



# Sustainability indicators 2011

## Progress report

Complementary  
document to the

**Solvay**  
Annual Report  
2011







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# “How we report?”

Solvay’s Strategic Sustainability Review is published every four years: “Towards Sustainable Development 2008-2012” presented in 2008 the overall strategy together with a consistent set of 107 sustainability objectives, among which 25 were highlighted as main objectives for their particular importance at the horizon 2012 and 2020.

Together with the Annual Report, “Sustainability indicators progress report”, yearly presents a wide and detailed range of 62 parameters (including 91 indicators) and reflects the overall sustainability management of the company in relation to these parameters, the deployment of the fixed objectives and the key recent achievements.

## **The extra-financial reporting of Solvay after the acquisition of Rhodia (2011)**

The extra-financial parameters reported in this document are organized according to the Global Reporting Initiative (GRI) guidelines reporting scheme. For the year 2011, 62 extra-financial parameters relating to sustainability performance of Solvay are reported. The corresponding 2011 figures and sustainability indicators of the Rhodia sector are presented along the same framework, in a parallel section, as it was impossible to already integrate the data about extra-financial performances. Following the acquisition of Rhodia by Solvay, the integration of the management processes related to sustainability, and of associated indicators, has been initiated.

Up to last year, Rhodia has also been publishing very extensive sustainability reports according to the French legislation on the New Economic Regulation (NRE). The full integration of extra-financial indicators and reporting is scheduled for year 2012.

## **The choice of the sustainability indicators**

The indicators presented in this report and followed by Solvay were selected to assess the deployment

and the performance regarding the objectives set and about overall sustainability management: social, health and safety practices, and environmental impact. Selecting the indicators included the following materiality criteria:

- Relevance to Solvay’s activities;
- Connection with stakeholders’ expectations;
- Link with the management and the objectives.

## **An external verification process for energy, greenhouse gas, and environmental emissions**

To ensure the reliability and credibility of its extra-financial reporting, Solvay commissioned Ernst & Young Company Auditors SCCRL (E&Y) to audit and ensure the reliability of key elements of its Sustainable development reporting system. In 2010, E&Y audited the energy and environment reporting procedures and rules. In 2011, the audit has been reinforced via a detailed analysis of how sites comply with every reporting rule (see: assurance report on pp. 122-123).

Similarly Rhodia commissioned PwC to audit the procedures and the indicators generated through their sustainability management system, the Rhodia Way (see: assurance report on pp. 124-125).

## **Commitment to United Nations Global Compact**



In 2010, Solvay committed itself to the United Nations Global Compact. This commitment implies to support the ten principles of the UN Global Compact as well as to report and communicate on a yearly basis with key stakeholders on progress made to implement the principles (as so called “Communication on Progress” or “COP”). Rhodia was also a signatory to the UN Global Compact.

The UN Global Compact defines several reporting levels: starting from “learner platform”, to “GC Active level” to “GC Advanced level”. The “GC Advanced level” is for companies that strive to be top performers and declare that they have adopted and report on a range of best practices in sustainability governance and management. To meet the “GC Active level”, companies need to submit a COP that covers all ten principles of the UN Global Compact and comply and communicate on 24 advanced criteria that are set by the UN Global Compact. Within the spirit of the UN Global Compact, it is not necessary that all 24 criteria are met, but that companies are willing to be transparent and are aiming for progress.

Solvay was able to meet from the first year the criteria of the “Advanced reporting level” and consequently became a “Global Compliance Advanced” Company.

Rhodia’s adhesion to UN Global Compact goes back to 2003 and fully undertakes the 10 universal principles concerning human rights, working conditions, respect for the environment and anti-corruption.

See: Making the UN Global Compact - GRI connection p. 136.

**Sustainability reporting at Corporate level declined at three levels**

Data and information related to the extra-financial practices and performances of the Solvay group are thus reported via three complementary documents:

- the periodic strategic review “Towards Sustainable Development”;
- the annual report, in the Business chapters and in the dedicated chapter on Sustainable development;
- the yearly complementary document “Sustainability indicators progress report”.

Solvay relies on three complementary channels to report on sustainability performance.



This triangular reporting demonstrates how the Group’s mid & long-term visions translate into the day-to-day activities and programs, how the Group complies with regulations and with own commitments, what are the progress made and the difficulties encountered.

The objective is to fuel a true and informed dialogue on the sustainability challenges with the Group’s key stakeholders: investors, customers and suppliers, employees and contractors, the local communities and the global society: authorities, consumers, media and the academic word... Such a permanent dialogue is essential to feed the Group’s strategy by helping identify the materiality of sustainability challenges.

**Solvay awarded among Best Belgian Sustainability Reports**

In 2011, Solvay was selected as one of the two finalists for the Award for Best Belgian Sustainability Report. This price rewards companies reporting in a transparent way, their social and environmental data separately from the financial data.

It is organized by the Institut des Réviseurs d’Entreprises, KAURI, the Belgian multi-actor learning network and knowledge centre on Corporate Responsibility, together with Business & Society Belgium. The Solvay report was acknowledged by the jury, which highlighted the matrix of sustainability materiality of the Group, the clarity of its reporting’s policy, the key performance indicators presented over several years, the objectives set for 2012 & 2020, and the external verification by third parties.



# Introduction

Sustainability is an integral part of the Solvay group's strategy, as a source of long-term value. Health, safety, and environmental concerns have been at the heart of Solvay's management for very many years. In practice, the strategy is structured around three main axes: the development of a **sustainable chemistry portfolio** of activities, a commitment to **responsible management** and progress covering the full lifecycle of products, and establishing a **dialogue** with all stakeholders.

Rhodia had also placed sustainability at the heart of its strategy. The merger of the two companies strategies will strengthen two previously parallel approaches, making the new Group a key player in the chemical industry.

Health, safety, and environmental concerns have been at the heart of Solvay's management for very many years, as is illustrated by the "Environment" reports that were published from the early 1990s, which then became "Sustainable development" reports in the 2000s. Solvay's environmental programs led to a substantial decrease in the Company's impacts on air quality, water, and soil over the past two decades. Emissions have been reported and consolidated since the 1990s in the SERF reporting system, validated by Arthur D. Little (1997).

Global sustainability governance has been strengthened in 2008 by the appointment of a Sustainable development Manager who reports directly to the Chairman of the Executive Committee. He ensures the implementation of the processes necessary to achieve the objectives and consolidate results. A Sustainability Council bringing together external experts is currently being set up and will directly advise the Executive Committee.

In addition, the evaluation program for the sustainability of Solvay's whole portfolio in itself constitutes a strategic lever for the Executive Committee in making decisions that relate to the future of products and markets (see 1.1.1. Sustainable Portfolio Management on p. 20). All major R&D projects are also systematically examined within the framework of this program, according to 16 strict sustainability criteria integrated in the Sustainable Portfolio Management methodology.

*“ Since the 2008 strategic review, Solvay's global sustainability approach has been formally established and the piloting and measurement of decisions and action program have been strengthened and systematized. ”*



Michel Bande  
Senior Executive Vice President  
Sustainable Development at Solvay

## Orientating our products and markets portfolio

One of the three main Group's sustainability axes is to look for a portfolio of sustainable activities that optimises resource use and that puts forward applications for markets which are in line with sustainability megatrends. This progress point is twofold: the development of the portfolio of activities must favour production facilities that are geared towards a better use of natural resources, and, as far as the markets for its products are concerned, towards functions which provide users and clients with solutions to improve the sustainability of their own products and activities.

Currently, about 30% of the turnover of the Solvay group (including the Rhodia sector) is generated by products and markets which are aligned with and supported by key sustainability requirements.

## Managing responsibly

Managing our activities responsibly relies on a management culture founded on the Group's industrial vision, on the efficient and responsible management of the Group's industrial tools and resources, but also on extensive experience of long-standing relationships with local communities, employees, and customers.

Our pioneering commitment to sustainability was marked by the Group's Responsible Care® commitment back in 1992. This resulted for example in stopping the production of chlorofluorocarbons as early as 1994, making it the first initiative of its kind in Europe, and replacing them with alternative products, hydrochlorofluorocarbons and then hydrofluorocarbons, which not only had no impact on the ozone layer, but also had a lower impact on the climate. We also worked on a wide-ranging program of new units for the co-generation of electricity and heat, which contributed in particular to the VEEP program (Voluntary Energy Efficiency Program) of the Cefic.

This increased focus on environmental issues, looking holistically at the full lifecycle of our products, the pressures on ecosystems and on non-renewable resources, new emerging social and societal issues, has led to the identification of critical aspects of our economic, social and environmental management. These aspects are the focus points of our continuous improvement programs, as we develop methods and measures implemented on over 107 objectives for 2012 – with some for 2020.

## Engaging with our stakeholders

### Engaging in dialogue within a wide-ranging strategic framework

The third pillar of Solvay's commitment is built around a genuine dialogue with our stakeholders. Our approach to stakeholder engagement is embodied by the 5x5 matrix, which defines the strategic framework for dialogue with investors, customers, suppliers, employees, local communities, and finally society as a whole.

### Creating a shared vision with a solid foundation

Dialogue and commitment must be based on in-depth knowledge of extra-financial performance, shared with our stakeholders. This is the raison d'être of our 80 key indicators, of standardised evaluations such as "Solvay Sustainability Screening (S<sup>3</sup>)", "Umberto tool" for environmental ecoprofiles, or the employee polls "Solvay People Surveys".

For investors and ethical rating agencies, a certification audit of our environmental performance reporting is implemented by the audit and consultancy firm Ernst & Young (E&Y).

## A true convergence between Solvay & Rhodia

The implementation of Solvay's sustainability strategy is embedded in its operational strategy. Deploying the strategy is the responsibility of the operational line, within the Business entities themselves.

This set-up has been strengthened by many initiatives amongst which, the signing of a Sustainable development Charter by the Management and the European Works Council (EWC), the organization of employee forums to increase awareness and thrive engagement, the development of management tools (e.g. Sustainable Portfolio Management tool), the appointment of dedicated sustainability champions at the Executive Committee level (for climate, energy, health, security, environment, innovation...) supervising the implementation of programs.

### Consolidating our processes through the integration of Rhodia

For Rhodia, responsibility equally means managing the Company's environmental, social and economic impacts. Rhodia's historical culture of safety is one of the building blocks for exercising this responsibility. Rhodia set up and deployed the Rhodia Way back in 2004 and has been building on this ever since.

As a stakeholder-led program, Rhodia Way systematically addresses the Company's 21 commitments to implement good practice in their 44 strategic areas that are most material in terms of sustainability.

For each of those strategic areas, operational units undertake to progress in order to implement a structured and progressive approach to sustainability in their operations. A cornerstone of this approach is the full commitment of employees, obtained through dialogue with the trade unions, demonstrated in particular by a global agreement on Social and Environmental Responsibility with the International Federation of Trade Unions for this sector (ICEM). This approach, which was updated in 2011, complies with ISO standard 26000 on Social and Environmental Responsibility.



**RESPONSIBLE CARE®**  
OUR COMMITMENT TO SUSTAINABILITY

## Responsible Care® Commitments

Responsible Care® commits participating companies to continuous progress, beyond the regulatory standards and requirements to which it is subjected and with which it complies.

Solvay and Rhodia have also signed up to the UN Global Compact (UNGC) initiative and are working towards the UNGC's objectives. They are dedicated to keeping our promise of constantly working towards sustainability performance for our Group and beyond.

“ *The Rhodia Way guides us professionally and we put forward our ambitions for social responsibility. The challenge now is to do even better together in the new Solvay. It's both a demanding and exciting prospect, but I'm sure we will meet this challenge.* ”



Jacques Kheliff  
Sustainable Development  
Vice President at Rhodia

## Products enabling sustainability solutions

As a world leader in chemistry, Solvay is increasing its presence in products that serve and enable better sustainability with innovation and R&D playing more and more a significant role in this move.

While the Chemicals sector strategy aims at accentuating the growth of its specialty products, particularly in **environmental, energy, electronics and hygiene and healthcare markets**, many products of the Plastics sector are already aligned with the global sustainability megatrends in **health care, energy, mobility and communication**. These elements contribute to make specialty products of both sectors a business area of structural and sustainable growth, in particular in emerging markets.

In 2011, the acquisition of Rhodia materialized this strategy, as exemplified by key recent achievements by both Solvay and Rhodia: the additional EUR 10 million investment by Solvay in Plextronic's development of innovative technology in **organic light-emitting diodes and photovoltaic cells**. Or initiatives by Rhodia and their Rare Earth Systems businesses for the recycling of rare earth from **magnets, energy-saving lamps and rechargeable nickel metal hydrid batteries**.

Other examples include the development by Solvay with Air Liquide of on-site fluorine gas production units that greatly reduce the use of greenhouse gases in the **photovoltaic and semiconductor industries** or the commissioning

of the world's largest hydrogen peroxide plant in Thailand that will enable to produce **propylene oxide with unique and sizeable economic and environmental benefits** in terms of water emissions and energy consumption. In the meantime, Rhodia inaugurated in Shanghai (China) the **Ecoefficient Products and Processes Laboratory**, a joint international unit dedicated to green chemistry developed in partnership

between the French Centre National de Recherche Scientifique, Ecole Normale Supérieure de Lyon and East China Normal University. **Solutions for electric cars** are also an integral part of the Group's portfolio of sustainable products strategy. Other examples of major growth drivers include the Rhodia's **silica line of products that are used in low-energy tires, automotive catalysis and low-energy lighting**.

### Working together with our employees

Through a dedicated working group of the European Works Council (EWC), a permanent dialogue dedicated to sustainability issues has been established since many years with Solvay's employees representatives. The Group's global strategy is discussed, a common charter for Sustainable development and corporate responsibility has been signed, and inter-hierarchical forums on Sustainable development have been organized on Company sites to promote the Group's strategy and encourage proposals which might enrich this strategy.

#### **ICEM: A global commitment by Rhodia to social and environmental responsibility.**

On February 1, 2005, Rhodia executed a global agreement with the largest international union federation, the International Federation of Chemical Energy Mine and General Workers

Union (ICEM). The first of its kind in the chemicals sector, this agreement organizes a permanent framework for dialogue on compliance with the international social standards.

Each year, an assessment is carried out on a Rhodia site chosen by ICEM to monitor the correct application at a grassroots level of the commitments made by Rhodia. These assessments have already been completed in China, Brazil, the US and South Korea, and an annual review has been presented to an extra-national body representing the Group's employees (EWC).

The agreement was renewed in 2008 and again in February 2011 for a period of five years. It has been reinforced on each occasion. As a result, Rhodia and ICEM, have set up a new joint "Global Safety Panel" in order to widen the scope of management/employee dialogue to include the Group's safety policy worldwide.

# Solvay 2011, going further to achieve excellence



## Operational excellence

The defined 107 objectives are aimed at bringing operational entities to excellence in management areas that have been identified as critical, that are directly related to Sustainable development issues, and for which improvements of practice and performance are targeted.

The attention given to the full lifecycle of products has resulted in the stronger focus precisely given to programs aimed to better understand and manage the products beyond the production steps.

These actions include programs to better select and audit transporters, the contribution to the lifecycle assessment of products, or the efforts devoted to better document how products are and should be used by customers, particularly in the context of European Regulation REACH and CLP. 13 of the 107 objectives are dedicated to improving the lifecycle of products.

The 107 objectives (among which 25 are classified as “major”) set all along the strategic report “Towards Sustainable Development 2008-2012” are regularly evaluated regarding the progress made in their achievement.

		STAKEHOLDERS				
		INVESTORS	SOCIETY	CUSTOMERS & SUPPLIERS	PERSONNEL & SUBCONTRACTORS	LOCAL COMMUNITIES
AXIS	<b>CITIZENSHIP</b> Act as a ethical and corporate citizen	<b>Position</b> ourselves as a reference and ethical industrial investment	<b>Practice</b> citizenship beyond our business activities and contribute to scientific knowledge	<b>Ensure</b> business ethics	<b>Build</b> a common ethical commitment based on shared values	<b>Raise</b> community dialogue and participation to local life (neighbours, authorities, associations,...)
	<b>MANAGEMENT EFFICIENCY</b> Apply efficient management processes	<b>Achieve</b> excellence in managing human, financial and material resources	<b>Reduce</b> global ecological footprint of our production and supply chain activities	<b>Aim</b> long-term competitiveness and ensure product stewardship	<b>Guarantee</b> fair labour conditions, safe working conditions, empowerment and career management	<b>Optimize</b> environmental performances
	<b>OUR PRODUCTS TODAY</b> Supply sustainable, profitable and growing products and services	<b>Prioritize</b> creation of long-term and sustainable value through market leadership	<b>Bring</b> products and services preserving environment & health, enhancing global well-being and serving essential needs	<b>Propose</b> quality, efficient, reliable documented and validated products and services	<b>Expand</b> multidisciplinarity, diversity, network / partnership practices and competencies in sustainable development	<b>Contribute</b> to local wealth : employment, salaries, purchase of local goods and services
	<b>TOMORROW'S OPPORTUNITIES</b> Lead a world industrial strategy	<b>Implement</b> a long-term growth strategy triggered by innovation and sustainable development	<b>Design</b> new products and solutions preserving environment & health, enhancing global well-being, serving essential needs while participating to the evolution of legal framework	<b>Co-develop</b> new sustainable products, services and solutions and their related markets	<b>Favour</b> creativity and innovation	<b>Strengthen</b> local economical development: clusters of economic activities, infrastructures and equipments, competencies
	<b>CRITICAL RISKS</b> Manage raising critical issues	<b>Mitigate</b> risks and related financial impacts	<b>Contribute</b> to education, training and employment of young people	<b>Take part</b> to the active management of products end-of-life and anticipate substitution of products	<b>Minimize</b> critical risks and related human impacts: accidents, occupational diseases, layoffs, loss of expertise	<b>Protect</b> neighbors and their living environment: health, environment, employment, major risks prevention

“The Matrix 5x5 guides and formalizes the Sustainable development strategy for the Solvay group and all its entities. By cross-looking at the intersection of the expectations of the stakeholders of the Group and the five driving axes of its strategy, key fields are identified which, when combined, will be the sphere of operation for the action we take in relation to business, the environment and our role in society.

*Towards Sustainable Development 2008-2012, p. 9*

A synthetic evaluation shows that about 85% of the objectives are in the categories “achieved - in line with target - good progress” with 7.5 % reaching yet an insufficient achievement and another 7.5 % having been stopped or modified to fit better with the materiality of the various situations or challenges.

Regarding those classified as “major objectives”, 19 out of 25 (or 76 %) are in the categories

“achieved - in line with target - good progress”

Among the most advanced ones those that can be highlighted are the use of the sustainability tools (SMP and Ecoprofiles), the reduction of global GHG emissions and of the Global Air and Water Emissions Indices as well as the program regarding the Safety Training of contractors.

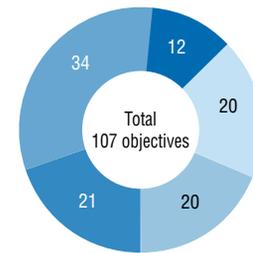
Those still showing a progress considered as reaching insufficient achievement are the risk based inspections on sites, the CO<sub>2</sub> emissions linked to the transport of our products or the encouragement of employee’s participation to local life.

DEPLOYMENT OF THE SUSTAINABILITY OBJECTIVES SET FOR THE 2006-2012/2020 PERIOD

Distribution by governance clusters

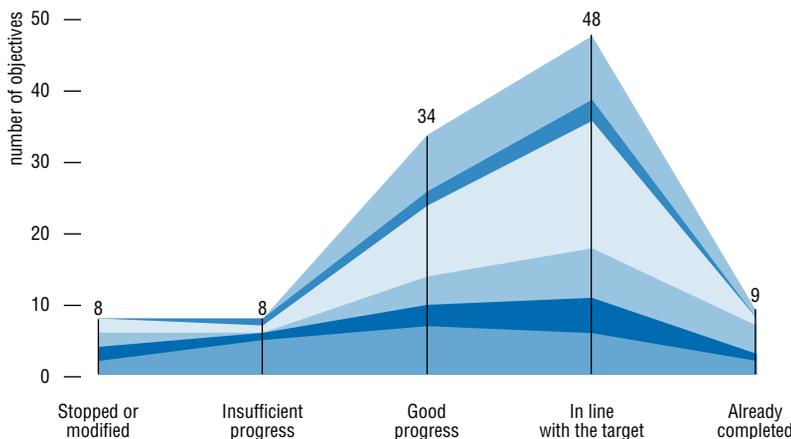
	Stopped or modified	Insufficient progress	Good progress	In line with the target	Already completed	Total
● Governance & compliance	0	0	8	9	1	18
● Raw materials & Supply chain	0	1	2	3	0	6
● Manufacturing HSE	2	1	10	18	1	32
● Products & their stewardship	2	0	4	7	4	17
● R&D Innovation	2	1	3	5	1	12
● Human Resources	2	5	7	6	2	22
<b>Total</b>	<b>8</b>	<b>8</b>	<b>34</b>	<b>48</b>	<b>9</b>	<b>107</b>

Distribution by stakeholders



- Investors
- Society
- Customers & Suppliers
- Local communities
- Personnel & Contractors

Number of sustainability objectives by stakeholders.



## Rhodia assessment 2011, progress of the Sustainable development approach

**Rhodia Way**” Rhodia is on the way to sustainability excellence thanks to Rhodia Way, a structured program addressing its 21 commitments and implementing good practice in 44 areas that are material to sustainability and Corporate Social Responsibility. For the fifth consecutive year since 2007, Rhodia business units have evaluated their practices in accordance with the Rhodia Way® framework.

**From industrial sites and business units to research centres and corporate functional departments such as procurement, finance, legal and public affairs, all of the Group's entities evaluated their practices in 2011 in relation to sustainability.**

The objective of this approach was for each of the organizational entities to define themselves against the Rhodia Way® objectives, and then create a progress plan. The results of this fifth assessment confirm the progress made, and indicate that the Group's entities are moving in the right direction.

For the six areas encompassed by Rhodia Way (customers, employees, environment, investors, suppliers and communities), Rhodia's responsibility profile was overall balanced and continuously improving. An impressive 94% of Rhodia's employees were involved in the assessment. Each GBU tracks its responsibility profile based on this evaluation and defines a progress plan.

### An integrated management method

The Rhodia Way is integrated into the managerial processes described in the in-house management book. Using a grid

analysis and a scoring system, it helps managers assess the maturity of their unit's Corporate Social Responsibility (CSR) performance and draw up improvement plans. Since the reference framework was launched, five self-assessments involving all Group units have been carried out.

