled more easily and by providing users with recycling instructions.

<sup>1</sup> 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<sup>3</sup> per person and year, water-scarce if below 1,000 and extremely water-scarce if below 500.

Consequently, the main waste streams at ABB facilities are metal, oil and plastic, as well as wood and cardboard from packaging materials and paper from office activities. We aim to optimize material use, increase the share of waste that is reused or recycled and reduce the absolute amount of waste sent for final disposal.

Compared with 2012, there was no significant change in the total volume of waste generated at ABB's ongoing operations in 2013, despite increased business volumes and plant refurbishments and consolidation.

Considering all of our businesses, in 2013 ABB sent 81 percent of total waste for recycling, compared with 82 percent in 2012. However, the absolute volume of waste sent for final disposal increased, due to the first-time incorporation of newly acquired businesses in our 2013 results.

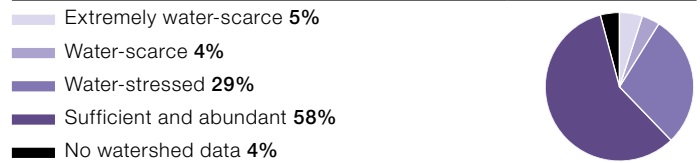
In-house recycling, mainly of packaging materials and thermoplastics, reduced the amount of waste by 3,900 tons. In total, we generated about 12,000 tons of hazardous waste in 2013, but sent almost 40 percent of that amount for recycling rather than disposal.

ABB operations undertake a wide range of waste reduction and recycling initiatives, bringing both environmental and cost benefits for the business. The nature of the improvement activities generally depends on the characteristics of the production processes and the local waste infrastructure. However, common themes emerge.

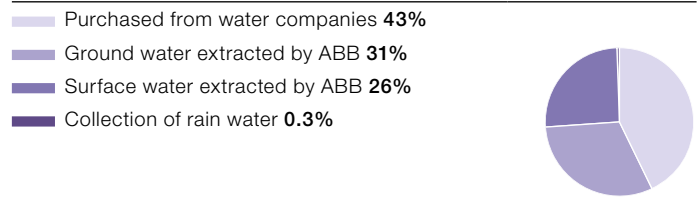
As a first step, many locations focus on awareness building and on ensuring processes are designed to support material efficiency and appropriate waste sorting for recycling. Process improvements can range from changing purchasing practices to encourage the supply of goods in bulk containers, thus reducing packaging waste, to improving inventory management of perishable goods, thus minimizing the disposal of expired materials. These good practices are also being implemented in many of our canteens where the focus is on reducing the supply of water in plastic bottles, better management of food waste and increased recycling.

During 2013, a number of our operations invested in novel processes to reduce or reuse waste. For example, a plant in the Czech Republic created a new type of compression mold to enable production of a component from recycled plastic. Our drives repair business in France implemented a new "biological fountain" to clean the electrical equipment. The new process uses micro-organisms rather than chemicals as cleaning agents, reducing hazardous waste generation by more than four tons in 2013.

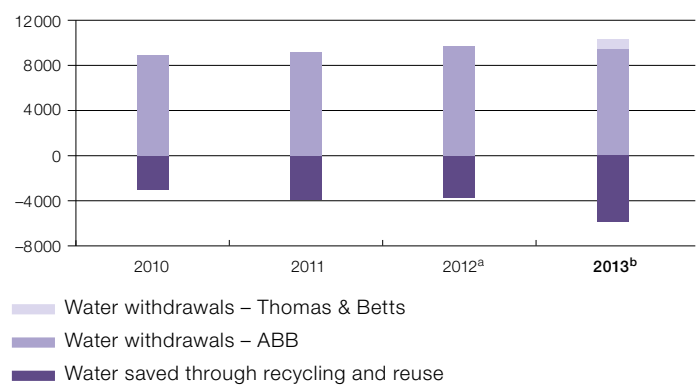
#### Water withdrawal 2013 per watershed status



#### Sources of water withdrawals in 2013



#### Water with drawals and water reused/recycled (kilotons)



<sup>a</sup> Baldor facilities are included; Thomas & Betts not included.  
<sup>b</sup> Baldor and Thomas & Betts facilities included.

#### Waste and recycling (kilotons)



<sup>a</sup> Baldor facilities are included; Thomas & Betts not included.  
<sup>b</sup> Baldor and Thomas & Betts facilities included. New category introduced – "Hazardous waste sorted and sent for recycling". Previously included in "Hazardous waste sent for disposal".

# Right materials

## Promoting responsibility along the value chain

ABB is committed to minimizing our environmental impacts and to ensuring the health, safety and protection of people who come into contact with our products and business. This requires attention to product design and manufacturing processes, as well to our supply chain, to ensure that the materials and components we use and the products we produce comply with our own and our stakeholders' standards.

### Improvement by design

When it comes to product and technology development in any part of the ABB Group, we use a process we call the ABB Gate Model. This decision model defines a series of gates, or decision points, to determine whether or not the project should continue. The intention is to ensure appropriate consideration of all aspects needed to satisfy the project's defined objectives. These include consideration of legal, technical, strategic, manufacturing, customer and other requirements.

Sustainability aspects are built into the Gate Model and include a standardized Life Cycle Assessment (LCA) procedure and a handbook to guide consideration of environmental, and health and safety aspects during design. These aspects include how to:

- reduce the use of hazardous substances,
- assure compliance with relevant laws and regulations,
- avoid environmental and health risks during product manufacturing and operation,
- minimize consumption of resources,
- design for recycling and easy end-of-life treatment.