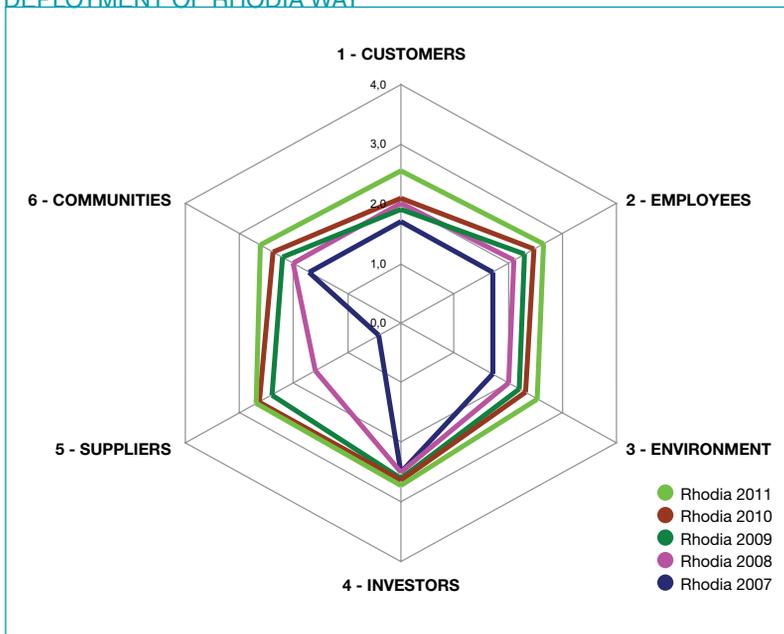
### A strictly controlled process

To endorse the validity of this approach, Rhodia called upon the

expertise of external organizations. Reports about the Rhodia Way are therefore submitted to employee representative organizations, audited by external organizations (PwC in 2009 and Vigeo in 2010) and integrated into the procedures checked by the international trade union ICEM. Rhodia is currently the only chemical company to commit to its corporate social responsibility practices with a trade union organization within an international agreement.



### DEPLOYMENT OF RHODIA WAY



## Sustainability at the heart of Rhodia's culture

Rhodia's culture is strong of a long history of health and safety concerns and social dialogue which has enabled the Company to forge ahead in the field of sustainability. The Rhodia Way corporate social responsibility approach is integral to management processes as a cornerstone of Rhodia's identity, and is a driver for continuous improvement.

The results obtained in social and environmental performance have led to Rhodia's ranking among the best companies worldwide in terms of occupational safety, and it is listed in the 2012 Sustainability Yearbook presented at the World Economic Forum in Davos. This edition, put together by SAM, the leading global extra-financial rating agency, only lists the top-scoring 15% in each of the 58 sectors assessed for the Dow Jones Sustainability Index. Rhodia was also recognised by Vigeo, the first European extra-financial agency, as one of the best chemical companies for its CSR performance. Rhodia is also listed in the leading European indexes, Aspi Eurozone and the Ethibel Index.

Rhodia has also been very active in developing its portfolio of products by investing in new sectors, and also applying strict sustainability criteria to the evaluation of its R&D projects, as well as reorienting its portfolio.

Since 2008 and until the end of Rhodia quotation at Paris Stock Market (September 2011), Rhodia was of the nine best CSR performers, for the chemical sector listed in the Dow Jones Sustainability Index.

## Responsibility rooted in the company's management

Thanks to Rhodia's HSE management system (RCMS), performance in the sphere of health, safety, and environment currently places Rhodia among the leading chemical companies in the world.

Since the end of the 1990s, Rhodia has also taken a pioneering role in sustainability by investing in the fight against greenhouse gas emissions. In 2002, Rhodia intensified its approach and set up a dedicated sustainability department, represented on the Executive Committee. A new threshold was reached in 2007 with the global deployment of the Rhodia Way reference framework, defining the Group's responsibility commitments towards its six key stakeholder groups.

## Rhodia Way, a 360° commitment

The Rhodia Way aims to improve relationships and dialogue with stakeholders. Deployed in all of Rhodia's sites, the framework gives each unit the tools to assess and improve its practices, mobilise all employees and get their stakeholders involved.

Created by Rhodia's employees, the Rhodia Way framework of commitments is both ambitious in its objectives and anchored in the reality of the business. It incorporates existing indicators and operating processes wherever possible, making it easier for the teams to embrace them.

A strong sign of Rhodia's commitment at the highest level is that in 2011, 10% of the bonuses awarded to the Rhodia's 3 000 top executives were tied to the achievement of social and environmental objectives defined by their units.

<b>CUSTOMERS</b>	<ul style="list-style-type: none"> <li>▶ Express our CSR commitments in our relationships with customers</li> <li>▶ Integrate CSR in our innovations</li> <li>▶ Manage the risks relating to our products</li> </ul>
<b>EMPLOYEES</b>	<ul style="list-style-type: none"> <li>▶ Guarantee the health and safety of employees</li> <li>▶ Develop employability</li> <li>▶ Ensure a high-quality, well-balanced social dialogue</li> <li>▶ Foster diversity in the workplace</li> </ul>
<b>ENVIRONMENT</b>	<ul style="list-style-type: none"> <li>▶ Promote environmental management</li> <li>▶ Preserve natural resources</li> <li>▶ Limit our impact on the environment, preserve biodiversity</li> </ul>
<b>INVESTORS</b>	<ul style="list-style-type: none"> <li>▶ Promote environmental management</li> <li>▶ Preserve natural resources</li> <li>▶ Limit our impact on the environment, preserve biodiversity</li> </ul>
<b>SUPPLIERS</b>	<ul style="list-style-type: none"> <li>▶ Define CSR pre-requisites and integrate them in the supplier selection process</li> <li>▶ Assess buyers' performance in terms of CSR</li> <li>▶ Manage and assess suppliers, optimize relations</li> </ul>
<b>COMMUNITIES</b>	<ul style="list-style-type: none"> <li>▶ Control risks related to the presence of entities on their territories</li> <li>▶ Ensure that entities are well integrated in their territories (region, country)</li> <li>▶ Control risks in the logistics chain</li> </ul>

## Performance recognized in extra-financial ratings

The acknowledgement of our performance is also illustrated by the integration of Solvay into the FTSE4Good Index or Rhodia listing in Ethibel Excellence Index and the positive, albeit perfectible, ratings the Group has received from major extra-financial rating agencies (Dow Jones Sustainability Index, Vigeo, Eiris, Carbon Disclosure Project).

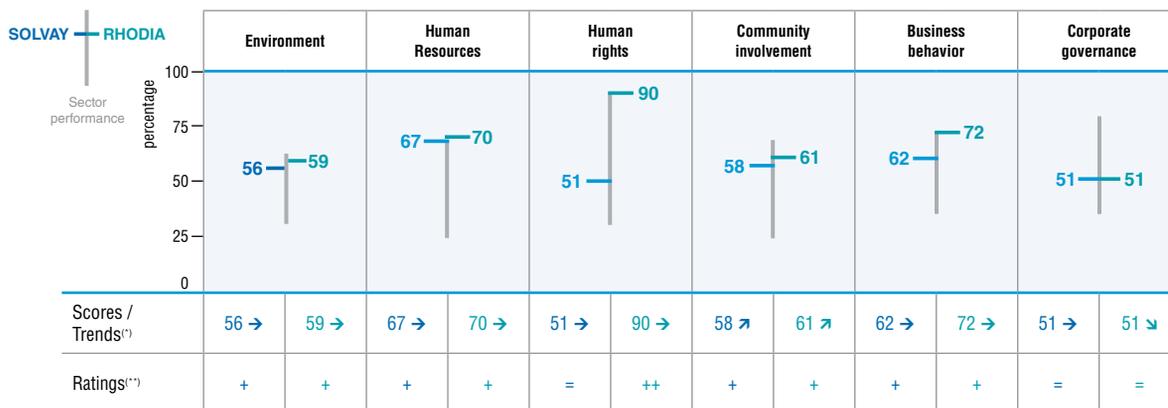
### Dow Jones Sustainability Index 2011 Chemicals corporate sustainability assessment results



	Solvay score			Rhodia score			Chemical sector		
	2009	2010	2011	2009	2010	2011	Average score	Best score DJSI	Lowest score DJSI world <sup>(*)</sup>
							2011		
Economic dimension	61 / 100	68 / 100	76 / 100	79 / 100	77 / 100	84 / 100	61 / 100	93 / 100	79 / 100
Environmental dimension	75 / 100	73 / 100	73 / 100	98 / 100	93 / 100	88 / 100	58 / 100	93 / 100	75 / 100
Social dimension	48 / 100	52 / 100	56 / 100	75 / 100	69 / 100	68 / 100	54 / 100	88 / 100	73 / 100
<b>Total score</b>	<b>61 / 100</b>	<b>64 / 100</b>	<b>68 / 100</b>	<b>84 / 100</b>	<b>80 / 100</b>	<b>79 / 100</b>	<b>57 / 100</b>	<b>90 / 100</b>	<b>78 / 100</b>

<sup>(\*)</sup> Lowest score obtained by the companies included into the DJSI Index.

### Overall CSR performance & trends attributed by Vigeo Rating - Last available rating 2010



<sup>(\*)</sup> 2010 scores and trends since previous year's assessment.

<sup>(\*\*)</sup> Change in the ranking of Solvay as compared to Sector performance since previous year.

rating: min -- / max ++



FTSE4Good

**FTSE4Good Index Series scores & ratings - Solvay 2011**

	Risk	Score	Rating
<b>Environment pillar</b>	<b>2.5</b>	<b>4.0</b>	<b>10 / 10</b>
Environmental management	3.0	4.0	-
Climate change	2.0	4.0	-
<b>Social pillar</b>	<b>2.0</b>	<b>2.0</b>	<b>3 / 10</b>
Human & labor rights	2.0	2.0	-
Supply chain			
<b>Government pillar</b>	<b>2.5</b>	<b>4.0</b>	<b>10 / 10</b>
Countering bribery	3.0	4.0	-
Corporate governance	2.0	4.0	-
<b>Overall</b>	<b>-</b>	<b>3.4</b>	<b>89 / 100</b>

**Why interact with extra-financial rating agencies?**

The purpose of the dialogue with extra-financial rating agencies and institutional investors is to get their feedback on the extra-financial performance of the Company so as to clarify where further progress can be made in the sustainability strategy.

The second objective is to reinforce on this basis the reputation of Solvay in these matters.

**Solvay responds more specifically to four extra-financial rating agencies**

Solvay responds specifically to four extra-financial rating agencies selected to represent together a broad coverage of the various societal expectations: Vigeo, Dow Jones Sustainability Index (DJSI) and the Carbon Disclosure Project, and Eiris for the FTSE4Good Index. Rhodia used to answer all CSR questionnaires from rating agencies or institutional investors. In 2011, Rhodia was listed in the global leading extra-financial Index DJSI, ASPI and Ethibel, the first

major European indexes, and was evaluated by the Carbon Disclosure Project.

**Dow Jones Sustainability Index**

In 2011 again, a progress (+ 4 %) has been noted in the global score of Solvay, yet the level enabling integration into the Index has not yet been reached.

Significant areas for improvement are clearly identified regarding better consolidation and reporting of some parameters in particular for social performance, innovation processes and performances and supply chain management.

Rhodia has been recognized by SAM in its 2012 Sustainability Yearbook<sup>(1)</sup> as one of the top 15% companies in the global chemical sector. Since 2008 and until the end of Rhodia quotation at Paris Stock market (Sept. 2011), Rhodia was one of the nine best CSR performers, for the chemical sector, listed in the Dow Jones Sustainability Index world. This position highlights good performance, especially in the environmental dimension, also excellent governance practices,

or comprehensive risk and crisis management framework. Areas of improvement cover the social dimension such as human capital management or corporate citizenship philanthropy.

<sup>(1)</sup> Rhodia is referenced in the 2012 Sustainability Yearbook presented at the World Economic Forum in Davos, Switzerland. This edition realized by SAM, lists only the top scoring 15% in each of the 58 sectors assessed for the Dow Jones Sustainability Index (DJSI).

**Vigeo**

In 2011, Solvay also obtained a good global rating from Vigeo, upgraded for community involvement as well as on account of enhanced reporting on the domain, including in terms of means dedicated to the promotion of social and economic development. Vigeo highlighted in particular the existence of quantified targets towards health and safety, the fact that line managers are evaluated on their Human Resources performance. Vigeo also highlighted the existence of a dedicated team of compliance officers at Solvay, that executive remuneration is put to shareholders' vote and the promotion of the employment of local personnel.

The lower rating of Solvay for Human rights is due to the lack of visibility of implementation and monitoring procedures in place with respect to freedom of association and the right for collective bargaining.

Rhodia was recognized by Vigeo as one of the best chemical companies for its CSR performance. In the Human Rights area, Rhodia's Global Framework Agreement on CSR signed with the ICEM<sup>(\*)</sup>, which includes provisions on trade unions' rights and on discrimination prevention, is considered as a best practice and gives the company a leading position in the chemical sector. Vigeo highlights also the positive trends observed in environmental performance indicators, such as major decreases, normalized to sales, of waste production, most atmospheric and water emissions, energy and water intake as well as CO<sub>2</sub> emissions.

(\*) ICEM: International Federation of Chemical, Energy, Mine and General Workers' Unions (see p. 9)

### Eiris - FTSE4Good Index

Solvay continues to be a member Company of the FTSE4Good Index, the responsible investment index calculated by the global index provider FTSE Group based on the Eiris rating.

Since March 2011, our environmental management score improved, bringing the overall rating for the environment pillar from eight to the maximal score of ten, reaching the score for the government pillar. **The overall Solvay rating improved from 83 to 89.**

### Carbon Disclosure Project

For its second participation to the reporting initiative, Solvay has again a performance score (CLPI) of "B" which shows the real integration of climate change as a priority for the Group strategy although not all the initiatives are fully established. Rhodia performance score is "C": initiatives into strategy.

The level of disclosure (CDLI) is high for Solvay as well as for Rhodia with a score of 76 and 74.

### A barometer of the deployment of the sustainability strategy in the Group

From the regular dialogue with the extra-financial rating agencies or the sustainability experts among investors, we identified the eight key structural criteria required for the deployment of a consistent sustainability approach. These eight criteria are incorporated into a "barometer" which consists in the synthesis of the ratings regarding processes and procedures and this barometer of processes completes the evaluation of our performances regarding each of these criteria.

The eight criteria are: (1) the existence of a formal policy, (2) the designation of a high level of its application, (3) an explicit strategy for implementing the Policy, (4) the definition of targets, (5) the existence of indicators (KPIs), (6) deployment procedures, (7) monitoring and verification / audit (internal / external) performance (8), a reporting appropriate.

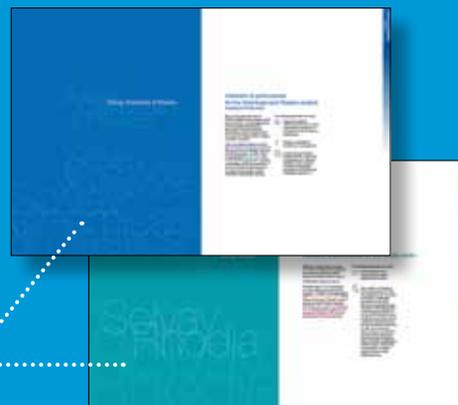
From this barometer and the analysis from ratings for each cluster, a list of targeted actions considered as priorities regarding processes is established and is discussed with the relevant entities. The designated sponsor's for each "cluster" of deployment (HR, energy, HSE, governance, innovation...) have to mobilize the necessary human and material resources necessary to carry out these actions plans.

## Solvay & Rhodia extra-financial performance for 2011 presented in 2 distinct sections

The present document “Sustainability indicators progress report 2011”, focuses on indicators, progress, and deployment of the management elements that support the extra-financial performance of the Company.

These elements, following the take-over of Rhodia, have not been integrated for the year 2011 into an unique, consistent reporting for the three “sectors” of the Company and are presented along the Global Reporting Initiative (GRI) structure. A GRI index is given on pp. 126-135.

They are addressed in two distinct sections:  
one for Solvay (**Chemicals and Plastics sectors**), .....  
and one for Rhodia (**Rhodia sector** (see on p. 84)), .....  
The performances reported clearly demonstrate a strong convergence. Workstreams are under way to build a unified, consistent sustainability strategy and reporting for 2012.



Solvay  
Chemicals  
& Plastics

Solvay Chemicals & Plastics

Solvay  
Chemicals  
& Plastics

Solvay  
Chemicals  
& Plastics

## Indicators & performance for the Solvay Chemicals & Plastics sectors

(not covering the Rhodia sector)

Due to the recent take-over of Rhodia, indicators and progress up to the end of 2011, and the deployment of the management elements that support the extra-financial performance of the Company have not yet been integrated into a unique, consistent reporting.

Thus, they are addressed in two distinct sections: one for Solvay (Chemicals and Plastics sectors), and one for Rhodia (Rhodia sector (see on p. 84)). The performances reported clearly demonstrate a strong convergence. Workstreams are under way to build a unified, consistent sustainability strategy and reporting for 2012.

The following pictograms are used:



Solvay has defined additional objectives to reach sustainability excellence in management and to improve performance.



Solvay is committed to excellence in management.



Ernst & Young Company Auditors SCCRL (E&Y) was commissioned to audit the reliability of key elements of Solvay's Sustainable development reporting. See assurance report on pp. 122-123.



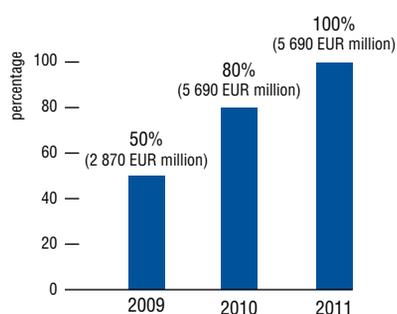
# 1. Profile of the organization

## 1.1. Strategy & analysis

A number of tools and processes are in place to fully align Solvay's activities with its sustainability challenges and opportunities. During the 2008 strategic review dedicated to Sustainable development, 107 projects and objectives were identified, all of them aimed at moving towards the overall strategic objective of managing, by 2020, a balanced portfolio of activities in terms of sustainability. A range of tools are used to assess the present and future activities: the Sustainable Portfolio Management tool (SPM), the S<sup>3</sup> tool (Solvay Sustainability Screening), Ecoprofiles, etc.

### 1.1.1. Sustainable Portfolio Management

Assessment with Sustainable Portfolio Management (SPM) tool



To evaluate all products and R&D projects according to the SPM methodology.

**The overall current business portfolio was assessed using the tool Sustainable Portfolio Management (SPM), a proprietary tool developed with Arthur D. Little and the Dutch organization for Technological Research TNO.**

This assessment is currently undergoing an external peer review.

In addition, the environmental profiles "cradle to gate" (Ecoprofiles) of virtually all products have been established. These environmental profiles are used to compare different products or processes and also help customers to build the lifecycle assessments (LCA) of their products.

The SPM assessments support strategic decisions by the Executive Committee by assessing the sustainability of a product along two axes: its production and its markets.

The production axis includes the key environmental impacts related to the manufacturing of this product, a.o. energy consumption and associated greenhouse gas emissions. On the market axis, the tool enables the evaluation of the alignment of a given application of this product with the trends of this market in terms of sustainability.

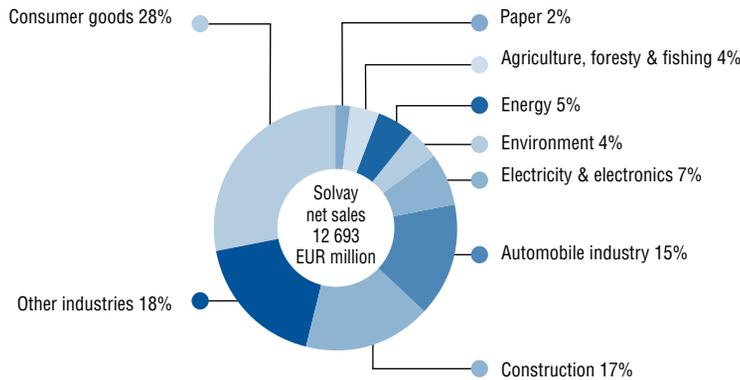
The assessments have been reviewed by Arthur D. Little.

*Perimeter: for 2011, progress of the SPM assessment program is based on 2010 revenues and covers only the Chemicals and Plastics sectors, excluding the portfolio of Rhodia because of its recent date of integration in the Group perimeter.*

*In 2012 it is planned to conduct an assessment according to SPM along the product applications for the Rhodia activities. The objective is to cover the equivalent of at least 80% of sales of each product line.*

**1.1.2. End markets (GRI 2.2)**

Group net sales including Rhodia, 2011



Perimeter: equivalent to financial perimeter.  
 The pro forma figures show the income statement (1) as if the acquisition of Rhodia had become effective from the 1<sup>st</sup> of January 2010, (2) harmonizing the accounting rules and (3) eliminating the Purchase Price Allocation (PPA) impacts.  
 The figures are reviewed by Deloitte within the global financial audit.  
 More details on the economic performance of the Solvay group are to be found in the Annual Report.  
[www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)

- To strengthen the Group's presence in fast-growing markets.**
- To develop its activities with a high added value.**
- To growth in products with reduced environmental and energy footprint.**
- To reduce the cyclicality of the business portfolio.**

**With the integration of Rhodia, Solvay becomes a major world player in chemistry providing added-value products and high-performance solutions in key markets including consumer**

**goods, the chemical industry at large, construction, automotive, energy, water & environment, and electronics.**

These products contribute to improve the quality of life, the performance of Solvay's customers and address key issues such as health, hygiene, housing, and mobility.

The Group is a world leader in 90% of the markets it serves, achieves 40% of its sales in high-growth countries and is investing 220 EUR million a year in R&D:

- For soda ash, hydrogen peroxide, sodium bicarbonate, high

performance engineering polymers, high performance silica, rare earth formulations, diphenols, specialty surfactants and polymers, etc.;

- For fluorinated chemicals, polyamide 6.6 & polyamide 6.6-based engineering plastics;
- For vinyls, fluorinated polymers and cellulose acetate tow.



### 1.1.3. Sustainable portfolio - Aligned & stars

Portfolio in sustainable chemistry - Products in markets

	Turnover achieved in solutions towards
Reduced energy use	13%
Improved supply chain for freshwater	4%
Reduced exposure to harmful & toxic substances	3%
Improved supply chain of waste management	5%
Increased production of food & feed	3%
<b>Total aligned &amp; stars</b>	<b>28%</b>

*Perimeter: equivalent to financial perimeter (excluding Rhodia).*

*The Sustainable Portfolio Management (SPM) assessments support strategic decisions by the Executive Committee by allowing to evaluate the sustainability of a product along two axes: its production and its markets.*

*On the market axis, the tool allows to evaluate the alignment of a given application of this product with the trends of this market in terms of sustainability. The production axis includes the key environmental impact factors related to the manufacturing of this product, a.o. energy consumption and associated greenhouse gas emissions or toxicological profile.*

 **To reach, by 2020, 20% of product sales in the “star” category, i.e. in markets fitting one or more of the 16 sustainability criteria of SPM and demonstrating strong growth.**

The portfolio, assessed before Rhodia’s acquisitions, reaches 21.5% of “aligned” product-in-applications and 6.5% of “star” product-in-applications (see 1.1.1. Sustainable Portfolio Management, on p. 20). This makes 28% of products-in-applications clearly supported by trends for sustainability, because they already fuel solutions searched by customers and consumers in order to be more sustainable.

Acquiring Rhodia’s portfolio is a key step in becoming a global industrial reference in sustainable chemistry and enlarging the portfolio of products and of markets supported by good sustainability perspectives.

Today, and including the Rhodia portfolio, around 30% of sales of the Solvay group stem from activities (products in markets) clearly in line with emerging sustainability requirements. An assessment of the Rhodia portfolio using the SPM methodology is planned.

## 1.2. Governance, commitments & engagement

The Group's Code of Conduct, together with its Mission, Vision, and Values, is a key lever of its strategy and shared by all employees.

Global governance in Sustainable development has been strengthened and placed under the authority of a Member of the Executive Committee.

Since 2011, Rhodia includes in the remuneration policy criteria related to Sustainable development.

Regarding public affairs, Solvay has rigorous practices and related tasks are not assigned to outside agencies. The dialogue on sustainability challenges is reinforced with the external stakeholders, including extra-financial rating agencies and investors.



### 1.2.1. Compliance with the Code of Conduct (GRI 4.8)

Number of non-compliances reported

	2009	2010	2011
Cases reported	21	23	16
Cases investigated	3	9	9



#### To apply the Code of Conduct systematically.

**The Code of Conduct is based on respect for the law and basic rules of humanity, loyalty, fairness, and accountability. It draws on international commitments such as the Universal Declaration of Human Rights, the Convention on the Rights of the Child, and various International Labor Organization (ILO) Conventions.**

The Code of Conduct states that violations will be subject to sanctions in relation to the seriousness of breaches, with the potential damage to the Group, its employees or any third party and in relation to the degree of involvement and collaboration of those concerned. Solvay is a member of Transparency International and reports to the Global Compact.

The Solvay group has adopted a general policy on reporting irregularities and misconducts. Through the "Speak Up" campaign, Solvay encourages its employees to report their concerns or their ethical dilemmas to their managers or to dedicated internal organizations.

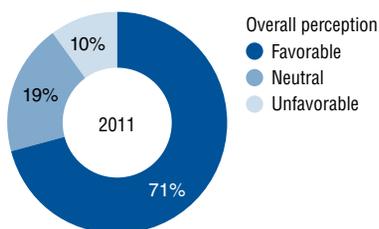
Trainings to familiarize employees to use "Speak Up" are organized throughout the Group. Solvay has also installed an external reporting "hot line", hosted by a third party for reporting concerns and seeking advice. This line is operated in the majority of the countries in which Solvay is active but not yet in all countries, due to regulatory constraints.

Training courses and induction activities are organized to ensure that an ethical and compliant conduct is embodied in the way business is done by Solvay and also to address behavioral risks in certain specific areas, such as corruption and competition law. As part of this campaign, all managers have received a specific training on how to handle employees concerns in this area.



### 1.2.2. Ethics & shared values

Perception - Solvay People Surveys



	Favorable			Neutral			Unfavorable		
	2006	2009	2011	2006	2009	2011	2006	2009	2011
“My Company behaves with honesty and integrity in its external dealings (e.g. with suppliers, customers... )”	80%	81%	78%	15%	14%	16%	5%	5%	6%
“I am aware of what the Solvay group’s Values are”	80%	87%	85%	14%	10%	11%	6%	4%	4%
“I believe the Solvay group’s Values are lived”	56%	62%	55%	31%	26%	29%	13%	12%	16%
“In my Company, the Code of Conduct of the Solvay group is taken seriously”	-	73%	65%	-	18%	23%	-	9%	12%
<b>Overall perception</b>	<b>72%</b>	<b>76%</b>	<b>71%</b>	<b>20%</b>	<b>16%</b>	<b>19%</b>	<b>8%</b>	<b>8%</b>	<b>10%</b>

Perimeter: whole Solvay group.

Internal surveys are performed every 2 years to evaluate how employees consider various aspects of the Group’s management. People’s perception is analyzed through four main statements: honesty and integrity, awareness of values, implementation of Values, implementation of Code of Conduct. About 85% of the personnel (86% in 2009, 78% in 2006) responded to the latest survey.

**To ensure that relationships between employees are founded on trust, mutual respect, complying with the five Solvay’s Values: ethical behavior, empowerment, respect for people, customer care, and teamwork.**

**The 2011 Solvay People Survey shows that a large majority (85%) of the personnel is well aware of the Solvay group’s Values. While 55% consider these Values are indeed lived, 16% have an unfavorable opinion.**

The focus on Solvay group’s Values remains a key driver of engagement. There is a slight decrease in the overall favorable perception, with more neutral opinions in 2011. The shift in the perception of how the values are lived could be a consequence of the Pharmaceuticals sector’s sale and of the implementation of the Horizon project<sup>(1)</sup> (see Annual Report on page 24).

<sup>(1)</sup> The aim of the Horizon project (in place since April 2011) is to reorganize the Group, as part of the strategy to make the Group a major player in sustainable chemistry.

**1.2.3. Dialogue with investors on sustainability (GRI 4.16)**

	2008	2009	2010	2011
Meetings with investors focused on sustainability	12	8	18	12

*Perimeter: whole Solvay group.  
 One-on-one investor meetings dedicated to Solvay's sustainability targets and performance are important and involve investor's experts with a specific expertise in these areas.*

**The sustainability dimension of performance is increasingly important to institutional investors. Ratings by financial agencies now encompass a larger number of sustainability indicators. Solvay is developing a targeted communication and dialogue on its sustainability policy and parameters and multiplies the opportunities of dialogue with investors involved in Corporate Social Responsibility (CSR) values.**

The improved rating by EIRIS, an extra-financial rating agency, has notably allowed Solvay to enlarge its presence in investment funds such as those of FTSE4Good which require strict sustainability criteria. Solvay's disclosure in these matters is more and more appreciated and called "best in class" by many. The investors' interest goes mainly towards governance, CO<sub>2</sub> emissions, improvement of production process

footprint (e.g. Epicero<sup>®</sup> or HPPO), energy and waste management or product toxicological profiles. The organization of Solvay sustainability management at Board level is also gaining importance. More information on extra-financial ratings, see general introduction on pp. 14-16.



### 1.2.4. Advocacy

Advocacy staff

	2007	2008	2009	2010	2011
Corporate	2	3	3	2.5	5
Region	10	11	11	13	11

*Perimeter: whole Solvay group.  
Number of persons (full time equivalents) in public affairs.*

**To establish direct and continuing discussions amounting to long-term collaboration with governmental authorities and other representatives of civil society, based on clarity, trust, and mutual benefit.**  
**To identify the right competencies within the Group, to ensure high-quality dialogue with governmental authorities and stakeholders.**

**About 16 Solvay employees are directly involved in the management of these matters:** 5 at corporate level and a network corresponding to 11 “full time equivalent” people at national/regional level in Europe, the US, Asia, and Mercosur. Their goal is to directly or indirectly establish on a basis of trust and clarity a permanent dialogue and a long term partnership with public authorities and other relevant stakeholders on issues of common

concern. These actions are performed in line with all existing local laws and in respect of the Solvay group policy on Government and Public Affairs. The success of Solvay’s efforts to engage sustainability with stakeholders has been validated by a survey conducted by a third party asking Solvay’s stakeholders to rate the transparency and professionalism of the Group in its contacts with them.

Issues	Stances
Fight against climate change	Significant contributions to the definition of the carbon exposure status of relevant activities and strongly involved in the definition of benchmarks of the third EU Emission Trading Scheme (ETS). Contribution to various pieces of legislation developing a climate-friendly framework for business.
Responsible chemical handling	Contribution to the International Council of Chemical Associations’ (ICCA) Chemical policy and Health work and implementation of the ICCA’s global product strategy internally. Founding member of the Global FluoroCouncil bringing together the world’s leading Fluoro-technology producers to promote global initiatives and industry-wide responsible actions. Contribution to the creation of an EU definition for nanomaterials. Holding the Group’s first multi-stakeholder dialogue on responsible chemical handling and product stewardship in Asia.
Supporting skills & innovation	Leading the organization of the closing ceremony of the 2011 UN International year of Chemistry to encourage young people to follow scientific careers. Leading the establishment of the European Institute of Innovation Technology (EIT) Foundation to increase the level of support for collaborative R&D projects in Europe and attract young people to science.
Anticipating emerging issues	A small group of experts from Public Affairs, HSE, Advanced Technologies, and Corporate Communication called Paracelsus plays a proactive role in monitoring and anticipating emerging issues in health and environment: (nanotechnologies, “micropollutants”, cocktail effects, biomonitoring, endocrine effects...) to enable the Company to take responsible actions and positions on complex issues.

## 2. Economic performance



### 2.1. Market presence

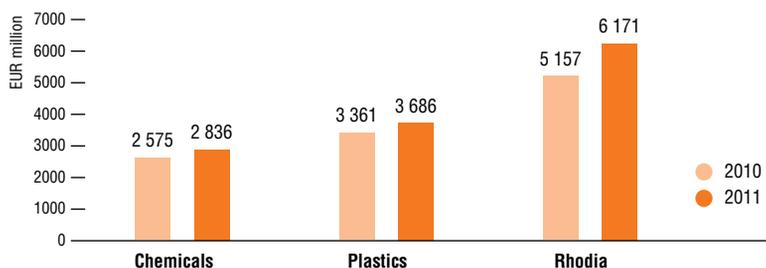
The Group's strategy is to manage a balanced portfolio of activities in terms of sustainability.

The paradigm shift that face human societies challenges that Solvay strives to provide answers on three fronts: shift in industrial activity, in organization, and in the way businesses is managed.

The cornerstone is to further develop the business portfolio so as to better offer societies of tomorrow the products and solutions they will need.

#### 2.1.1. Group net sales

Distribution by sectors, including Rhodia



	2010	2011
Solvay net sales - EUR million	11 095	12 693

Perimeter: equivalent to financial perimeter.

The pro forma figures show the income statement (1) as if the acquisition of Rhodia had become effective from the 1<sup>st</sup> of January 2010, (2) harmonizing the accounting rules and (3) eliminating the Purchase Price Allocation (PPA) impacts. Net sales comprise the sales of goods and value-added services corresponding to Solvay's know-how and core-business. Net sales exclude other revenues primarily comprising commodity and utility trading transactions and other revenues primarily deemed as incidental by the Group (e.g. temporary).

The figures are reviewed by Deloitte within the global financial audit.

More details on the economic performance of the Solvay group are to be found in the Annual Report [www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)

The Rhodia acquisition was closed on September 16, 2011. Only Rhodia's fourth quarter results are included in the Consolidated IFRS Financial Statements of the Solvay group. To give complete and comparable information, Solvay published pro forma adjusted financial results, in addition to the consolidated IFRS accounts for 2011. All comments below on business progress in 2011 relate to the pro forma figures.

Net sales for 2011 amounted to 12 693 EUR million, an improvement of 14%.

The economic context remained sustained throughout 2011 for most activities, as seen in the increased sales volumes in Chemicals (+4%), Plastics (+2%), and Rhodia (+3%).

Activity was particularly dynamic in Specialty Polymers, in Advanced Materials, and in Consumer Chemicals, with sales volumes up by 6%, 19%, and 6% respectively at constant scope, compared to the already high levels of activity in 2010. Other activities, however, were confronted with a clear slowing of demand during the final months of the year, in particular Vinyls, fluorinated chemicals and, to a lesser degree, Polyamide Materials.

2.1. Market presence      2.2. Other economic data

The share of sales in fast growing regions improved markedly, with the Solvay group realizing 40% of its 2011 sales in Latin America, Asia, and in the rest of the world.

REBITDA for 2011 amounted to 2 068 EUR million compared to 1 862 EUR million in 2010, or an increase of 11%. Priority was given to cash generation, especially in the 4<sup>th</sup> quarter, resulting in a considerable reduction in inventories.

#### Chemicals sector

The improved REBITDA in the Chemicals sector (+4% to 491 EUR million). For Essential Chemicals it was up by 9%, sustained by increased demand across most activities and a good profitability, with sales price increases more than compensating the higher costs of energy and some raw materials. Despite a very good first half, the REBITDA of Special Chemicals was down owing to a sharp slowing of activity during the last months of the year.

#### Plastics sector

The REBITDA in the Plastics sector again improved, rising by 6% to 590 EUR million is explained by the record operating performance of Specialty Polymers in a context of very sustained activity, with higher sales prices, significantly improved industrial performances and a better product mix taking the REBITDA/

net sales margin for this activity to a much improved 29%. Vinyls results came under strong pressure from late summer onwards despite major cost-reduction efforts, with REBITDA down by 4% to give a REBITDA/net sales margin of 9% compared to 10% in 2010.

#### Rhodia sector

Rhodia sector posted a strong 16% progression to a record 1 119 EUR million REBITDA, illustrating the successful execution of its profitable growth strategy and confirming the ambitions placed in this acquisition. The sector benefited from its high quality, resilient portfolio, its strong exposure to fast growing regions and its excellent pricing power. Overall volumes progressed by 3%.

Furthermore, the Feixiang acquisition, consolidated since December 2010, maintained its double-digit growth. In a context of global inflationary raw material and energy costs, the sector's pricing power generated a net positive impact on REBITDA of 158 EUR million in the year. By segment, Consumer Chemicals and Advanced Materials were powerful growth engines, with REBITDA growing by over 30% to 364 EUR million and 267 EUR million respectively. REBITDA at Polyamide Materials was down by 23% after a very strong 2010 and a weakened activity in the second half of the year. Acetow & Eco services, operating in more mature businesses segments,

saw sustained business dynamics throughout the year. Energy Services remained stable.

REBITDA at New Business Development amounted to -53 EUR million, reflecting research & development efforts in promising and important areas for development of the Group outside its traditional activities.

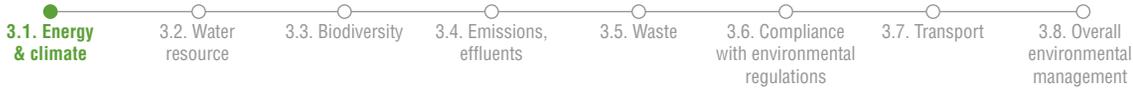
REBITDA at Corporate and Business Support was -79 EUR million against -80 EUR million last year.

## 2.2. Other economic data



More details on the economic performance of the Solvay group (including Rhodia) are to be found in the Annual Report 2011.

[www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)



# 3. Environmental performance

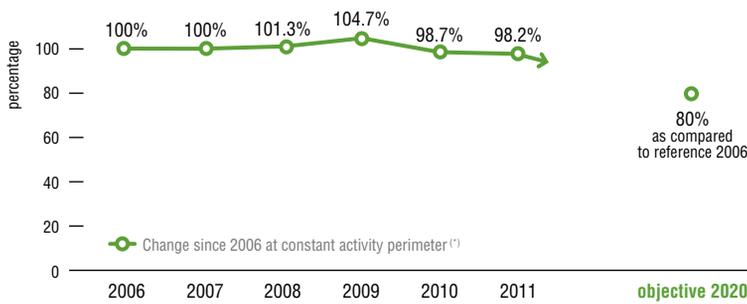
## 3.1. Energy & climate

Solvay has chosen to focus on two main objectives related to energy and greenhouse gases: on the one hand to improve the energy efficiency of its production processes through realistic solutions that are compatible with the specific energy requirements of a heavy industry; on the other hand, to reduce its greenhouse gas emissions as far as technically and economically feasible and, of course, in line with regulations.

Ensuring long-lasting energy supply is also a permanent concern. Diversifying energy sources and looking for alternatives to fossil fuels wherever they are sustainable in ecological, economic, industrial, and social terms is a strategic goal. This materializes in heavy technical investments or in partnerships or contractual arrangements extending over a long period.

### 3.1.1. Energy consumption (GRI EN3 - EN4)

Energy of primary fuels (coal, gas, fuel oil...) + Energy purchased (steam, electricity)



 **To reduce energy consumption by 20% in 2020 as compared to 2006, at constant activity perimeter.**

The projects under way or which are identified have the potential to bring Solvay close to the 2020 objective. Within the coming three years, savings in primary energy inherent to projects that have been decided or foreseen in the 2011 budget, should have reached respectively 6.5% and 9% as compared to the reference year 2006 and at constant activity perimeter.

New initiatives in the frame of the new GBU Solvay Energy Services are also under way.

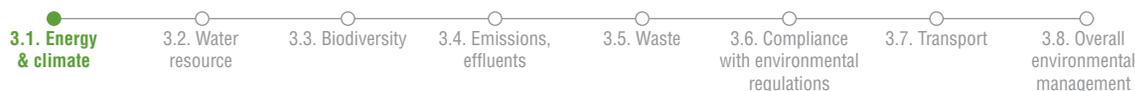
(\*) The Group's overall energy consumption expressed in % at constant activity perimeter i.e. as compared to 2006 after correction for changes in production volumes and in the perimeter of the Group's activities.

□ Without correction for change of perimeter

	2006	2007	2008	2009	2010	2011
Energy consumption - 1 000 Terajoules	194.8	199.0	193.3	173.1	201.6	205.6

Perimeter: equivalent to manufacturing perimeter under operational control.  
 These figures cover the total energy consumption related to Solvay's manufacturing activities. These include the consumption of energy produced internally (from oil, gas, coal consumed) and purchased (electricity, heat).  
 More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

reviewed by E&Y  
 See pp. 122-123   
 Ernst & Young (E&Y) Company Auditors SCCRL was commissioned to audit the reliability of key elements of Solvay's Sustainable development reporting.



### Recent trends

The increase in absolute energy consumptions in 2011 (+4 000 TJ) compared to 2010 is due to the higher level of production this year, and mainly (2 900TJ) to changes in the reporting perimeter, with the inclusion of additional sites in particular the new power unit Solalban (AR) (which supplies Solvay's manufacturing activities and also sells electricity to third parties), the power co-generation of Bernburg (D) and the acquired soda ash plant of Alexandria (EGY).

In 2009 and early 2010, large reductions were recorded in absolute energy consumption and greenhouse gas emissions but relative energy consumption increased (when taking into account production volumes), expressed at constant activity perimeter. These changes were attributable to the under-utilization of production capacities which resulted in lower overall energy efficiency.

### Meet the 2020 objective.

Their parallel approaches are followed:

- After contributing to deploy energy-efficient cogeneration power plants within a program extending from the 90's to 2000's, a new series of cogeneration projects are now being considered, in Europe, Brazil, and the US.
- The new internal pole of excellence in energy efficiency Solwatt aims at identifying energy savings in existing units, via technologies improvements, management behavior. Three sites have been fully investigated, as a first phase of this three year project that should be extended to all concerned sites by end 2013.
- New or revamped plants are optimized regarding energy consumption. For example, two new membrane electrolysis plants, one in Lillo (B), the other in Tavaux (F), representing major investments and energy savings of around 17%, will come on-stream within one year.

### Achievements

- In Bernburg (D), the reuse of regional recyclable waste to produce energy, has been on-stream since 2010, avoiding 350 000 t of CO<sub>2</sub> emissions par year.
- In Devnya (BG), since the beginning of 2011 -17 000 t of biomass waste have been fed to the power plant, in substitution of coal.
- Solvay is also looking with other partnerships in Brazil to produce electricity from hydroelectric concessions.
- To facilitate the access to the electricity supply, in France, Solvay is a member of the Exeltium electricity buying consortium which comprises 40 industrial groups including also Rhodia since 2010. Solvay is taking part in setting up a similar structure grouping six major industrial companies operating in Belgium, called the Blue Sky project.
- To following project should also be highlighting for their optimized energy efficiency: the new epichlorohydrin production plant in Map Ta Phut (THA) based on the Epicero<sup>®</sup> process.



### Reporting

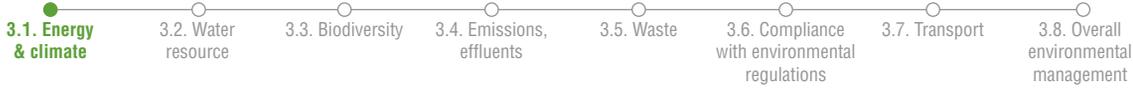
Solvay supports through active participation the World Business Council for Sustainable Development (WBCSD)'s project the development a guidance document to promote more standardized reporting approaches within the chemical sector. Solvay has also signed the WBCSD Manifesto for Energy Efficiency in Buildings. The manifesto and its accompanying implementation guide aim at mobilizing WBCSD member companies to improve the energy performance of their commercial buildings as outlined in the WBCSD.

- Once operational, RusVinyl will be the first world-scale site for the production of vinyl, with maximum energy efficiency and minimal raw materials consumption. It will produce in Kstovo (RUS) 330 000 t of PVC per year.

### Future projects

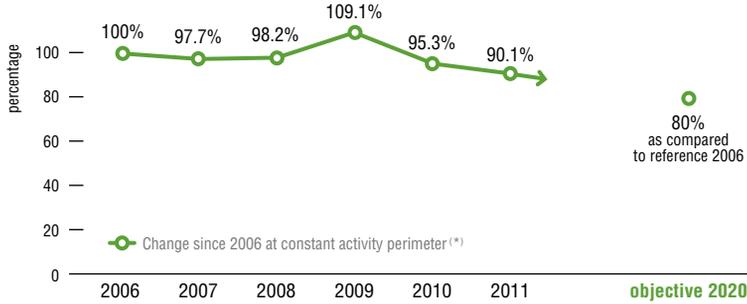
As for the future, a series of technological breakthroughs will improve the global energy efficiency of Solvay's operations:

- In Alexandria (EGY), Devnya (BGR), and Torrelavega (ES), technical improvements of the plants manufacturing soda ash (sodium carbonate).
- In Bahia Blanca (AR), Jemeppe (B), Tavaux (F), Martorell (ES), and Rheinberg (D) the substitution of the R22 refrigerant.
- In Green River (USA), the recovery of methane in the mine, that will avoid emissions equivalent to 240 000 t of CO<sub>2</sub> per year. Since 2011 the methane extracted from the mine is incinerated, preventing this greenhouse gas to be emitted. In 2012 the heat generated by the combustion of the recovered gas will start being used in the process, bringing additional savings.
- The access to renewable fuels continues to be explored, with a project in Dombasle (F) currently being studied by French authorities. It should allow the incineration of renewables with only minor adaptations to the existing incinerators. Also, a letter of intention has been signed with the Antwerp Harbour to study a project of a major biomass power plant.
- In Tavaux (F), however, the biomass-energy project under study is abandoned, the partner being unable to guarantee competitive biomass supply.



### 3.1.2. Greenhouse gas emissions in relation to manufacturing activities (GRI EN16)

Kyoto Protocol – Scope 1 + 2 (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, PFCs, HFCs)



(\*) Emissions of greenhouse gases expressed in % at constant activity perimeter i.e. as compared to 2006 after correction for changes in production volumes and in the perimeter of the Group's activities.

Without correction for change of perimeter

	2006	2007	2008	2009	2010	2011
Direct & indirect CO <sub>2</sub> emissions (Scope 1+2) - Million tons equivalent CO <sub>2</sub>	11.7	11.9	11.6	10.2	12.8	12.3
Other greenhouse gases (Kyoto Protocol) - Million tons equivalent CO <sub>2</sub>	3.0	3.0	2.9	3.0	2.4	2.2
<b>Total greenhouse gases (Kyoto Protocol) - Million tons equivalent CO<sub>2</sub></b>	<b>14.7</b>	<b>14.9</b>	<b>14.5</b>	<b>13.2</b>	<b>15.2</b>	<b>14.5</b>

Perimeter: equivalent to manufacturing perimeter under operational control.

These figures encompass the six greenhouse gases covered by the Kyoto Protocol (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, PFCs, HFCs).

More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

**To reduce greenhouse gas emissions, both direct and indirect (attributable to purchased energy) in relation to Solvay's manufacturing activities, by 20% in 2020 as compared to 2006 at constant activity perimeter.**

Even though production volumes increased in 2011 as compared to 2010, the Group has succeeded in reducing its GHG absolute emissions. This was made possible in particular by purchases of lower carbon electricity (e.g. within Exeltium in France), steam production from regional recycled wastes in Bernburg and reduction of emissions of fluorinated gases in Bad-Wimpfen and in Frankfurt (D).

Since 2006, emissions of Ozone Depletion Potential (ODP) gases have decreased by an additional

41%. This significantly contributes also to reducing GHG emissions, since these gases have significant greenhouse potentials. Technical improvements, lead in particular to important emissions reductions of the refrigerants R22 and CFC-12 and of tetrachloromethane. The substitution of refrigerants is progressing well.