We have developed support materials such as checklists and training packages for our research technologists to improve understanding and ensure sustainability aspects are incorporated into design.



In 2013, ABB's Corporate Research Center (CRC) in Sweden decided to take this a step further and established an award for "Green Project of the Year". The award was established to increase awareness at the CRC of the breadth of environmental aspects that technologists can influence through product and process design and elicited entries covering a wide range of technologies.

LCA is not only required as part of a product's research and development phase, it is also used in the concept development phase for next generation products. ABB develops Environmental Product Declarations to communicate the environmental performance of our core products over their life cycle. Declarations are based on LCA studies, created according to the international standard ISO/TR 14025. More than 80 declarations for major product lines are published on our [website](#).

11% reduction in Volatile Organic Compounds (VOC) emissions in 2013

### Reduction of hazardous substances

ABB continues to phase out hazardous substances in products and processes, where technically and economically feasible. We have compiled lists of prohibited and restricted substances to guide this process and update them regularly, in line with international regulations. These lists help our engineers, our suppliers and other partners like OEMs to comply with regulatory requirements, ensure a high level of protection for human health and the environment, and manage risks encountered by chemicals present in various products.

Our suppliers are requested to comply with these regulations, which are also part of ABB's Global Terms and Conditions and Supplier Code of Conduct. We have developed a [Guide for Suppliers to the ABB List of Prohibited and Restricted Substances](#) to support our suppliers to understand and implement the ABB List and to provide guidance on our suppliers' obligations.

ABB facilities are required to ensure compliance with the ABB List and to work to phase out hazardous substances in their processes and products. These programs are showing results, with significant reductions in the use of substances such as phthalates, used as a softener in PVC, and almost complete elimination of organic lead in polymers. Other activities are targeting, for example, elimination of solder containing lead and the substitution of various chemicals used in metal cleaning processes.

With the integration of our recent acquisitions, Baldor Electric Company and Thomas & Betts, we are seeing changes in the profiles of hazardous substances used on sites and in products due to different processes and product ranges. In particular, we have seen an increase in lead and cadmium in batteries delivered to customers and in polybrominated flame retardants used in polymers. We are working together to ensure implementation of the ABB List and to develop improvement programs.

Alongside plant-specific schemes, global Business Unit (BU) focus programs continue. The most extensive of these programs is an initiative to reduce Volatile Organic Compounds (VOCs) in the Transformers BU of our Power Products division. The goal of the initiative is to reduce the solvent emissions from painting across the complete manufacturing spectrum of the BU.



The program involves 62 factories in 27 countries and targets the reduction of VOC emissions by almost 300 tons, equivalent to the yearly VOC emission of 25,000 cars. Besides reducing emissions, this program has helped standardize paint operations and improve paint quality – benefits for our customers, our business and the environment.

### Promoting material compliance

Stricter legal frameworks have been put in place worldwide, which means ABB is required to monitor the source of certain minerals more closely, as well as to phase out the use of hazardous substances in our products and processes.

ABB is aware of and concerned by the conflicts occurring in the Democratic Republic of the Congo. We are actively working to identify which products and material from suppliers may contain conflict minerals and are engaging with our customers regarding their disclosure obligations.

Like many other companies tracing conflict minerals, it will take time for a company of our size and complexity to collect the information needed for us to fully understand our use of conflict minerals and therefore be able to address related customer concerns.

### Use of hazardous substances (tons)

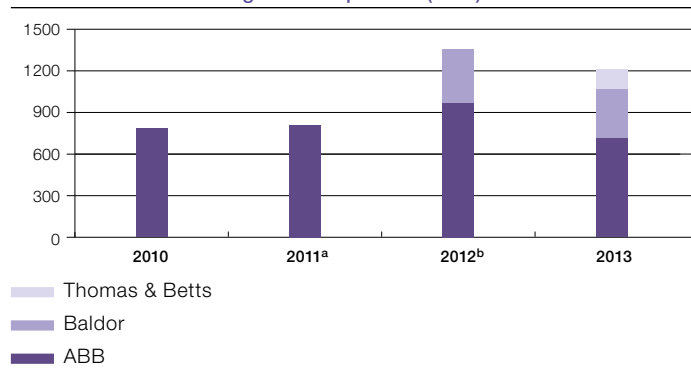
	2013 <sup>a</sup>	2012 <sup>b</sup>	2011 <sup>c</sup>
Phthalates – softener for PVC	21	28	47
PBB and PBDE – flame retardants	2.9	~0	~0
Lead in submarine cables	7,236	5,633	5,725
Organic lead in polymers	0.6	0.9	1.3
Lead in other products, e.g. backup batteries and counter-weights in robots	2,601	363	227
Cadmium in industrial batteries delivered to customers	4.4	5.6	1.6
Cadmium in rechargeable batteries	67.6	6.3	10
Cadmium in lead alloy and other uses	5.7	4.5	4.3
Mercury in products delivered to customers	0.012	0.011	0.030
SF <sub>6</sub> insulation gas (inflow to ABB)	1,438	1,139	1,052
SF <sub>6</sub> insulation gas (outflow from ABB)	1,425	1,118	1,040

<sup>a</sup> Baldor and Thomas & Betts facilities included

<sup>b</sup> Baldor facilities included; Thomas & Betts not included

<sup>c</sup> Baldor facilities not included

### Emissions of volatile organic compounds (tons)



<sup>a</sup> Baldor facilities not included

<sup>b</sup> Baldor facilities included; Thomas & Betts not included