See 3.4.3. Environmental impact indicators – Air & water, on p. 39.

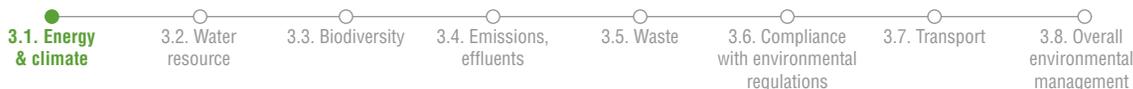
- Cogeneration units;
  - Project Solwatt;
  - New production units;
  - Biosourced energy.
- See 3.1.1. Energy consumption, on p. 29.

#### Changing perimeter

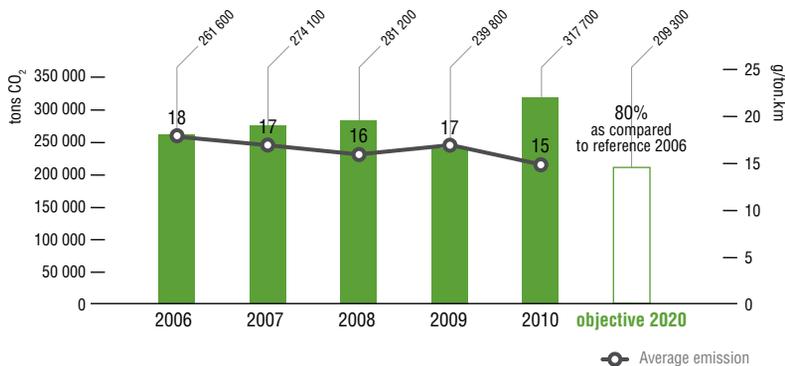
The increase of GHG emissions between 2009 and 2010 in absolute terms were due to the resumption of production levels after 2009, and to the inclusion in the perimeter of Solvay emissions which together represent around 0.9 million t of CO<sub>2</sub> of:

- The emissions of the new power unit Solalban (AR), which supplies Solvay's manufacturing activities but also sells electricity to third parties;
- The emissions of the power cogeneration unit of Bernburg (D);
- The emissions of the newly acquired soda ash plant of Alexandria (EGY).

reviewed by E&Y 2011  
See pp. 122-123



### 3.1.3. CO<sub>2</sub> emissions associated to the transport of finished products (GRI EN16)



	2006	2007	2008	2009	2010
Total million tons	12.95	13.29	13.33	11.02	12.88
Total million tons.km	14 500	16 000	17 100	14 200	21 000
Average distance (km)	1 120	1 210	1 290	1 290	1 630

*Perimeter: products transported intra-Europe & from Europe to the rest of the world  
 No data available for 2011: the reporting is currently being reshaped. The reporting system covers the transport of products manufactured in Europe and will be further expanded.  
 Road transport represents 10% of all tons.km, and sea transport 85%, in 2010. There is an (marginal) increase in CO<sub>2</sub> emissions due to growth of air transport of speciality polymers, much less than 1% of tons.km.*

**To reduce by at least 20% the CO<sub>2</sub> emissions related to the transport of Solvay products between 2006 and 2020.**

**There is not data reported for 2011. The reporting is indeed currently being reshaped to better follow progress in CO<sub>2</sub> related to transport (most often carried out by third parties).**

In the meantime, Solvay focuses the program on the assessment of best practices (intrinsic potential and practicality for implementation), which are about to be further studied with the Rhodia sector.

The major changes under way in the Group's transport decarbonization policy materialize in its call for tenders (triennial); only marginal improvements are possible in the course of the contract periods.

Businesses have made investments which will bear fruit in the short term. For example, SolVin has built a new multi-modal platform in Tavaux.

In 2010, the trends stemmed from more export on longer distances, with a much larger proportion of marine transport for soda ash, resulting in increase in absolute terms but reduction in CO<sub>2</sub>/km.

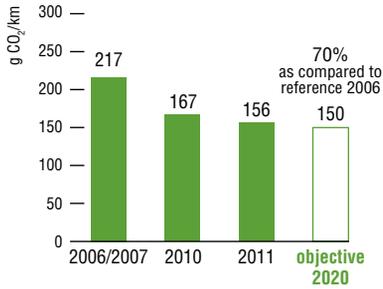
Decreasing the overall CO<sub>2</sub> impact of transport will be pursued wherever possible and cost-effective, in particular for ponderous products: soda ash, PVC, caustic soda, and peroxides. Alternatives to road were adopted in the past years. However, the development of new markets that are distant from manufacturing locations with poor transport facilities (e.g. Russia) may sometimes increase the transport of products and their CO<sub>2</sub> impact. Reductions of the "carbon footprint" of the supply chains are undertaken in partnership with suppliers because most transportation of Solvay's products is outsourced.

Approaches and programs towards the objective are regularly assessed:

- Modal shifts (e.g. shifting from road to multi-modal transport such as rail-road mix);
- Transport optimization (increasing the load factor of trucks, less empty kilometers...);
- Technology (Euro5 trucks...);
- Behavior (eco-driving: slow steaming for ships, adapted speed for trucks...).



**3.1.4. CO<sub>2</sub> emissions by car fleet (GRI EN29)**



	2006 / 2007	2010	2011
Number of cars	1 369	1 233	1 278
Million kilometers	36.4	26.2	29.4
Tons CO <sub>2</sub> /year/car	5.8	3.6	3.6
Total annual - Tons CO <sub>2</sub>	7 895	4 392	4 600

*Perimeter: representative of full perimeter for the parameter.  
Data from car fleet companies. Car's technical emissions as defined by the Original Equipment Manufacturers (OEM).  
EuroFleeting fleet management operations (BE, ES, FR, IT, PT), CPM German Fleet operator (GR) and American Fleet manager.*

**To reduce by at least 30% the CO<sub>2</sub> emissions related to Solvay's car fleet.**

**The objective has been reached in 2011, leading to significant reduction of CO<sub>2</sub> emissions for the European & American Fleets. This achievement - considering the 2020 deadline - results from Solvay's car policy and from truly improved vehicles' efficiency that leads to fuel economy and lower emissions.**

The reduction obtained in European countries (especially in BE, FR, IT, PT, ES, and DE) of -31% expressed in g/km (-50% in total emissions) is

mainly due to the change in the fleet structure, with a higher proportion of status cars with lower annual mileage.

Solvay's car fleet in the past years included a large proportion of cars used by medical representatives of Solvay's Pharmaceuticals sector. Since the divestment of the Pharmaceuticals sector, the fleet is mainly composed of status cars, with a small number of utility vans used only into the plants.

**Eco Fleet Management**

The Eco Fleet Management Concept is implemented in Belgium, France, Italy, Spain, and Portugal and is being implemented in Luxembourg, Netherlands, and the United Kingdom. It aims at better selecting, managing, and monitoring the fleet along both its ecological and economic dimensions.

The "Drive low CO<sub>2</sub>, drive less, drive better" includes:

- Incentives (Bonus/Malus system);
- Technical monitoring of real car emissions;
- Support tools in European countries (operating the major fleets) encouraging drivers to choose cars with a lower environmental footprint;
- Team work to identify further potential progress.

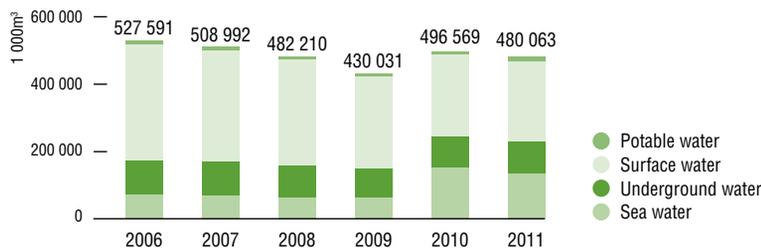


## 3.2. Water resource

Access to water resources is a growing concern worldwide. Industry is not the major user among all water usages. However, the industrial use of water can become an issue particularly in dry regions where water resources are scarce or in heavily populated areas. The largest proportion of water abstracted by Solvay from the natural environment is cooling water, which returns back to the environment for the largest part.

Solvay also develops products and services aimed at improving the efficiency of water use such as filtration membranes and essential products for water disinfection and purification.

### 3.2.1. Water intake (GRI EN8)



**To reduce the use of freshwater by Solvay manufacturing processes and especially in the sites which are located in regions under water stress, and better manage water intake.**

**The consumption of freshwater (excluding sea water) has been reduced by 25% since 2006. The overall water intake has been reduced by 9% in the same period. The figures represent the intake of water by Solvay installations. Net intakes are much lower, as the largest part is returned back to the natural surface water.**

In these locations where water is particularly scarce such as in Martorell (ES) and in Bahia Blanca (AR), significant reductions of water intake have been achieved, are under way, or are planned.

Solvay strives to reduce the net use of fresh water by promoting techniques to recycle used water, even from external sources, and by using lower quality water, such as sea water, and by adequately treating the final waste water flow.

Particularly for plants located in regions under water stress, a dedicated Group program has been launched. Its main elements are:

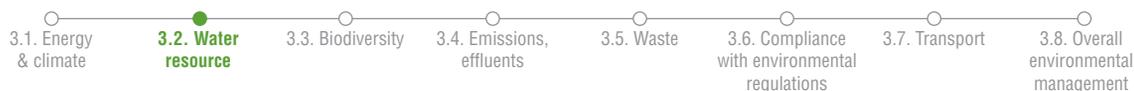
- The validation of water balances with the site;
- The comparison with theoretical consumptions;

reviewed by E&Y See pp. 122-123

	2006	2007	2008	2009	2010	2011
Potable water - 1 000m <sup>3</sup>	9 755	9 150	8 727	8 130	7 702	13 672
Surface water - 1 000m <sup>3</sup>	342 428	328 392	314 159	270 882	243 117	234 231
Underground water - 1 000m <sup>3</sup>	102 650	99 216	92 219	86 143	92 067	94 978
Sub-total - 1 000m <sup>3</sup>	454 833	436 758	415 105	365 155	342 886	342 881
Sea water - 1 000m <sup>3</sup>	72 758	72 234	67 105	64 876	153 683	137 182
<b>Total - 1 000m<sup>3</sup></b>	<b>527 591</b>	<b>508 992</b>	<b>482 210</b>	<b>430 031</b>	<b>496 569</b>	<b>480 063</b>

Perimeter: equivalent to manufacturing perimeter under operational control.

The figures give the quantities of abstracted water. Net consumptions (net intake) are much lower, as the largest part (e.g. cooling water) is returned back to the natural surface water. As an example, in 2010, 359 Mm<sup>3</sup> freshwater were abstracted, but the real net consumption (abstracted water minus volumes returned to the environment) amounted to only 86 Mm<sup>3</sup>.



- The definition of priorities and action plans to reduce water intake and exposure to water stress: simple measures of good housekeeping, adjustment of process parameters, water recycling in the same manufacturing unit after adequate treatment (already adopted for some PVC plants), reuse in other process of different types of water like steam condensates, cooling water, or process water;
- At production site level, the reduction of the exposure to water stress due to risks to existing water sources can be obtained by valorization of alternative water sources which include a.o. use of retreated waste water from third parties' facilities, use of water pumped from confinement wells of Solvay sites (including additional treatment or not), etc.

#### Recycling scheme in Tuscany

In Tuscany, the consortium Aretusa (Azienda Servizi, Ambientali, Termomeccanica), and Solvay, recycle since 2006 wastewater from the domestic municipal treatment plant as process water in Solvay installations, after adequate re-treatment. This leads to a very strong, recurrent reduction (about 4 million m<sup>3</sup>/y) of water abstraction from groundwater in the region of Bassa Val di Cecina (IT).

#### Solvay embarks on water savings in the framework of "E4Water"

Solvay has just embarked on "demonstration projects" in the framework of "E4Water" under the umbrella of European Union's FP7 program<sup>(\*)</sup>. E4water for Economically and Ecologically Efficient water management in the European chemical Industry, and is just starting now, with an overall budget of 17 EUR million.

The objective of E4water is to bring key water saving approaches up to the industrial scale level (E4water for Economically and Ecologically Efficient water management in the European chemical Industry, and is just starting now, with an overall budget of 17 EUR million).

The 19 partners from the chemical industry (Procter and Gamble, Dow, Total...) together with technology suppliers and academics will demonstrate new possibilities of saving water in the chemical industry. Each of the industrial partners will carry out a demonstration, in collaboration with a public research counterpart.

Solvin and Solvic are two partners of the scheme. The objective of E4water is to bring key water saving approaches up to the industrial scale level.

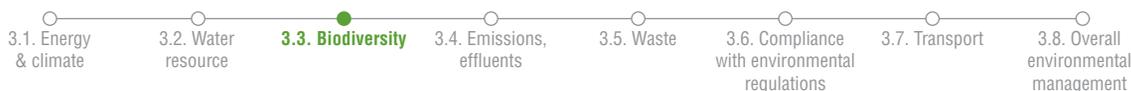
#### Solvin, on the site of Martorell (ES), will take back effluents from the PVC manufacturing unit, adding additional post-treatment to get demineralized water, enabling water recycling within the same manufacturing units.

As much as around 100 m<sup>3</sup>/h (900 000 m<sup>3</sup>/y) additional recycling can be anticipated. This new "water loop" will add to the current internal recycling loops already active for four years (internal loops: used water from PVC polymerization batches is filtered and then recycled in the other PVC polymerization batches, allowing for recycling rates of 60%).

The demonstration could then be extended to other Solvay PVC plants.

**Solvic, in Lillo (B), will demonstrate new possibilities of industrial synergy (closing loops over an industrial area) by setting up new water saving schemes that close loops between entities/partners.** The project indeed will also involve Solvic's industrial neighbors in the industrial area of the Harbor of Antwerp. Together, they will first make an inventory of all water flows and aqueous effluents that are potentially recyclable. They will then select water streams that are the most suitable for recycling, and install the necessary additional treatment modules, making water "circular economy" a reality in this area.

<sup>(\*)</sup> This project is also promoted by the SusChem program of Cefic. The duration of this project is four years.



## 3.3. Biodiversity

Solvay is mainly concerned by the natural areas that the Group owns and manages, such as mines, quarries, and storage areas for large volume of non-dangerous residues, for which there is a long history of green rehabilitation.

Solvay is also willing to push a sustainable chemistry that respects biodiversity. This is particularly important when developing chemical processes based on biosourced raw materials or energy – such as glycerine from palm oil used for its Epicero® process or biosourced ethylene derived from sugar cane – that could be used as raw material for PVC production in Brazil. For more than ten years now, Solvay with SolVin also supports international scientific missions on biodiversity.

### 3.3.1. Natural areas & land rehabilitation (GRI EN20)

	2011
Sites with large natural areas - Hectares	8 000
Natural areas managed as a "green area" (rehabilitation, plantation...) - Hectares	1 600

Perimeter: representative of full perimeter for the parameter.



**To rehabilitate natural spaces, keep impact of Solvay activities on biodiversity to a minimum by reducing water abstraction in regions and ecosystems under water stress, by controlling emissions avoiding in particular the release of persistent organic pollutants. To check that biosourced materials respect biodiversity.**

**Stretched over many years, large-scale rehabilitation programs of natural areas are on-going in many Solvay sites. In particular, the rehabilitation of old dikes and quarries on Solvay's lands**

**is a continuous process since decades. Around 1 600 ha have been rehabilitated, often replanted with trees. Solvay maintains over 8 000 ha of natural areas around its sites,** where biodiversity is also protected from housing or roads. Some of the rehabilitated areas are even now recognized as nature reserves to be protected.

See 3.2.1. Water intake, on p. 34.

See 3.4. Emissions, effluents, on pp. 37-42.

Since more than ten years now SolVin and Solvay give support to international scientific missions aiming at inventoriating the biodiversity of preserved areas of the world. The last mission took place in Mozambique in 2010 and other missions are scheduled in 2012 in Laos and in Papua-New Guinea.

See: <http://laplaneterevisitee.org/en/77/home>





## 3.4. Emissions, effluents

The control and reduction of the environmental impact of Solvay's activities is a constant drive, in line with its commitment to the Responsible Care® Global Charter. Globally the emissions to air, water, and soil were dramatically reduced during the last twenty years. The Group is committed to further align the environmental performance of each plant to the same, high standards worldwide, using the environmental Best Available Techniques (BATs<sup>(1)</sup>) as benchmark.

Improving environmental performance is carried out along five main axes:

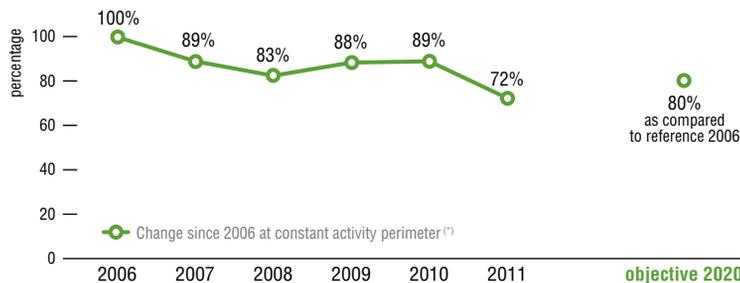
- Ensuring compliance with permits, avoiding permit accidental infringements;
- Identification of projects aimed at complying with BATs and reaching the overall strategic goals of -20% emissions to air and -20% emissions to the water between 2006 and 2020<sup>(2)</sup>;
- Pursuing the objectives of -20% in energy consumption and -20% in greenhouse gas emissions;
- Compliance with voluntary branch commitments regarding environmental performance – a.o. European chlorine manufacturers (Eurochlor) or European Council of Vinyl Manufacturers (EVCN) charters and commitments, supplementing or going further than the BATs;
- Seeking high environmental performance in new production plants.

<sup>(1)</sup> The various BATs set by the European Union are covering Solvay's major industrial productions.

<sup>(2)</sup> The Global Water Emission Index and the Global Air Emission Index have been defined by Solvay. They are aimed at giving an overall image of trends in emissions of all pollutants that are relevant to its activities (these indicators have been followed since 1993, and the weighting factors recently reviewed). More information on the definition and scope of energy indicators and environment indicators: see "Energy, greenhouse gas and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Rhodia)" on pp. 118-120.

### 3.4.1. Overall air emissions (GRI EN20)

Global Air Emission Index (GAEI)



**To reduce by at least 20% overall air emissions due to manufacturing activities between 2006 and 2020 at constant perimeter.**

**Overall, the Global Air Emission Index (GAEI) has decreased by 28% compared to 2006. Therefore, the air emissions reduction objective is already reached.**

Compared to 2010, the GAEI of the Group decreased by 423 teq in 2011, corresponding to -17% at constant perimeter. This important additional reduction is mainly associated to the installation in 2011 of a second by-products and waste incinerator in the PVC production plant of Santo Andre (BR).

The rise observed previously between 2008 and 2009/2010 of the indicator calculated at constant activity perimeter was mainly related to lower business volumes these years, due to the world economic downturn. This under-utilization of the production capacities resulted in their lower global efficiency, thus to increased specific air emissions.

<sup>(1)</sup> Overall air emissions expressed in %, at constant activity perimeter, i.e. as compared to 2006 after correction for changes in production volumes and in the perimeter of the Group's activities.

□ Without correction for change of perimeter

	2006	2007	2008	2009	2010	2011
Global Air Emission Index - Kilotons equivalent	2.51	2.35	2.09	1.98	2.25	1.83

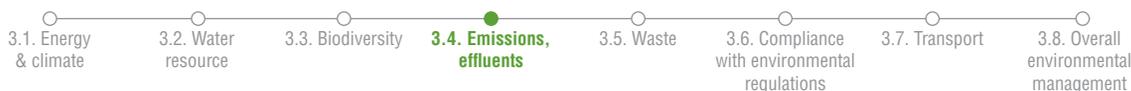
Perimeter: equivalent to manufacturing perimeter under operational control.

The overall air emissions of the newly acquired soda-ash plant in Egypt are reported for the first time in 2011. Its historical emissions (period 2006 - 2010) were estimated based on the data reported for 2011 and were added to the Group data, in order to be able to recalculate the performance progress since 2006 at constant perimeter.

More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

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See pp. 122-123





Other significant progress in reducing air emissions was already obtained in various areas: as, for example with the program to reduce dust emissions from energy production units. Other examples worth to mention include the 30% reduction in methane emissions from subterranean origin

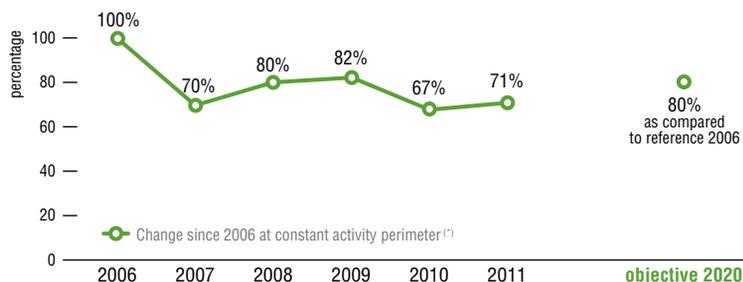
that were emitted during trona (natural soda) extraction in Green River (USA) and that are now captured and used.

For a much tighter control of air emissions, back-up incinerators for waste gases are now also on stream in Bahia Blanca (AR).

The technological potential necessary to progress further has been assessed and a portfolio of projects has been identified.

### 3.4.2. Overall water emissions (GRI EN20)

Global Water Emission Index (GWEI)



(1) Overall water emissions expressed in %, at constant activity perimeter, i.e. as compared to 2006 after correction for changes in production volumes and in the perimeter of the Group's activities.

Without correction for change of perimeter

	2006	2007	2008	2009	2010	2011
Global Water Emission Index - Kilotons equivalent	5.51	4.05	4.54	3.89	3.76	4.14

Perimeter: equivalent to manufacturing perimeter under operational control.

More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

#### New plants with reduced water emissions in Thailand

The production process used in the new and largest hydrogen peroxide production plant in the world in Thailand will very significantly minimize the environmental impact through limited emissions in wastewater. This new production unit is based on Solvay's proprietary, high-yield hydrogen peroxide technology.

The world-class bio-sourced epichlorohydrin plant based on Solvay's innovative Epicerol® technology, in Thailand is also characterized by significantly lower water emissions than the standard production process. The Epicerol® technology is based on the transformation of glycerin, a by-product from refining vegetable oils into biofuel. The technology reduces very significantly the amounts of chlorinated by-products.

**To reduce by at least 20% the overall water emissions due to manufacturing activities between 2006 and 2020 at constant activity perimeter.**

**To control and treat gaseous and liquid effluents; continuously reducing the emissions resulting from the Solvay group industrial operations and minimizing the risk of accidental releases.**

**The technological potential necessary to reach the -20% objective has been assessed and the portfolio of projects identified.**

The program to benchmark all key manufacturing plants worldwide to the environmental requirements of Best Available Techniques (BATs) is now completed, allowing identification of priorities. A number of projects under way have already contributed to the reduction of overall emissions to water.

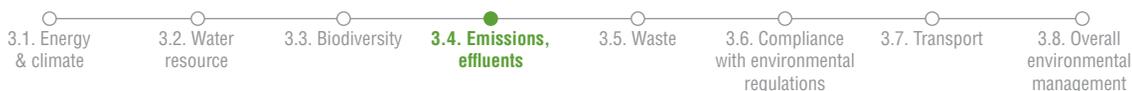
However, at constant perimeter, in 2011, the Global Water Emission Index (GWEI) increased by 4% or 0.38 kteq as compared to 2010.

This is mainly due to two reasons:

- Transitory emissions a plant associated to temporary technical problems in a wastewater treatment unit;
- Higher concentration of metals in mining raw materials and in coal used in the lime kilns of some of Solvay soda-ash plants.

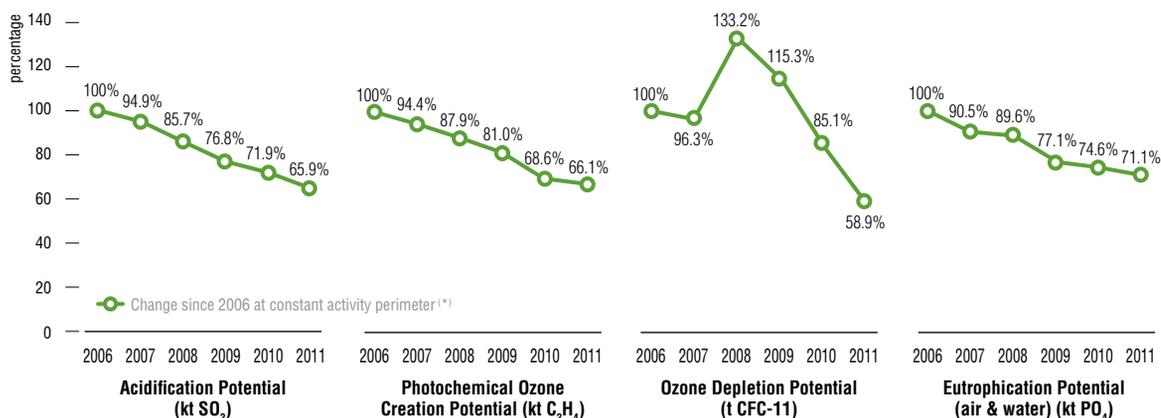
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### 3.4.3. Environmental impact indicators – Air & water (GRI EN19)

Acidification Potential, Photochemical Ozone Creation Potential, Ozone Depletion Potential, Eutrophication Potential



(\*) Emissions expressed in %, at constant activity perimeter, i.e. as compared to 2006 after correction for changes in production volumes and in the perimeter of the Group's activities.

□ Without correction for change of perimeter

	2006	2007	2008	2009	2010	2011
Acidification Potential (AP) - Kilotons equivalent SO <sub>2</sub>	36.38	35.39	31.88	23.77	24.77	23.09
Photochemical Ozone Creation Potential (POCP) - Kilotons equivalent C <sub>2</sub> H <sub>4</sub>	27.98	27.39	25.36	20.36	19.05	18.36
Ozone Depletion Potential (ODP) - Tons equivalent CFC-11	31.38	32.53	42.06	32.72	28.51	19.74
Eutrophication Potential (EP) (air & water) - Kilotons equivalent PO <sub>4</sub>	7.02	6.55	6.45	4.58	5	4.93

Perimeter: equivalent to manufacturing perimeter under operational control.

More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

Together with its global air and water indexes that assess the overall performance, Solvay follows and reduces five individual impact indicators that are internationally recognized: global warming (see 3.1.2. Greenhouse gas emissions in relation to manufacturing activities, on p. 31), acidification, photochemical ozone creation, ozone depletion potential, and eutrophication.

Additional reduction of emissions have been obtained between 2006 and 2011 for all five key impact indicators: respectively by 10%, 34%, 34%, 41%, 28%, considered at constant activity perimeter.

Additional projects such as the program to shift to oxygen-based oxychlorination in the PVC plant of Bahia Blanca (AR) or the original zero-discharge concept that allow

higher production volumes with no additional emissions to water for the recently acquired site in Panoli (IN). This will further improve emissions indicators and encounter the objective to deploy intrinsically cleaner technologies.

#### Recent progress

##### Acidification Potential

Over the last 5 years, a very drastic reduction of these emissions was achieved, with a drop of 35% since 2006.

Compared to 2010, the emissions of acidifying substances were further diminished by 1.7 kteq of SO<sub>2</sub> or 7% at constant perimeter.

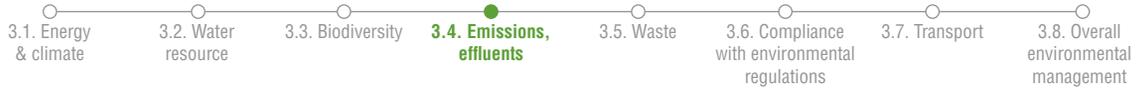
The main reason for the reductions in the last two years was the installation of a new Continuous Fluidized Bed (CFB) boiler in the Deven (BG) plant, and firing coal with a lower sulfur content. The boiler is equipped with a desulfurization system (injection of limestone) and a Selective Non Catalytic Reduction for NO<sub>x</sub> abatement through ammonia injection.

##### Photochemical Ozone Creation Potential

Compared to 2010, the Group's impact was further reduced by 0.7 kteq Non-Methanic VOC (see 3.4.4. Emissions to air - Additional specific parameters, on pp. 44-45) or 5% at constant perimeter. This results in particular from improved NO<sub>x</sub> control in a combustion plant and from reduced emissions of VOCs in a PVC production plant.

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See pp. 122-123





**Ozone Depletion Potential**

Globally, this indicator shows an additional decrease of 41% since 2006.

Compared to 2010, emissions of gases with an ozone depleting potential decreased by 8.8 teq CFC-11, or 26% at constant perimeter. In 2008 the Group emissions of ODP gases rebounded due to accidental leakages of refrigerant liquid in cooling units. Technical improvements lead to important emission reductions of the refrigerants R22 and CFC-12 and of

tetrachloromethane. The substitution of refrigerants with an ODP, when still used, is progressing well, in particular in Santo André (BR) and in Bahia Blanca (AR), Jemepe (B), Tavaux (F), Martorell (ES), and Rheinberg (G).

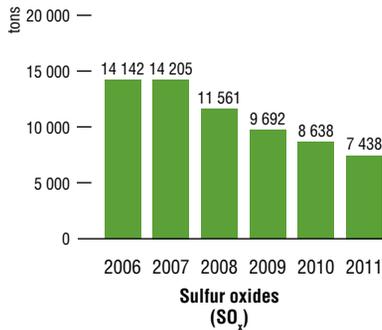
**Eutrophication Potential**

Compared to 2006, the impact of the Group on the eutrophication of fresh and marine water systems decreased by almost 30%, essentially thanks to the reduction of NO<sub>x</sub> emissions. The ammonia

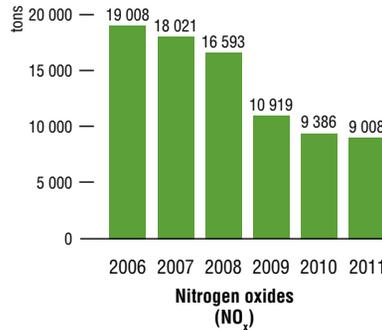
emissions to air (NH<sub>3</sub>) as well as the emissions to water (NH<sub>4</sub>) from the newly acquired soda-ash plant in Egypt were integrated in 2011 and their contribution recalculated for the whole period 2006-2011.

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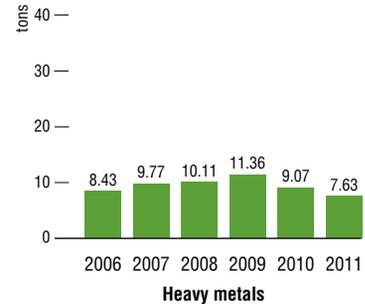
**3.4.4. Emissions to air - Additional specific parameters (GRI EN20)**



Perimeter: whole Solvay group at constant perimeter. Sulfur oxides (SO<sub>2</sub>) are emitted with the combustion of sulfur contained in fossil fuels (mainly coal) and contribute to acidification. These emissions are incorporated into the Global Air Emission Index.

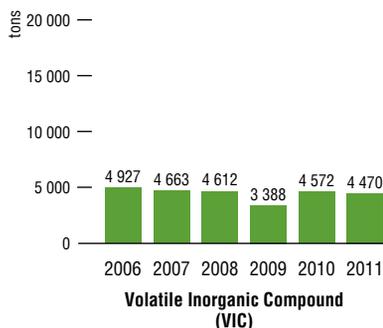


Perimeter: whole Solvay group at constant perimeter. Nitrogen oxides (NO<sub>x</sub>) emissions result from the combustion of fossil fuels (coal, fuel, natural gas). These emissions are integrated into the Photochemical Acidification and the Photochemical Ozone Creation Potential indicators, as well as into the Global Air Emission Index.

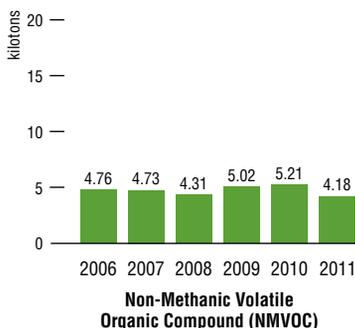


Perimeter: whole Solvay group at constant perimeter. Heavy metals (HM) are present in the fly ashes of coal fired boilers. The measurement of the amounts released with dust emissions has been extended to more combustion plants operated by the Group, even when this is not required by operating permits. The sum parameter HM is the sum of the releases of the eight HM subject to the E-PRTR(\*) reporting: As, Cd, Cr, Cu, Hg, Ni, Pb, and Zn.

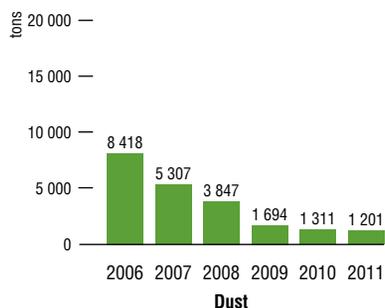
(\*) The European Pollutant Release and Transfer Register (E-PRTR) is the Europe-wide register that provides easily accessible key environmental data from industrial facilities in European Union Member States and in Iceland, Liechtenstein, Norway, Serbia, and Switzerland. It replaces and improves upon the previous European Pollutant Emission Register (EPER).



Perimeter: whole Solvay group at constant perimeter. Volatile inorganic compounds (VIC) include the emissions of some corrosive pollutants such as ammonia, hydrochloric acid, hydrofluoric acid, nitric acid, chlorine, fluorine, and hydrogen sulfide.



Perimeter: whole Solvay group at constant perimeter. The new definition recently adopted for the sum parameter Non-Methanic Volatile Organic Compounds (NMVOC) is the definition of the European Solvent Directive (1999/13/EC): all organic compounds with a standard boiling point lower than or equal to 250°C are included, with the exception of methane.



Perimeter: whole Solvay group at constant perimeter.

More information on definition and scope of energy indicators and environment indicators, see: Energy, greenhouse gas, and environmental emissions monitoring and reporting – Definitions and assumptions for the Solvay Chemicals & Plastics (not covering Solvay Rhodia) in this document on pp. 118-120.

### Sulfur oxides (SO<sub>x</sub>)

Since 2006, the SO<sub>x</sub> emissions were reduced by 47%.

In 2011 the global SO<sub>x</sub> emissions of the Group were reduced by 1 200 t or 14%.

The main reason for the reductions in the last two years is the installation of a new Continuous Fluidized Bed (CFB) boiler in Deven (BG), by firing coal with a lower sulfur content and equipped with a desulfurisation system using the injection of finely divided limestone.

### Nitrogen oxides (NO<sub>x</sub>)

Compared to 2006, the efforts of the Group resulted in a NO<sub>x</sub> reduction by over 50%.

In 2011, the global NO<sub>x</sub> emissions of the Group were reduced by an additional 1 000 t or around 10%. The improvement obtained last year is due to the adjustment of operational conditions on some boilers and, for other boilers, to the use of measured NO<sub>x</sub> data instead of emission factors.

### Heavy metals

Compared to the reference year 2006, the reduction of heavy metals emissions reached 10%.

These emissions in gaseous effluents are mainly due to emissions with dust from coal-fired power plants. Variations between years is explained by their amount in coal but also to more extensive analysis of their metal content in the last years, resulting in higher quantities reported.

Reductions are obtained through a program to install more dust filters (a.o. electrofilters) on power generators for a better abatement of fly ash and their metal content and by shifting to gas as energy source.

### Volatile Inorganic Compounds (VIC)

Compared to 2006, the VIC emissions were reduced by 9%.

Emissions of chlorine or fluorine do not occur under normal operation of Solvay installations. Even if traces of HCl and HF are being emitted from thermal oxidation units, 98% of the volatile inorganic emissions are ammonia releases from the soda-ash plants.

The ammonia releases will further be reduced in the future by important investment plans in several soda-ash plants.

Ammonia emissions are integrated into the eutrophication and the acidification impact indicators and into the Global Air Emission Index.

### Non-Methanic Volatile Organic Compounds (NMVOC)

Compared to the reference year 2006, the reduction achieved in 2011 amounts to 12%.

In 2011, the NMVOC emissions of the Group amounted to 4.18 kt, which is a reduction of almost 20% as compared to 2010.

### Dust

Compared to 2006, the dust emissions were reduced by a factor 7.

Compared to 2010, the dust emissions of the Group decreased by an additional 8%.

The dust emissions of the Group are mainly associated with the combustion of coal in the boilers used to produce steam and electricity.

As coal fired boilers are progressively replaced by gas fired boilers and/or equipped with dust abatement systems (electrofilters...), the Group will achieve further significant reduction of these emissions.

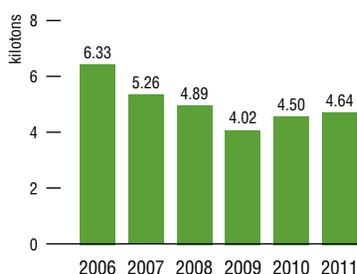


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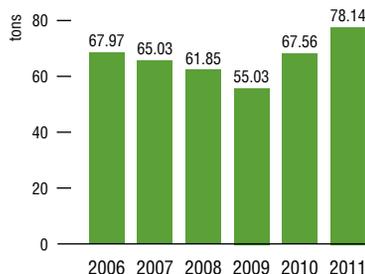


### 3.4.5. Emissions to water - Additional specific parameters (GRI EN21)

#### Chemical oxygen demand (COD)



#### Heavy metals



The variations in emissions of heavy metals in water effluents are mainly due to variations in their content in the natural limestone used as raw material for the soda ash production.

Perimeter: equivalent to manufacturing perimeter under operational control.

## 3.5. Waste

For its waste management, Solvay distinguishes industrial waste and waste – inert for the most part – stemming from its mining activities (limestone, salt, fluorspath, etc.).

The Group makes every effort to reduce industrial waste and in particular dangerous or potentially dangerous waste, with as a policy to reduce them to a minimum with a zero objective in the longer run. This will be further pursued via recovery, recycling, and heat recovery. For waste streams handled by third parties, the Solvay's policy is to contract only with registered and specialized waste management companies.

In many productions, such as in PVC processes, many hazardous waste are already recovered and recycled, either by recycling or by thermal destruction in high performance industrial incinerators, often operated on-site.

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### 3.5.1. Waste (GRI EN22)

Hazardous & non-hazardous waste

	2007	2008	2009	2010	2011
<b>Hazardous waste landfilled - Kilotons</b>	13	12.3	8	10.7	13.9
from which hazardous waste from construction and demolition, household and mining - Kilotons	-	-	-	-	0.9
<b>Hazardous waste recycled and recovered (60% by Solvay) - Kilotons</b>	153	133	102	132	76.4 <sup>(4)</sup>
from which hazardous waste from construction & demolition and household - Kilotons	-	-	-	-	2.9
<b>Hazardous waste incinerated with heat recovery - Kilotons</b>	48.3	42.3	50.6	45.5	11 <sup>(5)</sup>
from which hazardous waste from construction & demolition - Kilotons	-	-	-	-	0.2
<b>Non hazardous waste (excluding mining) landfilled - Kilotons</b>	1 424	1 315	1 152	1 083	1 340
from which construction & demolition non hazardous waste landfilled - Kilotons	(1)	(1)	(1)	(1)	27
<b>Non hazardous mining waste recovered by Solvay - Kilotons</b>	325	324	302	318	299
<b>Non hazardous mining waste pre-treated and landfilled by Solvay<sup>(2)</sup> - Kilotons</b>	1 703	1 745	1 600	1 876	3 087 <sup>(3)</sup>



<sup>(1)</sup> Construction & demolition waste are included in non-hazardous waste.

<sup>(2)</sup> Considering effective landfill and pre-treatment (PCT = Tailing ponds).

<sup>(3)</sup> Otjiwarongo reports 1 528 kt in 2011, compared to 342 kt in 2010.

<sup>(4)</sup> In 2011, the recycling/recovery data does not count anymore the recycling of material in the same process with the same function (e.g. MCB loop).

<sup>(5)</sup> Incineration in high performance incinerators with material recovery (HCl, HF,...) is now counted as "recovery".

*Perimeter: equivalent to manufacturing perimeter under operational control.*

*Comparisons with Solvay 2010 data are not directly possible. In 2011, the waste reporting of the Solvay group has been aligned on the EU Directive 2008/98/EC and on the Eurostat Manual on Waste Statistics-2010. Total waste is now divided into four categories; i.e. industrial waste, construction and demolition waste, mining waste, and domestic waste. The quantity of total hazardous and non-hazardous waste reported by the Group over 2011 corresponds to the industrial waste only. Regarding the hazardous waste, until 2010, internal recycling ( $\pm 130\,000$  t/y) was overestimated considering that the largest part ( $\pm 70\,000$  t/y) is actually directly re-used as such in the process. The hazardous reported waste are classified as such by national legislations. Due to frequent changes in the classification of waste, in particular for hazardous waste, in some countries the figures of declared waste quantities may appear to increase and why it is not always meaningful to reconstruct figures for the past years on the basis of the changed definitions.*

**To reduce solid and liquid waste generation and reduce final, non-recyclable hazardous waste to a minimum, promoting reuse, recycling, and energy recovery. To better close loops in integrated industrial platforms and via partnerships.**

**Most hazardous waste (86% of the total) is now recycled and recovered (most often internally by Solvay) or destroyed via incineration with heat recovery. By comparison, the landfilled part**

**of hazardous waste represents only 14%. The largest part of non-hazardous waste (around 2 000 kt/y) is originating from mining activities on three sites: Green River (USA), Otjiwarongo (NA), Escuzar (MX).**

The increase in the total of non-hazardous waste is due to an increase in the quantities reported by the Otjiwarongo mine (1 528 kt in 2011, compared to 342 kt in 2010), as consequence of the new reporting format for mining waste.

An increasing part of waste is handled by large specialized waste management companies that offer high efficiency service, especially for the treatment of ultimate hazardous waste.

The non-hazardous waste excluding the mining waste (1 340 kt in 2011) is slightly reduced from 2007 (estimate 1 424 kt).

#### Waste recovery and recycling

Globally 33 sites are recycling significant volumes of waste (86% of the hazardous waste) on-site, by incineration with energy recovery or by material recovery.

#### Organic chlorinated and fluorinated waste

These are managed internally and thermally destroyed on site in installations with very high environmental performance specifications, most of them recycling the fluorine or chlorine content as secondary raw material. Three units can also manage post-use (chloro) fluorocarbon products and SF<sub>6</sub> recovered from customers. Policies are promoting the development of collection schemes (SF<sub>6</sub>)

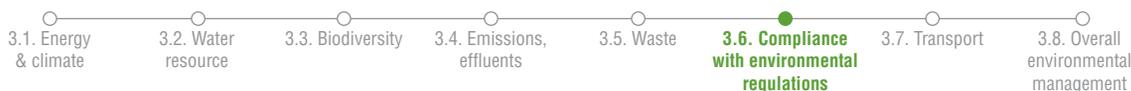
See 6.2.1. Product recycling - An evaluation for Solvay key products, on pp. 81-82.

#### Waste from soda ash production

Concerning non-hazardous waste, soda ash manufacturing in particular (representing almost five million t/y soda ash manufactured in Europe) generates large quantities of non-hazardous mineral inert waste.

Quantities and composition of these solid waste materials, mainly sands and clays depend on the composition and type of the limestone (CaCO<sub>3</sub>) used. Non transformed CaCO<sub>3</sub> can also be present as well as some additional lower quantities of calcium sulfate (CaSO<sub>4</sub>). Their volumes cannot be reduced but, adequately managed, these materials do not represent an environmental or health risk. The areas near the manufacturing sites where these by-products are stored are progressively rehabilitated with adapted plant species fitted to calcareous soil.

See 3.3.1. Natural areas & land rehabilitation, on p. 36.



## 3.6. Compliance with environmental regulations

Each manufacturing site checks its compliance with all local applicable environmental regulations, in particular with the operation permits. The Environment Management Systems (EMS) include procedures dedicated to check this compliance.

Environmental infringements to permits are defined locally, in each individual operating permit. Thus, the definition of infringements to be declared may vary from site to site.

### 3.6.1. Environmental infringements (GRI EN28)

	2010	2011
"Environmental agency reportables" infringements reported to authorities <sup>(*)</sup>	192	268

<sup>(\*)</sup> Cases reported to authorities in the framework of permits in all sites: Environmental Agency Reportables (EAR's) are events that require a written report of the plant management to their local environmental authorities. The most common types of Environmental Agency Reportables typically include (although requirements may differ by country).

*Perimeter: equivalent to manufacturing perimeter under operational control.*

- Exceeding to the permit (emissions to all media: air, water, soil) that must be reported in writing to authorities: emissions above numerical limits on a mass (g/h, kg/year) or concentration (mg/l, mg/Nm<sub>3</sub>) basis;
- Violation of an environmental operational requirement (e.g. minimal stream factor of an incinerator, an electro filter...);
- Release of a regulated substance to the environment that exceeds a local, state or federal minimal reportable quantity;
- Significant hazardous waste manifest discrepancy (e.g. a corrosive liquid is listed on the manifest, but a flammable liquid is shipped);
- Failure to conduct environmental analysis or tests permit required by permits.

*Liability declaration from the authorities ("notice of violation").*

**To comply with all applicable laws and regulations and with voluntary Solvay's commitments that go beyond applicable laws and regulations, and to systematically monitor environmental performance and correct detected non-compliance.**

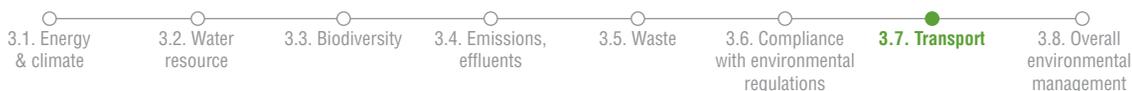
**Infringements are defined in the framework of permits in all sites. Many reported infringements are of administrative nature with no direct environmental significance or consequence ("agency reportable infringements").**

This indicator has been introduced in 2010 in the public environmental reporting of the Group.

The increase in number observed in 2011 is due to improved reporting following updated reporting instructions given to the sites as a consequence of the external review of the overall environmental reporting process performed by Ernst and Young (E&Y) last year.

The detection and follow-up of environmental non-compliance is an intrinsic part of environmental management systems.

See 3.8.1. Environmental management system, on p. 47.

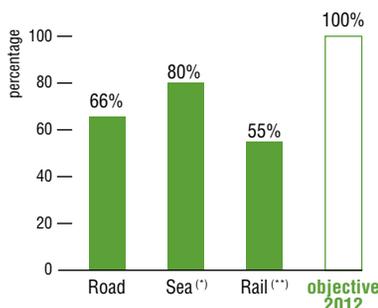


## 3.7. Transport

Safe transport is a key aspect of product stewardship, in particular for dangerous goods that involve potential risks for human health and the environment. Safety measures for transport start off from the loading of the products. Most of the transport of raw materials and end products is contracted out. Key safety elements taken into account are the selection of transporters and transport routes (road - sea - air) and the prevention, and when occurring, monitoring of accidents in order to take appropriate corrective measures. Solvay is member of a worldwide service which can give immediate support to mitigate the potential consequences of an emergency during the transport and use of its products.

### 3.7.1. Transport of dangerous goods - Safety verification

Selection / safety verification of logistics service providers for Solvay dangerous products - Transporters & storages (World - assessment), 2011



(\*) Sea: bulk transport of liquid and gaseous dangerous products.

(\*\*) Rail: for rail transport, Solvay has to rely on the railway companies which manage their own safety systems and verification.

*Perimeter: equivalent to manufacturing perimeter under operational control.*

*Percentage of logistics service providers for dangerous products that have undergone selection / verification process in line with the Group's requirements.*

*The figures represent an assessment of the logistics services that undergo an efficient selection process, including safety verification. Various systems exist in the different regions.*

**To select logistics suppliers using recognized selection and audit systems to 100% of providers of logistical services for dangerous goods by 2012, and to achieve zero transport incident with potential impact on people and the environment.**

**Most of the transport of raw materials and end products is subcontracted. Solvay has systems to select transporters for road, sea, and rail transport. The program to ensure selection and audit systems for all transporters of dangerous products worldwide is well-advanced.**

Suppliers of logistics services, in particular transporters, are a key actor to build safe value chains. To assess the performance of transporters and other logistics services providers, Solvay performs surveys or relies on existing recognized systems such as the European Safety Quality Assessment System (SQAS), the Chemical Distribution Institute (CDI), the Health, Safety, Environment, and Quality assessment systems of the Brazilian Association of Chemical Industry (SASSMAQ), the Road Safety Quality Assessment Safety (RSQAS) for the road transport in China or the European Barge Inspection Scheme (EBIS) schemes.

#### Road

The schemes constitute the basis to decide which providers to select. Assessments are organized on a global scale for the large majority of road transporters.

#### Sea

For sea transport, worldwide, all bulk transporters of liquid or gaseous dangerous products are audited via the CDI system. For dry products and containers' shipments, Solvay relies on the Port State Control (PSC) system, avoiding ships that have been detained in the past three years.

#### Rail

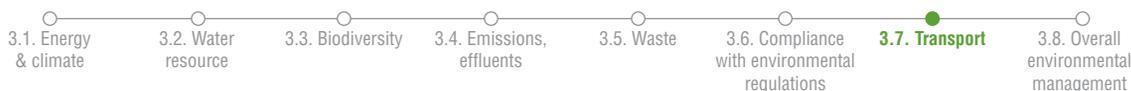
For rail transport, Solvay has to rely on the railway companies which have their own safety management systems and audits.

#### Carechem

Solvay adheres to a worldwide service Carechem24 (and Chemtrek in the US) – usable from any country – providing phone assistance in the local language via a call center mentioned in the safety documents in the event of an accident or any other incident during the transport of its products.

#### Other suppliers

The relationship with suppliers is also governed by Solvay's Code of Conduct for suppliers. Work is under way to better assess and guarantee the non-financial performance of suppliers. A tool has been developed to assess the risks associated with unsustainable suppliers. Solvay is also part of a German workgroup on suppliers and how to select them as regards societal.



### 3.7.2. Accidents during transportation (GRI EN29)

Accidents & incidents during transport, loading, and unloading of Solvay products

	2010	2011
Significant	10	1
Serious	1	5
<b>Total</b>	<b>11</b>	<b>6</b>

Perimeter: equivalent to manufacturing perimeter under operational control.

The reported events are the incidents that occurred at Solvay premises or those that have been reported by transporters and third parties to Solvay. Criteria for classifying accidents are the following:

Significant

Minor injury / Evacuation of employees / Alteration of secondary transportation infrastructure or of area within an industrial plant / Release of hazardous material quantity greater or equal to 450 l or 400 kg or resulting in a potential risk of environmental damage.

Serious

Fatality / Major injury / Intensive medical treatment / Evacuation of any number of general public / Alteration of a major transportation infrastructure (road/rail/airport/...) / Release of hazardous material quantity greater or equal to 1 cubic meter or 1 000 kg, or resulting in a potential risk of fire or injury.

**To achieve zero transport incident with potential impact on people and the environment.**

**There have been five serious accidents (two of them with human consequences) and one significant accident associated to transport, loading, and unloading of Solvay's products in 2011.**

Serious accidents

**Transport - Germany**

- A car hit the back of a truck transporting liquid NaOH. The driver of the car died in the collision - Tank damaged and spillage of 440 kg of NaOH.
- Containers of PVC pellets involved in a train derailment. Spilled PVC cleaned up and put into 40 big bags - No injured, traffic blocked for a short period of time.
- A truck of NaOH was involved in a traffic accident on a highway. Spillage of 500 kg NaOH - Transport unit has been completely destroyed - Closure of the highway.

**Loading - Belgium**

- A driver has been burned to a third-degree by caustic soda, still present in the loading arm and projected on his foot by a strong wind.

**Transport - Thailand**

- Fall of five IBCs of 50% H<sub>2</sub>O<sub>2</sub> from a truck. The spilt quantity of H<sub>2</sub>O<sub>2</sub> has been diluted in the water. Closing of the street. No harm to human/ environment.

Significant accident

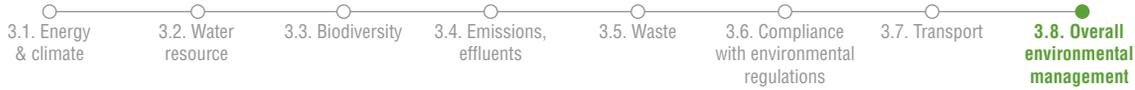
**Unloading - Netherlands**

- Splashing of caustic soda into the eyes of an operator on a customer site during the degassing of a tank directly to the air.

Programs have been carried out and are under way to further improve transport safety, notably through the implementation of the Cefic's guidelines on best practices in transport and logistics operations, in dialogue with the logistic service providers.

In order to prevent accidents and mitigate the consequences of possible accidents, operational entities:

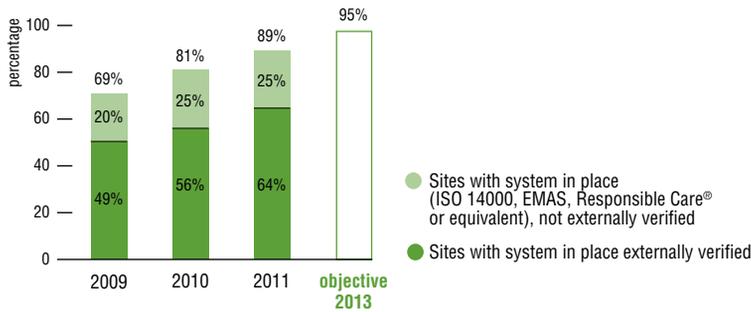
- Develop and apply specific technical standards for the transport of products presenting specific risks;
- Establish procedures for the selection and use of transport units, containers and packaging that are appropriate for the transported product, in compliance with testing and certification requirements, and free of leaks or any other visible defect;
- Develop and support product stewardship programs to ensure the safe manufacture, distribution, use, and disposal of dangerous products;
- Ensure a worldwide phone emergency assistance in case of accident during the transport and use of dangerous products wherever they take place.



## 3.8. Overall environmental management

Solvay applies recognized Environmental Management Systems (EMS) that are based on the principle of continuous performances improvement. These systems are the basis for the deployment of key elements which include risk analysis, monitoring of environmental performance and compliance to regulations and permits, follow-up of the corresponding corrective actions, review of performance and improvement plans by the management.

### 3.8.1. Environmental management systems



Perimeter: equivalent to manufacturing perimeter under operational control.

**By 2013, to establish certified environmental management systems (EMS) of ISO 14001-type or equivalent at all sites where there is a significant risk of adverse environmental effects.**

**The deployment of Environmental Management Systems (EMS) is about to be fully deployed.**

The general policy is that all manufacturing sites implement a management system for environment (ISO 14001 or equivalent in line with the Solvay standards for

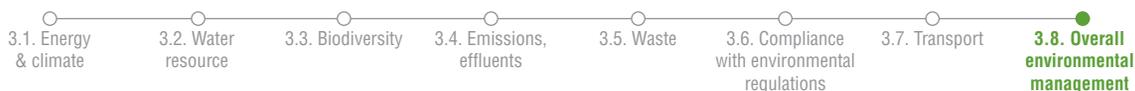
such system) and obtain external certification. Externally verified EMS are implemented in 64% of manufacturing sites, while an additional 25% do have an EMS without external verification. It is expected to achieve a target of 69 sites out of 73 with an EMS by 2013, meaning 95% of production sites with an EMS.

Environmental management systems generally used in Europe are of the ISO 14000-type, and comparable management systems elsewhere. In the US and in Argentina, for example,

the management systems generally stem from the national Responsible Care® programs. The breakdown by EMS type is:

- ISO 14001: 66%
- Eco-Management and Audit Scheme (EMAS): 2%
- Other (mainly Responsible Care®): 32%

These systems include provisions for the verification of compliance with laws and for performance documentation.



### 3.8.2. Best Available Techniques & improvement programs (GRI EN18)

Worldwide benchmark with environmental requirements of the European Union Best Available Techniques (BATs)

	2010 - 2011
Number of assessments	500

*Perimeter: equivalent to manufacturing perimeter under operational control.  
Assessment covers all manufacturing processes covered by a vertical and/or horizontal BATs.*

**To bring all manufacturing units worldwide up to the environmental performance of the best by aligning with Best Available Techniques (BATs) by 2020.**

**To benchmark all plants with BATs.**

**All sites regularly carry out management reviews of environmental performance and compliance.**

The program to benchmark all manufacturing plants worldwide to the environmental requirements of Best Available Techniques (BATs) is completed, with more than 500 assessments carried out in 2010-2011 (benchmark with horizontal and vertical Best Reference documents BREFS). This is a strong lever to further align environmental performance worldwide for all similar manufacturing units.

In the framework of excellence in manufacturing, environmental programs in sites focus in particular on (1) emission control and reduction, (2) compliance to environmental quality standards, (3) checking compliance and

seeking alignment with BATs, (4) immissions<sup>(\*)</sup> assessment programs, (5) environmental liability insurance, and (6) business-specific voluntary commitments.

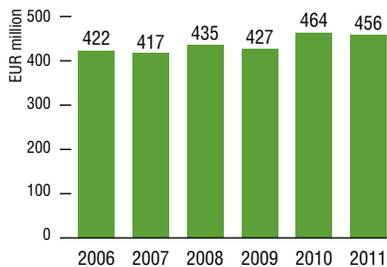
<sup>(\*)</sup> Immission: concentration of pollutants in the environment resulting from emissions of pollutants, after dispersion and possible chemical transformation of these pollutants in the receiving media; immission measurement evaluates the quality of the media and is representative of the impact on the environment and individuals.

#### Environmental Quality Standards (EQS) and overall impact reduction

The objective of environmental plans is to protect the environment, complying with EQS for the surrounding environment and with the environmental permits. Further to that, overall reduction objective of 20% by 2020, as compared to 2006 both for the emissions to water and for the emissions to air, is pursued.

The environmental improvement plans relate in particular to further control of the emissions of priority substances in terms of potential adverse environmental impact.

### 3.8.3. Health, safety, environment provisions (GRI 1.2)



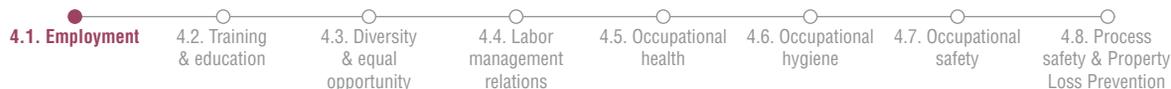
*Perimeter: whole Solvay group.  
The provisions are reviewed on the basis of the IFRS norms. The events which might potentially take place after 20 years are not taken into account.  
More details on the economic performance of the Solvay group are to be found in the Annual Report.  
The figures are reviewed by Deloitte within the global financial audit.*

**The stability over time of the financial provisions for health, safety, and environmental risks reflects the rigorous policy and the long term risk management of such threats.**

The global financial risk associated to health, safety, and environmental risks is managed along three lines: the insurance program, the financial provisions, and the Group risk engineering program.

The risk engineering and asset protection action plan is led by the

Group Risk Management team. By 2014, all Solvay's plants should be designated as Highly Protected Risk (HPR) by its insurer FM Global. 20 sites are identified as presenting the highest maximum foreseeable loss in case of accidents.



# 4. Human resources & labor practices



## 4.1. Employment

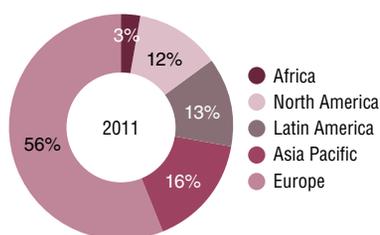
As part of an extensive restructuring of its Human Resources (HR) function, the Solvay group has put in place global HR processes which feed a worldwide integrated HR database. This database:

- Respects the privacy of personnel data;
- Is for the most part fully operational in all entities, including the joint ventures, where Solvay has a majority shareholding in Europe, Nafta, and Mercosur, with some exceptions; a number of entities are not covered yet in the consolidation of the data in Eastern & Northern Europe. In Asia and Africa, blue collars are generally not included (except for headcount where data is available).

This explains the scope of a certain number of parameters will vary in the following HR chapters: 4.1. to 4.4.

### 4.1.1. Employment by region (GRI LA1)

Full time equivalent, including Rhodia in 2011



	2010	2011
Africa	928	908
North America	1 931	3 389
Latin America	1 091	3 797
Asia Pacific	1 090	4 596
Europe	11 746	16 432
<b>Total</b>	<b>16 786</b>	<b>29 122</b>

Perimeter: whole Solvay group, including Rhodia, the new sector of the Group since September 2011.

**The Group's efforts aim at a major objective, the creation of the new Solvay built for geographic expansion and focused on Sustainable development.**

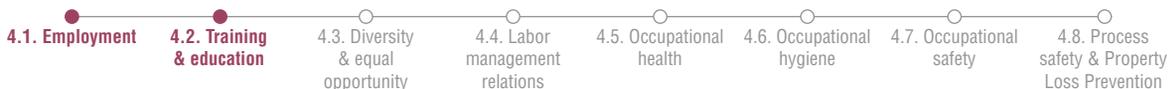
**The Solvay group, including Rhodia, headquartered in Brussels, employed by end 2011 29 122 people in 55 countries. The distribution chart shows that above 40% of Solvay employees are based outside of Europe including around 4 500 in Asia Pacific.**

The Group's strategy aims at concentrating its deployment on a limited number of strategic chemicals and plastics projects, directed primarily at geographic expansion outside Europe in order to reinforce

its presence in the emerging markets. The acquisition of Rhodia reflects the deployment of this strategy. The Asian population of Solvay has almost tripled in the past year, from 6% to 16%. The proportion of employees in Mercosur has nearly doubled, from 7% to 13%.

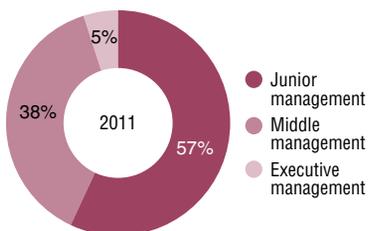
Along the same line, Solvay implemented new Research & Technology centers in Asia (India, Korea, and China) two years ago, in order to strengthen its presence in this growing region.

See 5.2.2. R&D staff, on p. 71.



### 4.1.2. Distribution of managerial personnel by hierarchical level (GRI LA13)

Managers by job class (Hay system), not covering Rhodia



	2010	2011
Junior management	1 835	2 201
Middle management	1 332	1 452
Executive management	194	196
<b>Total</b>	<b>3 361</b>	<b>3 849</b>

Perimeter: consolidated companies of the Group in Europe, Nafta, Mercosur, Asia Pacific, and Egypt. Rest of Africa is not covered. The managerial personnel of Rhodia is not included.

The increase of headcount in 2011 is due to the inclusion of managers from Asia Pacific.

**To ensure that all Solvay's employees understand their roles and responsibilities in their current function while getting visibility on what is required to progress in their career.**

**To make use of the job families throughout the Group.**

**To support its ambition to become global, the Solvay group has overtime introduced Group organization design related tools to measure and compare jobs, both internally and externally, on a worldwide basis.**

Within the Solvay Human Resources (HR) management framework, Job families are an important "building block". These Job families provide valuable references used directly or indirectly in Workforce Planning, Staffing, Career Management,

International Mobility, Performance Management, Reward process, Payroll and Data Management. This approach is an essential step in Solvay's efforts to have a clear and open HR process aligned with businesses, organizational processes and needs. The methodology uses objective criteria to develop the outputs (including job descriptions) and measure consistency across professions within the Group (functions, business...). Each job family model follows a standard format and identifies:

- A mission;
- Key responsibilities;
- Expertise requirements;
- Competencies requirement;
- A career ladder with associated key differentiators.

## 4.2. Training & education

### 4.2.1. Learning & development (GRI LA10)

Managerial population

	2009	2010	2011
Number of managers trained	6 220	3 429	4 114
Number of training sessions organized	19 483	12 862	16 460
Average number of training sessions per manager	3.1	3.8	4

Perimeter: Europe, Nafta, and Mercosur managerial population, and a part of the Asian managerial population which joined the global deployment of the Technology & Development activities mid-2011.

For more details on training the Solvay legal affairs & compliance department, see 1.2.1. Compliance with the Code of Conduct, on p. 23.

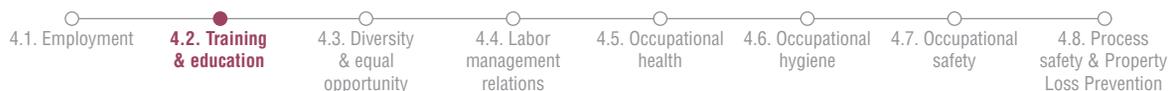
**All employees in all locations to be provided opportunities to develop their expertise, competencies, and experience to fulfill the Group's long-term talent requirements and to maintain their employability.**

**To strenghten the employee training and development programs.**

**Solvay has made a significant investment in learning and personnel development initiatives. In particular, the Solvay Corporate University (SCU) is continuously expanding its curriculum. All managers of Solvay companies are enrolled to participate in the SCU program.**

The curriculum of the SCU reflects the qualitative requirements of the Group as defined by its strategic learning plans. Also, the IT system put in place is progressively capturing and measuring the trainings that have been given to the managerial population.





**For non managerial staff, most trainings take place in manufacturing sites and is not consolidated yet at the Group level, especially the safety and technical trainings.**

At the level of the Group (Asia excluded), it is estimated that in 2011 employees (exempts and non-exempts) have received on average 27 hours of training.

A project has been launched to enable a better follow-up of all kind of learning & development actions for all Solvay employees at the end of 2012.

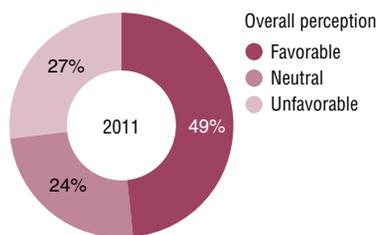
**Change Leadership Model (CLM)**

In 2011, the CLM that supports the transformation of the Solvay group has been embedded in the main development activities. This International Management Seminar (IMS) takes place every year, involving 60 young managers and focusing on the key Group challenges every year. CLM is currently the main topic of the IMS.

The seminar links leadership to the reality of Solvay's activities and to the constraints and opportunities they present. Also, the Management Development Series workshops which are mandatory for all new managers in the Group have been deployed in Asia with success.

**4.2.2. Personal development**

Perception - Solvay People Surveys



	Favorable			Neutral			Unfavorable		
	2006	2009	2011	2006	2009	2011	2006	2009	2011
"Opportunity for personal development and growth in Company"	55%	58%	53%	22%	22%	23%	24%	20%	24%
"Sufficient opportunities to receive cross-training to learn other jobs"	41%	43%	41%	26%	27%	26%	33%	30%	30%
<b>Overall perception</b>	<b>48%</b>	<b>51%</b>	<b>49%</b>	<b>24%</b>	<b>24%</b>	<b>24%</b>	<b>28%</b>	<b>25%</b>	<b>27%</b>

Perimeter: whole Solvay group.

Opinions of personnel about personnel development and cross-training possibilities in Solvay People Survey 2006 (78% of staff), 2009 (86% of staff), and 2011 (85% of staff).

**To have a worldwide mapping of quantitative and qualitative staffing requirements reflecting the Group's strategy and to be able to meet these needs on a sustainable basis. The Group strategy is: "to Grow our People to Grow our Group".**

**To identify staff skills and abilities, and the forecasted needs.**

**The results of the last Solvay People Survey (2011) show that the perception about personnel development and cross-training is moderately favorable and relatively stable over the last years.**

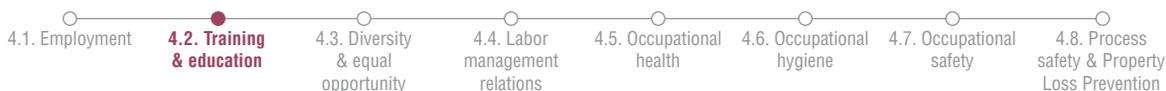
To improve the situation, Solvay has launched a new process to foster development plans. The Individual Development Plan (IDP) is a process, supported by a worldwide information tool, to identify areas to be developed in current or future functions. Output is the creation of realistic and measurable actions with a very pragmatic approach.

For instance, managers and employees can use a guide that illustrates how to develop the competencies included in the Solvay Competency Dictionary.

The learning actions identified will

be deployed through the Solvay Corporate University (SCU).

The SCU, created in 2007, is aimed at providing the abilities to develop supervisory careers, for example in the management of teams and people from a variety of cultural backgrounds. Course and program offerings help people to enhance their effectiveness and strengthen their leadership contributions at Solvay. Around 200 managers take part every year in such seminars. As a virtual university, SCU can respond to local and global needs quickly with skilled facilitators who offer courses in or near Solvay's many facilities.



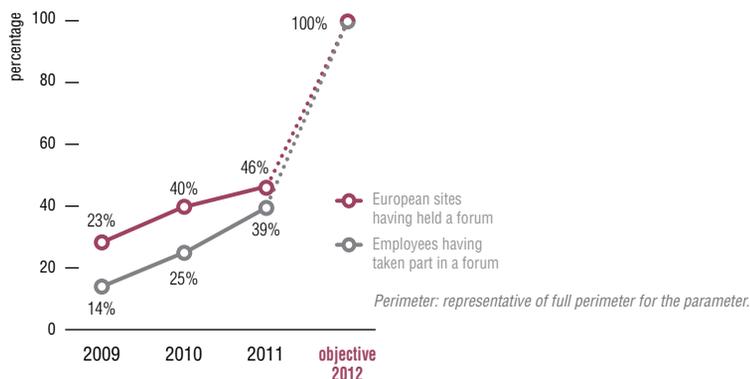
### 4.2.3. Sustainable development in training paths

Sustainability forums & Solvay Corporate University (SCU)

**To include Sustainable development in the training of employees at all levels and organize a forum on Sustainable development in each site as agreed with Solvay's European Works Council (EWC), by 2012.**

**Sustainable development awareness and learning are increasingly included in all standard learning paths. Two key channels are: the Solvay Corporate University (SCU) learning path for managerial population organized at central level, and the forums on Sustainable development to be deployed in all sites.**

#### Cross-hierarchical forums on Sustainable development



**Close to 50% of sites have a forum initiative, bringing together employees and managerial staff. These forums are a source of commitment, of dialogue and of proposals for further progress.**

The aim of these decentralized forums is to raise awareness and “seeds for growth” for sustainability and societal thinking among employees, providing support to the Sustainable development projects of

each site. The aim is to organize a forum on Sustainable development in each site as agreed with Solvay's European Works Council (EWC), by 2012. These forums allow sharing among people at different levels in the site as well as creating a common vision of sustainability challenges and objectives. They encourage awareness and constitute “seeds for growth” for the Company's sustainability mindset.

#### Solvay Corporate University (SCU)

	2009	2010	2011
Managerial population participation in Solvay Corporate University paths with significant sustainability content	± 200	± 200	± 200

In 2011, Corporate seminars have been held for middle management and executives: the International Management Seminar (IMS) and the action learning seminar (Pinnacle) both had a significant sustainability

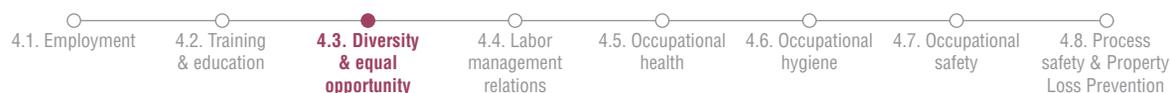
component. From 2012, every hired managers will follow a mandatory training on the theme of Sustainable development, and how it is deployed within Solvay.

Solvay's European Works Council, a partner since 2002 of the Group's sustainability initiatives, has played a decisive role in the development of a strategic approach on sustainability issues. In 2011, health and well-being at work, diversity, employability, and demography of the personnel have been examined. A large seminar dedicated to demographics was held with a large representation of the personnel. Among the key conclusions: the significance of this emerging issue and of workforce planning, especially in Europe, no benefits-all solutions envisaged, and the need to tackle this issue in a systematic and structured way.

#### The International Management Seminar (IMS)

Sustainability has recurrently been a key dimension in management seminars in the last three years. For example, the 2011 IMS seminar was built on ten working groups, around themes mainly focused on sustainability:

- Build trust on your entity activities;
- Open innovation;
- Invest in the future green chemical industry;
- Sustainable development: a must for the Vinyls;
- Towards the “zero accident”;
- Maintaining manufacturing excellence in a fast-changing workforce environment;
- 20% decrease of CO<sub>2</sub> emissions in the Solvay's supply chains by 2020;
- Solvay Pharmaceutical Sustainable development (Sustainability) and Corporate Social Responsibility (CSR);
- Market Pull Strategy: “Are we listening to the markets?”



## 4.3. Diversity & equal opportunity

### 4.3.1. Diversity & equal opportunity (GRI LA13)

Gender, Hay system/job families, age, international mobility

#### Gender

Women & men repartition

	2009		2010		2011	
	Women	Men	Women	Men	Women	Men
In all personnel	17%	83%	17%	83%	17%	83%
In management	22%	78%	22%	78%	23%	77%

*Perimeter: Europe, Nafta, and Mercosur. The average proportion of 17% of female employees hides significant variations per functional domains.*

 **To encourage diversity among employees, to reinforce Solvay's multinational, multicultural, and multidisciplinary composition.**

**In functional support areas (like Human Resources (HR), Finance, Communication, Innovation center, Research & Technology), female workers represent 46% of the total headcount.**

The Group recruits and selects staff without any form of discrimination on the basis of job requirements (expertise and competencies) and the capability and willingness of candidates to adopt the underlying Group's Values.

The Company non-discrimination policy prohibits discrimination on the basis of gender, race, age, religion, nationality, and opinions. This policy applies globally and is imbedded in the Solvay's Code of Conduct.

Equal opportunity - Women in management by job class (Hay system)

	2010		2011	
	Count	Percentage	Count	Percentage
Junior management	526	28.7%	619	28.2%
Middle management	213	16.0%	248	16.9%
Executive management	14	7.2%	13	7.0%
<b>Total women in management</b>	<b>753</b>	<b>22.4%</b>	<b>880</b>	<b>22.8%</b>

*Perimeter: Europe, Nafta, and Mercosur. For the global distribution of managerial personnel (women and men).*

**Female employees represent 23% of the managerial positions. At the executive level, the percentage is 7%.** The ways to compensate these unbalances were further studied in 2011. Within the Horizon project<sup>(1)</sup> some HR policies are rewritten. Among other initiatives, female managers attended a workshop at IMD leadership to explore ways to enhance women presence at the executive level.

<sup>(1)</sup> The aim of the Horizon project (in place since April 2011) is to reorganize the Group, as part of the strategy to make the Group a major player in sustainable chemistry.



**Equal opportunities - Hay system**

**The Solvay system of job classification is based on the Hay system of job evaluation. By end 2010, the Hay system coverage for this population reached 86%.**

A compensation system (a corridor of 85-120% for remuneration within a given Hay class) ensures salary fairness amongst employees within the Company, and competitiveness and fairness vis-à-vis the external work market.

Since 2003, global “job families” have progressively been defined and introduced for the whole managerial population.

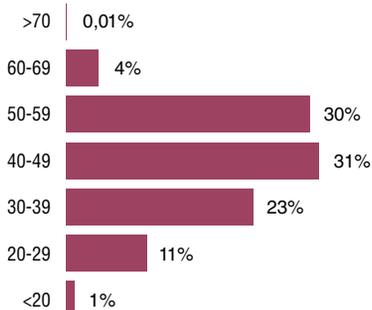
The *job families* (see 4.1.2. Distribution of managerial personnel by hierarchical level, on p. 50) apply worldwide, providing standardized information about key responsibilities, competencies, and expertise required for each type of job. Each job family is associated to career ladders, with

key differentiators. Each step on a career ladder is calibrated with the international Hay system of job evaluation.

Job families and their career ladders are accessible to common employees and management alike, ensuring significant transparency for all concerned. They are used – among others – during the promotion process.

**Age pyramid**

Solvay population, 2011



*Perimeter: all entities, including the joint ventures, where Solvay has a majority shareholding in Europe, Nafta, and Mercosur, with some exceptions. A number of entities are not covered yet in the consolidation of the data in Eastern & Northern Europe. In Asia and Africa, blue collars are generally not included (except for headcount where data is available).*

**Demographic evolution of Solvay employees is a topic of concern.**

In 2011, a specific initiative was launched with the European Works Council (EWC). For two days, managers and members of the EWC have been discussing current trends and ways to improve. Recommendations discussed with the CEO included:

- Improve work-life balance;
- Adjust (ergonomic) working conditions;

- Implement strategic learning plans at site level;
- Foster mobility (geographic and functional) with dedicated learning opportunities;
- Increase young talent attraction (partnership with schools and image of the Company in the market).

**Employee mobility - International mobility**

Number of moves per year (Management only)

	2010	2011
Chemical sector	95	95
Plastics sector	65	76
Functions	107	118
<b>Total</b>	<b>267</b>	<b>289</b>
<b>Ratio</b>	<b>6%</b>	<b>8%</b>

*The ratio of 8% is measured against the estimated total number of managerial population in the Group.*

**The Group’s strategy is to ensure that employees develop their skills and move across functions and countries in order to avoid the creation of geographical and/or business silos.**

Such moves are based on a variety of elements such as the competencies and the expertise of the person, his/her specific aspirations and the Company’s needs. More than 90% of international moves are long term (i.e. three to five years).

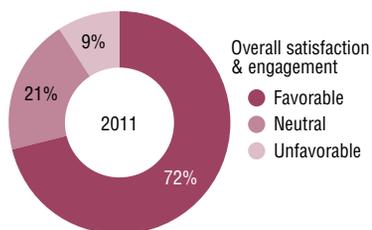


## 4.4. Labor management relations



### 4.4.1. Satisfaction & engagement of personnel

Perception - Solvay People Surveys



**To evaluate and improve the satisfaction and engagement of its personnel, the Solvay group carries out a survey every two years.**

The overall engagement results have been slightly eroded as compared to the last survey. This can be a consequence of the Pharmaceuticals sector's sale and of the implementation of the Horizon project<sup>(1)</sup>.

<sup>(1)</sup> The aim of the Horizon project (in place since April 2011) is to reorganize the Group, as part of the strategy to make the Group a major player in sustainable chemistry.

	Favorable			Neutral			Unfavorable		
	2006	2009	2011	2006	2009	2011	2006	2009	2011
"I feel proud to work for my Company"	76%	79%	74%	19%	17%	21%	5%	4%	5%
"Job makes good use of my skills and abilities"	74%	75%	70%	15%	14%	17%	11%	11%	13%
"Overall, satisfied with the Solvay group as an employer"	74%	78%	72%	18%	16%	20%	7%	6%	8%
"Recommend my Company to others as a good place to work"	73%	78%	72%	19%	18%	20%	8%	7%	8%
<b>Overall satisfaction &amp; engagement</b>	<b>74%</b>	<b>77%</b>	<b>72%</b>	<b>18%</b>	<b>16%</b>	<b>21%</b>	<b>7%</b>	<b>7%</b>	<b>9%</b>

Perimeter: whole Solvay group.

Internal surveys are performed every 2 years to evaluate how employees consider various aspects of the Group's management. Overall satisfaction and engagement is analyzed through four main statements, covering: (1) pride for the Company, (2) good use of skills, (3) good employer, and (4) good place to work. About 85% of the personnel (86% in 2009, 78% in 2006) responded to the latest survey, which took place in 2011.



#### 4.4.2. Satisfaction & engagement - Key factors & corrective actions

Number of corrective actions following the survey - Solvay People Surveys

	Favorable			Corrective actions		
	2006	2009	2011	2006	2009	2011
Organizational effectiveness	77%	78%	75%	–	225	255
Communication	73%	77%	74%	–	341	225
Safety & responsibility	77%	77%	74%	–	136	139
Engagement	74%	77%	72%	–	26	30
Working relationships	71%	73%	71%	–	97	101
Immediate management	69%	71%	70%	–	169	135
Customer & quality focus	72%	74%	70%	–	73	67
Innovation	58%	61%	59%	–	195	150
Treatment & respect	60%	64%	59%	–	166	118
Performance review	53%	57%	53%	–	112	73
Leadership	50%	54%	51%	–	185	131
Training & development	52%	53%	51%	–	394	399
Reward, pay & benefit	47%	51%	47%	–	36	42
<b>Total</b>	–	–	–	<b>2 272</b>	<b>2 155</b>	<b>1 865</b>

Perimeter: whole Solvay group.

Internal surveys are performed every two years to evaluate how employees consider various aspects of the Group's management. About 85% of the personnel (86% in 2009, 78% in 2006) responded to the latest survey which took place in 2011.

#### To monitor the improvements dedicated on following the Solvay People Surveys.

**Detailed analysis of the survey shows that the favorable and unfavorable ratings may vary between entities/countries/regions. Results are discussed at the global level and with the personnel at the operational level, entity per entity. Following the surveys in 2006, 2009, and 2011, a series of action plans have been set up (in 2011, 1 865 actions in total).**

The aim is to take into account the aspects for which each entity recorded the most unfavorable scores. At the same time, the Human Resources function takes into account the overall results of the survey to initiate specific corrective actions on a global basis.



### 4.4.3. Performance & development appraisal (GRI LA12)

Solvay staff - Annual reviews

	2011
Europe	98%
Latin America	99%
USA	99%

*Perimeter: representative of full operational perimeter for managerial staff, and for non-managerial staff except for Asia PDAs of managerial staff only.*

*Rate of completion of e-PDA for managerial staff (as a percentage of the total managerial population representing around 25% of the overall population). This relates to performance and development reviews relative to the year 2011 and captured in the e-tool in early 2012. The perimeter includes Europe, Mercosur, and the US.*

**Solvay uses Performance Management to ensure that business objectives are cascaded down the organization and translated into measurable goals, hence aligning individual and team contributions to the Group's strategy. It also aims at developing the full potential of the employees to ensure the Group's long-term sustainability.**

**Performance Management is the link between the different aspects of people management, especially career and personal development, reward, mobility, and individual needs/preferences.**

**In 2011, Solvay designed new processes and tools to ensure that the Group has a competent, capable, and engaged workforce that delivers current business results and is prepared and ready to take on new challenges and opportunities in line with their aspirations.**

- "Performance appraisal"; to reflect how well employees have achieved the current job;
- "Career Development"; to look ahead at strengthening employees' performance in their current position as well as preparing them for the next steps in their career.

Solvay's managerial staff goes already through an annual and formalized Performance and Development Appraisal (PDA) review. A mid-year review is also included in the process.

For the Solvay's managerial population ( $\pm$  25% of the entire population of Solvay's employees), the annual PDA review is captured through an IT tool (e-PDA) which is completed by both the employee and the operational manager.

Performance appraisal also exists for non-managerial personnel. If local procedures are used, managers can also use the formalized Group PDA review system which is progressively used even though not yet systematically captured in the e-PDA system. The practice of an annual PDA is already comprehensive in the United States for non-managerial staff. In the other regions non-managerial staff PDAs are currently discussed with employee representatives on a site by site basis. In 2011, 1 252 non-managerial employees did their performance appraisal through the e-PDA system and the global completion rate reached 96%.



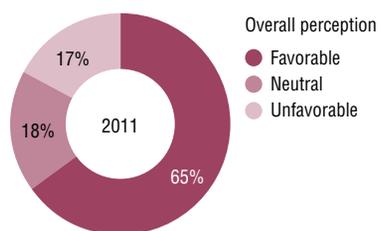
## 4.5. Occupational health

Solvay takes into account health of employees in the widest dimension, that is to say embracing a high degree of physical, mental, and social well-being. Health of employees today results in part from their past and present overall working conditions, in particular from occupational hygiene conditions.

To have a uniform, high level of occupational health worldwide, the Medexis project – MEDical EXposure Information System – has been initiated four years ago. Medexis is a key system which enables hygienists and occupational physicians in the Group all over the world to share common tools, standards, and progressively create a data bank of worker’s health status and exposures conditions during their career.

### 4.5.1. Personnel well-being & stress

Perception - Solvay People Surveys



	Favorable			Neutral			Unfavorable		
	2006	2009	2011	2006	2009	2011	2006	2009	2011
“I believe the management of my Company is interested in the well-being of employees”	55%	61%	52%	24%	22%	26%	21%	21%	22%
“Most of the time it is safe to speak up in my department”	68%	69%	68%	15%	16%	16%	17%	17%	16%
“I am treated with respect and fairness”	72%	74%	70%	16%	15%	17%	12%	11%	13%
“I am satisfied with my workload in my current job”	60%	63%	58%	15%	19%	20%	21%	18%	22%
“There is good cooperation between employees in my department”	76%	78%	76%	14%	13%	14%	10%	19%	10%
“Overall the physical working conditions in my department are satisfactory (e.g. ventilation, temperature, space to work)”	67%	70%	64%	14%	14%	15%	19%	17%	21%
“My immediate manager sets high but reasonable performance standards”	71%	73%	73%	19%	17%	18%	10%	10%	9%
“The work in my department is well organized”	59%	62%	56%	21%	20%	22%	20%	18%	22%
<b>Overall perception</b>	-	<b>69%</b>	<b>65%</b>	-	<b>17%</b>	<b>18%</b>	-	<b>14%</b>	<b>17%</b>

Perimeter: equivalent to manufacturing perimeter under operational control.

Opinions of employees on well-being and stress in Solvay People Survey 2006 (78% of staff), 2009 (86% of staff), and 2011 (85% of staff).

Eight themes constitute the cluster that is used to assess the overall perception of employees on well-being and stress. The eight focus statements together compose the indicator covering well-being, freedom of speech, respect and fairness, workload, inter-individual cooperation, physical working conditions, performance requirements, organization.



 **The well-being of employees is an important lever for doing business in line with the Solvay's strategy. This is consistent with Solvay's Values, in particular the "Respect for people" Value.**

**As a monitoring tool for every sites, the Solvay People Survey allows to assess well-being and stress at the level of each organizational entity. This indicator has degraded, probably related to the Horizon project<sup>(1)</sup>, the global crisis and uncertainty due to the acquisition of Rhodia.**

Every two years, following the survey, each entity defines corrective actions for weak points, in particular for well-being.

**This collective assessment process** is part of a global approach to identify, prevent, and manage stress situations in entities. Programs, when necessary, are deployed at site level. They generally involve several steps: communication, management awareness actions, specific training and coaching, individual health care, Employee Assistance Program (EAP) which are common in the US and growing in Europe.

The Group indicator on stress and well-being is examined at corporate Human Resource level to follow trends, identify alerting situations, and adapt policies and actions accordingly.

**For individual employees,** other means such as the annual personal assessment, or specific questionnaires, contribute to identifying unsatisfactory situations.

Operational managers, Human Resources managers, and occupational physicians, play a key role in managing individual stress situations.

A stress charter and Group guidelines on stress prevention are available to all entities.

<sup>(1)</sup> The aim of the Horizon project (in place since April 2011) is to reorganize the Group, as part of the strategy to make the Group a major player in sustainable chemistry.

The following management approaches are crucial to promote well-being at work:

- A work organization that is adapted to each individual with clear definition of roles and adequate training;
- Assignment of balanced workloads and objectives;
- Rules for good quality of working relations;
- Opportunities for personnel development;
- Recognition and empowerment;
- Yearly personal evaluation.



### 4.5.2. Occupational diseases (GRI LA7)

Main types notified in Western Europe, USA, and Mercosur

	Asbestos benign pathologies			Hearing disorders			Musculo-skeletal disorders			Other non-carcinogenic diseases			Asbestos cancers			Other carcinogenic diseases			All diseases		
	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
<b>Cases notified to health authorities</b>	<b>5</b>	<b>7</b>	<b>3</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>18</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>42</b>	<b>33</b>	<b>15</b>
Cases recognized as occupational disease ( )	4	2	2	4	3	1	13	9	0	0	0	0	4	2	1	3	0	0	28	16	4

(\*) Recognition in part of Western European countries.

Perimeter: equivalent to manufacturing perimeter under operational control.

Figures cover cases of occupational diseases notified to health authorities. These indicators are based on information provided by occupational physicians and medical services. Data presented reflect notifications made in countries where provisions exist for such notifications. But even there under-estimation cannot be excluded since notifications are often filed via private channels, and the employer is not systematically informed.

Data about recognition are partial because many countries have various regulations and systems for occupational diseases recognition and various compensation systems exist.

**To achieve a high-level health and physical and psychological well-being.**

**In 2011 the number of occupational diseases has further decreased. The disappearance of musculo-skeletal disorders (previously the most reported disease) is related to the sale of the joint venture Inergy, active in the manufacturing of car fuel tanks. There is an overall strong decrease in the total of notified and recognized occupational diseases, by 60% and 80% respectively.**

Most of the diseases find their origin in prolonged past occupational exposures (e.g. asbestos diseases, hearing losses or cancers): past exposures indeed caused pathologies that still manifest today. For all health problems that could be of occupational origin, an investigation is carried out, looking at both the working conditions and the characteristics of the person affected, leading to corrective measures.

Experts in prevention, including physicians, are permanently applying and developing measures resulting in further improvements of working conditions and occupational hygiene (see 4.6. Occupational hygiene, on pp. 62-63).

A further gradual decrease is then expected in the future owing to additional measures to further prevent such occupational diseases (e.g. ergonomic tool for risk assessment).

The Group permanently aims at further unifying the protocols of medical surveillance worldwide to ensure an equivalent medical follow-up and health issue detection in all entities, notably via the Medexis project (see 4.5.3. Health management, on p. 61).

Reporting on occupational diseases, although imperfect is very useful for occupational health management: the knowledge of notified occupational diseases allows investigations on working conditions and characteristics of the persons affected. This leads to local corrective measures. It also feeds global decisions at the Group level to promote similar health protection in all entities.



### 4.5.3. Health management (GRI LA8)

Deployment of the health module of Medexis

	2009	2010	2011	objective 2012
Sites with health module	8%	30%	48%	70%

*Perimeter: representative of full perimeter for the parameter, taking into account the scope of the objective (worldwide, excluding USA, excluding joint ventures).  
Number of sites with health module installed – not taking into account the (progressive) filling in of individual health data.*

**To apply the health module of the Medexis information system to 70% of the staff (not including the US) to ensure a uniform prevention against health risks and a uniform medical monitoring throughout the Group, by 2012.**

**48% of sites now have the health module of Medexis available to occupational physicians. The module has been deployed in ten additional sites in 2011: Belgium (3), France (2), Portugal (1), Mercosur (3), Italy (1). The purpose is that site physicians have been trained and have access**

**to worker’s exposure profiles and recommended medical protocols.**

Implementation of this module is linked to the level of deployment of the Human Resources database. It also heavily depends on legal approval based on national data protection legislation, resulting in constraints for Medexis expansion in some locations like Brazil, Asian sites, Bulgaria.

There are also obstacles in certain countries to get the full understanding and acceptance by workers representatives.

We are working on user-friendliness of the tool by focusing further developments on the requests of medical users.

Medexis aims at better evaluating occupational hazards and risks based on more reliable information, and to provide high quality medical follow-up tailored to each person’s risks at every site. The deployment of the two modules of the Medexis system – the health module and the occupational hygiene module – is one of 25 Solvay’s priority objectives set for 2008-2012.

Medexis is an extensive information management system for hygienists and physicians aimed at managing all occupational exposure data Group-wide, and medical data of each worker.

### 4.5.4. Health prevention

Specific health prevention programs in sites

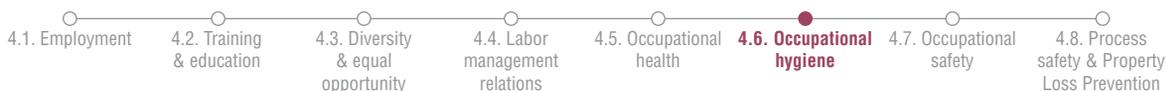
	2011
Programs for specific occupational risks (musculo-skeletal disorders, hearing losses...)	54
Programs for stress	14
Programs for health in general (obesity, cardio-vascular risks, tabagism...)	34

*Perimeter: equivalent to manufacturing perimeter under operational control.*

**Sites define and deploy whenever necessary local occupational health programs covering improvement of working environment, awareness campaigns on occupational health risks and prevention, and programs regarding stress at work and well-being, in line with Solvay guidelines.**

**In addition to addressing occupational risks via the Group occupational health program, sites deploy specific health prevention programs on an ad-hoc basis. In 2011, 80% of sites have carried out a specific health program.**

Programs addressing stress and well-being in particular have been carried out in sites where a specific need appears to be present, or in the framework of national programs.



## 4.6. Occupational hygiene

Together with occupational health, occupational hygiene aims at protecting health and well-being of personnel and to prevent diseases that could result from working conditions.

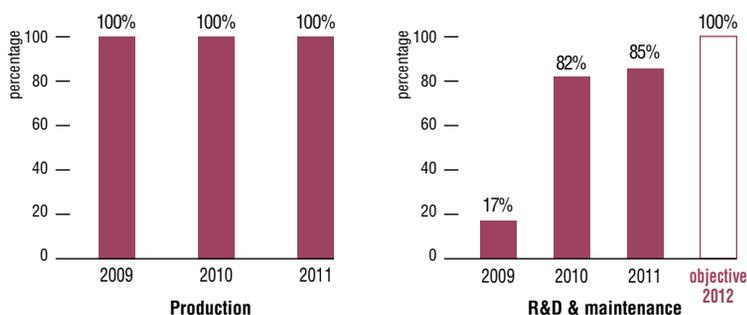
The occupational hygiene program of the Group relies on the following key elements:

- Assessing the risks related to work and exposure conditions at the workplace;
- Verifying compliance with local, international, and Solvay standards;
- Reducing exposure, informing, and training the persons in contact with occupational hazards whenever necessary.

The Medexis system of the Group (see 4.5. Occupational health, on pp. 58-61) also offers to the occupational hygienists common tools and standardized assessment methodologies and stores the data related to the assessment and control of exposure in each workplace. It allows an assessment of the performance in relation with the standards applicable.

### 4.6.1. Assessment of work stations for exposure to chemicals (GRI LA8)

Sites covered - Using the standardized Exposure Assessment Tool



Perimeter: equivalent to manufacturing perimeter under operational control.  
The assessment is considered as achieved when validated by the GS HSE.

**To assess all work stations for occupational hygiene, in manufacturing units, laboratories, R&D and maintenance units; to check compliance with occupational hygiene standards, by 2012.**

**The emphasis in the past years has been on the implementation of Solvay standardized assessment methods using the Exposure Assessment Tool (EA Tool). Priority was first given to occupational exposure in manufacturing units. R&D work stations have now been completed.**

The deployment among maintenance work stations, which represent a more limited number of persons, takes more time to undertake, because of the diversity of the functions and of the working situations.

For each workplace, compliance is checked against the local regulatory occupational limit values or the Threshold Limit Values (TLVs) set by the American Conference of Governmental Industrial Hygienists, when the local standard are less stringent. For hazardous substances without existing occupational limit value, or for which the legal limit value is outdated, Solvay defines its own

Solvay Acceptable Exposure Limits (SAELs).

The information on occupational-hygiene conditions is progressively incorporated into the hygiene module of the Medexis system (see 4.6.2. Management & control of exposures, on p. 63).



### 4.6.2. Management & control of exposures (GRI LA8)

Deployment of the hygiene module of Medexis

	2009	2010	2011	objective 2012
Sites with hygiene module	19%	44%	63%	80%

*Perimeter: whole Solvay group, equivalent to manufacturing perimeter under operational control.  
The deployment on a site is registered when the Medexis module for hygiene is implemented in this site.*

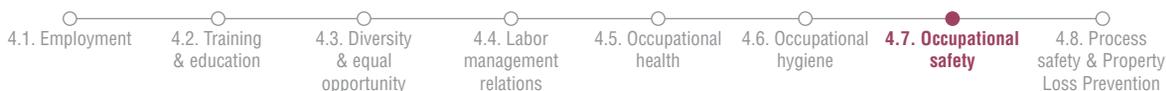
**To extend the hygiene module of Solvay’s Medexis information system to 80% of the work stations in the Group, in view of a uniform level of prevention of occupational health risks, by the end of 2012.**

**The deployment of the occupational hygiene module of Medexis which kicked off five years ago now extends to 63% of manufacturing and R&D sites (see 4.5.3. Health management, on p. 61). This gives health specialists a broad access to international, local, and Group standards regarding occupational hygiene,**

**assessment methodologies as well as all results of exposure assessments and hazards of all workplaces.**

The hygiene module of Medexis is a comprehensive information management system for occupational hygienists. All regulatory and other data related to the various possible hazards are available for industrial hygienists worldwide and are automatically loaded and available during assessments. This simplifies the assessment process and guarantees the quality of the data. Different types of reports can be extracted respecting strict confidentiality rules.

Many developments have been carried out to increase the user-friendliness of the tool and to enable occupational hygienists to assess all agents (chemicals, biological and physical agents) and ergonomic stressors.

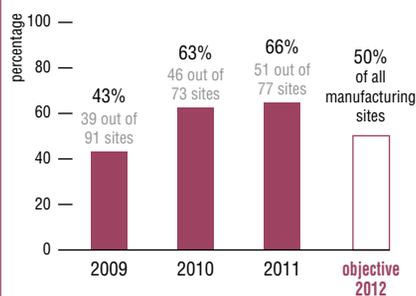


## 4.7. Occupational safety

Zero accident is the key objective. One of the five Group's Values explicitly includes safety as a key pillar. A particular focus is put on the safety program for contractors, aiming at having in each site a safety program for contractors that meets Group's standards. A second major program is the behavioral safety program, based on a dialogue on safety practices at the level of each worker, a program under deployment since several years.

### 4.7.1. Behavioral safety program

Sites with a program in line with the Group's standard



Perimeter: equivalent to manufacturing perimeter under operational control.

The behavioral safety program of the Group is based on extended, formalized safety dialogue at the workshop level, with the active involvement of the personnel.

**To extend behavioral safety program in line with the Group's standard to 50% of the sites by 2012.**

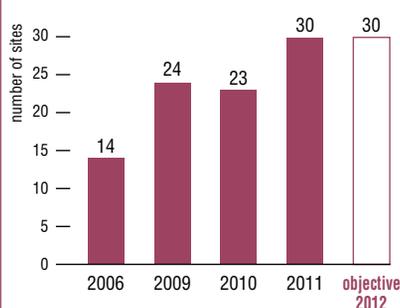
**This program, specifically addressing behavioral aspects of safety, now covers up to 66% of manufacturing sites. This goes beyond the set objective defined at the inception of the program in 2007. In 2011, the program has been extended to the US and Italy, so as to reach 90% of sites by end 2012.**

Sites and other operational entities deploy a behavioral safety program in line with the Group's standard and focused on human factors of safety, in particular risk awareness for each individual, compliance with safety rules, and opportunities for bottom-up and top-down exchanges on these matters.

This program will be further deployed in the framework of the safety culture program recently decided by the Executive Committee.

### 4.7.2. Management systems for occupational health & safety

Sites with management systems dedicated to occupational health & safety - OHSAS 18001, VPP or equivalent



Perimeter: equivalent to manufacturing perimeter under operational control.

Number of sites with certified management system OHSAS 18001 (Occupational Health and Safety Assessment Series) as equivalent. 2010 result was lower than 2009 as certifications obtained by Pharmaceuticals sites have been removed from the total due to the divestiture of this activity.

**To implement occupational health and safety management systems in line with Group standard (\*) in 30 sites by 2012.**

**The production sites progressively implement management systems for occupational health, hygiene, and safety in line with OHSAS 18001, VPP type or equivalent according to the Group's requirements for such systems.**

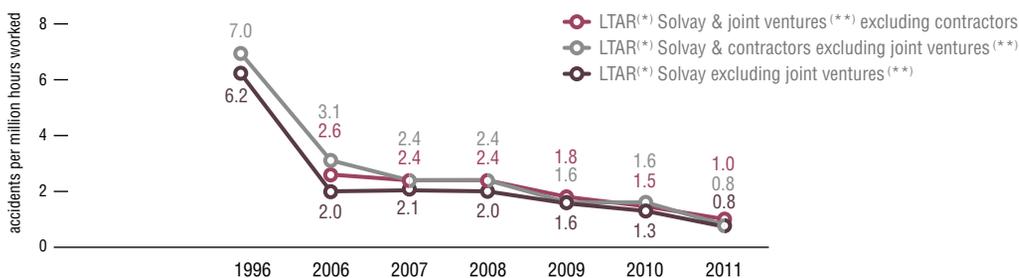
Once in place, the systems must obtain a certification from an external body. The objective set in 2008 is that at least 30 sites should have such management systems implemented and certified by 2012.

(\*) OHSAS 1800, Voluntary Protection Programs (VPP) or an equivalent in line with the Solvay standard for such system.



### 4.7.3. Accidents of people at the Group's sites (GRI LA7)

Accident frequency rates, including Rhodia in 2011



	1996	2006	2007	2008	2009	2010	2011
Gravity Rate (GR) (***)	0.18	0.07	0.06	0.05	0.06	0.06	0.05
MTAR (****)	41.7	8.3	8.0	6.9	5.1	4.8	2.9

(\*) LTAR = Accidents with lost day per million of worked hours  
 (\*\*) Joint ventures = Pipelife & Interox/Dow Hydrogen Peroxyde  
 (\*\*\*) GR = Number of lost days per 1 000 hours worked  
 (\*\*\*\*) MTAR = Accidents with medical treatment with & without lost time per million hours worked

Perimeter: equivalent to manufacturing perimeter under operational control, includes Rhodia for 2011.



#### Zero occupational accident.

The frequency rate of occupational accidents with lost time (LTAR) for Solvay's personnel and contractors' personnel further decreased, from 3.1 in 2006 to 0.8 (including Rhodia) in 2011. By comparison, the average LTAR for the European chemical industry is currently around 5.

Rhodia has been consolidated into the 2011 Group's performance for occupational safety. The frequency rate of occupational accidents with and without lost time has further significantly improved in 2011.

On a long term basis, significant progress has been progressively obtained by implementing Behavior and Contractor safety programs in the manufacturing sites. Further improvements will stem from the program of bottom-top workshops on "Health Safety Environment (HSE) culture", which started at the level of the Executive Committee.

For Solvay, the "zero accident" objective remains paramount.

However, despite prevention efforts, accidental death, in 2011, of a person working on a conveyor belt is to be deplored on Solvay site Okorusu (NA).

The Group's policy and objective is to have a common safety level for both the Solvay's personnel and contractors working on Solvay's sites.

#### Occupational safety at Rhodia

Rhodia has continuously been developing more precise indicators to track more closely the severity of accidents and the profiles of the populations concerned. As an illustration of the commitment to consistently deal with all those concerned with Health Safety Environment (HSE) problems, the overall frequency rates developed since 2006 encompass all people working on sites: Rhodia employees, temporary personnel, and contractors.

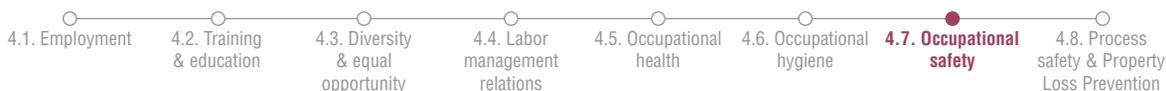
As of 2007, Rhodia decided to present more detailed results (two figures after the decimal points) that will allow to better assess progress achieved in safety results.

In 2011, an MTAR (accidents with Medical Treatment) value of 0.82 has been achieved, thus better than the target set (MTAR<1) and is Rhodia's best performance since

its creation, ranking it among the leaders of chemical companies worldwide. This performance was made possible particularly thanks to France's contribution, which significantly improved, from an MTAR of 2.7 in 2010 to 1.6 in 2011. "Only action leads to results", and France, the deployment of the Vigilance program at the level of operators in 70% of the concerned plants together with Dupont's STOP™ program for management (Safety Training Observation Program), were key elements in this progress.

The Group nonetheless deplores accidents with irreversible effects and accidents related to direct contact with chemicals. The next objective is to lower the accidents by 35% in comparison to 2010.

See 4.7. Occupational safety, on pp. 104-107.



#### 4.7.4. Fatal accidents (GRI LA7)

Number of fatal accidents, including Rhodia in 2011

	2006	2007	2008	2009	2010	2011
Solvay (*)	3	0	3	0	2	1
Rhodia (**)	0	1	0	0	1	

(\*) Number of fatalities which occurred in the Solvay group in 2010 related to occupational activities on site.

(\*\*) Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).

Perimeter: equivalent to manufacturing perimeter under operational control.

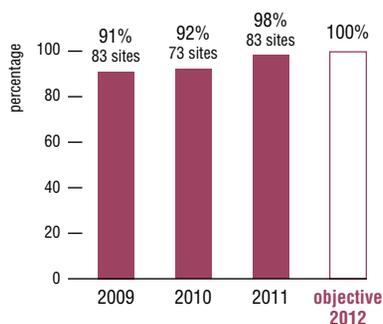
**A fatality is by essence the worst accidental situation. In 2011, unfortunately, one Solvay employee died accidentally.**

This person, while working on a belt conveyor in a fluor mining site, fell and was deadly hurt. A detailed analysis of this accident has been launched and corrective actions taken.

The latest fatal accident at Rhodia was in 2010, when an accident occurred in India at a demolition site, involving a person from an outside Company. An analysis of this accident leads to the implementation of specific procedures related to dismantling operations and Health, Safety, Environment requirements in calls for tenders for any external Company willing to get involved.

#### 4.7.5. Safety program for contractors (GRI LA8)

Sites with a program in line with the Group's standard



Perimeter: equivalent to manufacturing perimeter under operational control.

Number of sites with a program in line with the Group's standard.

**To introduce structured programs to protect the contractors against risks at all sites by 2012.**

**All sites also ensure that contractors apply the same high level of occupational health and well-being standards and share information on risks with all stakeholders.**

**The Group's Health, Safety, Environment (HSE) program for contractors has been implemented in almost all sites. The program is also extended to recently acquired sites (China, Egypt...).**

This is a key element for conveying the Group's safety culture towards the contractors and improving the safety performance.

This program covers in particular the following aspects:

- Selection of contractors;
- Contractors' qualification;
- Risk analysis;
- Job evaluation;
- Contracts.

The contractors' safety program, launched in 2006, resulted in a significant reduction of accident frequency rates (see 4.7.3. Accidents of people at the Group's sites & 4.7.4. Fatal accidents, on pp. 65-66).

The program is currently being further extended to health protection. As for the future, more targeted guidelines will be developed for construction activities and environmental protection.



## 4.8. Process safety & Property Loss Prevention

“Process safety” consists in preventing accidents in industrial installations in terms of risk to the personnel, neighbors, and the environment. “Property Loss Prevention” focuses on assets and profit, thus not specifically on health and safety of employees although also contributing to people and environment protection.

About 40 sites involve “major risks”. In all of them, specific management systems are in place to prevent accidents and their consequences. Programs are carried out to bring recently acquired plants up to the level of the Group’s standards.

### 4.8.1. Process safety management systems

 **All manufacturing sites implement a process safety management system with respect to their hazardous processes.**

**All sites requiring Process Safety Management (PSM) systems have such systems implemented.**

PSM implements safety in sites and especially those with major-risks, where they support in particular compliance with major risk regulation, and the Seveso Regulation.

#### Further programs

A particular focus to further implement process safety management systems is given at the Group level to (1) the deployment of a common methodology and generalization of the use of a common IT tool for Hazardous Operability (HazOp) studies, (2) to the improvement of Process Safety Incidents reporting using a uniform template and common database, and (3) to further progress in inspection practices referring to a Group guideline for major critical equipments: pressure vessels, pipes and safety instrumented systems. Emergency preparedness and public information plans are in place and in compliance with regulatory requirements.

Exercises and crisis simulations are held periodically, to check on and improve the plans and their practical application. SECOP, the international alert procedure is in place at the Group level to manage crisis response and communication.

#### Definition of Process Safety versus Property Loss Prevention

*Process Safety* is a disciplined framework for managing the integrity of operating systems and processes handling hazardous substances by applying good design principles, engineering and operating practices. It deals with the prevention and control of incidents that have the potential to release hazardous materials or energy. Such incidents can cause toxic effects, fire or explosion and could ultimately result

in serious injuries, property damage, lost production, and impact on the environment.

*Property Loss Prevention* focuses on the prevention and mitigation of fires, explosion and accidental chemical releases. Property Loss Prevention focuses on Assets and Profit, excluding workers’ health and safety issues from its scope, although also contributing to people and environment protection.

#### Deployment of Process Safety Management and the role of Corporate teams

PSM is under the responsibility of sites, and elements are deployed by sites under the joint support from:

- The Group’s Services Risk & Insurance entity and their external risk engineers identify risks, make recommendations and facilitate risk reduction;
- The corporate Health, Safety, Environment (HSE) management carries out ad-hoc safety performance audits, identifying specific risks and giving support to risk reduction measures.

The external Risk Engineers, belonging to the insurer FM Global, are in charge of auditing PSM systems. They assess systems and the process safety culture with particular focus on:

- Mechanical Integrity of physical plant and equipment;
- Skill and expertise in place to manage process safety and loss prevention with dependence on internal or external support;
- PSM system and framework in place;
- Loss prevention and safety culture of management, supervisory, operating and maintenance personnel towards the adherence to or implementation of an effective PSM program.



**Towards Highly Protected Risk (HPR) certification**

The standard adopted by the Solvay group is set at the HPR level and practice. This certification, given by an external Risk Engineering Company, means:

- All Process Safety Management recommendations issued by the external risk engineers are completed;

- All recommendations associated with a Loss Expectancy scenario above 10 EUR million are completed;
- All recommendations linked to the fire systems reliability are completed.

From a cultural point of view of organization, the HPR certification places the site at the generative culture in the “Hearts and Minds” meaning culture which welcomes, encourages, and rewards reporting

“bad news,” establishes a proactive attitude towards risk evaluation and risk reduction, prepares personnel to expect the unexpected and rejects complacency by nurturing constant anticipation of what can go wrong.

**A first plant has been certified HPR in 2011. Five sites are targeted as to becoming HPR certified by end 2012 amongst the 40 sites presenting the Higher Property Risk profile.**

**4.8.2. Protecting assets & business continuity**

Process Safety Management recommendations & physical protection recommendations

**Process Safety Management (PSM) recommendations - Asset protection**

	2009	2010	2011	objective 2012
Process safety recommendations completed	-	2%	15%	25%

*Perimeter: all sites owned by Solvay (>50%) or where Solvay has the operational control. Percentage of cumulative Process Safety Recommendations completed (out of total Process Safety Recommendations issued by the third party risk engineers).*

**The Property Loss Prevention program kicked off in mid 2009. By the end of 2011, 428 cumulative PSM recommendations had been issued by the external risk engineers, of which 65 (15%) were completed in 2011 and 4 (1%) in 2010.**

The objective for 2012 is to have 50 additional PSM recommendations completed (representing 10% additional completion).

**Physical protection recommendations**

Concerned sites certified “Highly Protected Risk”

	2009	2010	2011	objective 2012	objective 2015
Reduction of potential loss expectancy	-	1%	5%	10%	100%

*Perimeter: all sites owned by Solvay (>50%) or where Solvay has the operational control. Cumulative loss expectancy is a statistical metric of the simultaneous occurrence of all predictable hazardous events associated with the issued loss prevention recommendations. It is thus the sum of the loss expectancies of all open recommendations. The figures illustrate the reduction in lost loss expectancy of the identified risks.*

**To complete recommendations representing an additional reduction of 1 000 EUR million of potential loss expectancy by 2012.**

**At the end of 2011, cumulative recommendations related to physical protection represented a potential cumulative loss expectancy amounting to 21 998 EUR million.**

Recommendations related to physical protection of industrial installations prescribe capital intensive engineered systems tailored for the control and mitigation of consequences inherent to industrial losses.

Of these recommendations, 22 have been completed by the industrial sites concerned in 2011, representing a reduction of 1 020 EUR million cumulative loss expectancy (5% of the cumulative loss expectancy

for the Group identified by the risk engineers). In 2010, three of them were already completed representing 12 EUR million of loss expectancy reduction.

The external risk engineers issue physical protection recommendations based on risk scenario's whenever the scenario identifies the potential to reduce loss expectancy by a minimum of 5 EUR million in assets and/or profit.



# 5. Society



## 5.1. Wealth & income creation

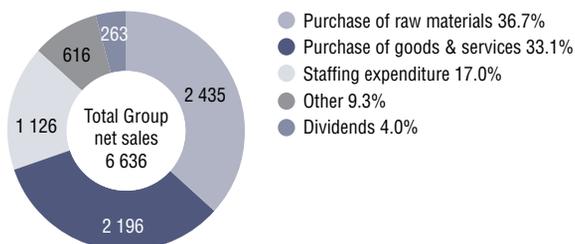
Actually, a large number of stakeholders are economically involved in Solvay’s activities, in particular neighbors of its plants, customers, shareholders, and personnel, but also the many actors of the value chain (from suppliers to customers) to which the Group and its products take part.

The contribution via Solvay products to develop new solutions responding to societal needs and the development of better and more sustainable technologies, especially along partnerships, are additional direct contributions to wealth.

Many initiatives are taken at plant level to take more part in the wealth of local communities, and it is left to the local management to take decisions corresponding to local needs and specific situations.

### 5.1.1. Distribution of generated economic value (GRI EC1)

EUR million, 2011



**The economic value generated by the Group’s activities is redistributed mostly in purchases (raw materials, goods, and services) and in personnel salaries.** The remaining part includes investment costs and dividends distribution.

*Perimeter: the figures cover the Solvay group perimeter without Rhodia, except for dividends which are the total dividends distributed by Solvay in 2011.*

*Based on income from continuing operations. Included into “Other” category: investment, taxes, acquisition of treasury shares, capital expenditures & sale of assets, and final elements.*

*The figures are reviewed by Deloitte within the global financial audit.*

*More details on the economic performance of the Solvay group are to be found in the Annual Report: [www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)*



## 5.2. Technology development

To ensure that efforts invested in Innovation and R&D do lead to a project portfolio aligned with societal megatrends, the key drivers include primarily:

- The intellectual property obtained, that directly drives the Solvay’s future differentiation;
- The adequate tapping in employee creativity to maximize the pooling of ideas;
- The creation of a sufficiently extended network of open innovation (through partnerships) to maximize its efficiency and, most importantly, tapping in the creativity and competencies of the outside world.

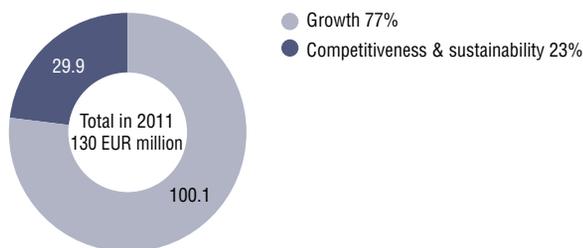
All these drivers fuel the Company’s move towards excellence in the sustainability of operations and more sustainable solutions proposed to the markets, for example in printable electronics, organic LEDs, sustainable energies, nanotechnologies or renewable based chemistry for customers that will in turn improve the sustainability of their own products and solutions.

### Five milestones in Solvay innovation process



#### 5.2.1. Expenditure efforts in innovation

EUR million, 2011, not covering Rhodia



**In 2011, the R&D expenses of the Group amounted to around 130 EUR million, i.e. 5.8% above 2010 expenses.**

Among these R&D efforts, 41% are oriented towards the development of specialty polymers with high added value, providing unique solutions to major societal challenges, in particular in the field of energy savings, alternative energy generation, digitalization techniques, health improvement, water preservation, etc.

The Group has also dedicated 23% of the total R&D efforts to corporate activities, with the clear intention to maintain long term development projects aiming at either building know-how and competencies in emerging technologies or at developing diversification and new business development opportunities through breakthrough innovations.

Those are organized around four major platforms: sustainable energy, renewable chemistry, printable organic electronics, and nanotechnologies.

The global expenditure analysis clearly underlines that over two thirds of R&D investment are targeting growth, in line with the number of partnerships concluded (see 5.2.3. Generation of innovation, on pp. 71-72).



### 5.2.2. R&D staff

	2011
Number of persons (full time equivalent) employed	808

*R&D expenses includes all expenses, whether related to the support of existing products or production processes or to the development of new products or processes, as well as to exploratory projects. These include actual labor material costs and outsourced R&D but also, infrastructure, equipment amortization, intellectual property costs and are still gross of tax credits but net of subsidies. This indicator does not include investments in start-up companies nor capital expenditures.*

*Employees include research engineers and scientists, technicians, laboratory and pilot operators, and employees dedicated to R&D facility management.*

**The total number of people employed in R&D amounted to 808 full time equivalent distributed around five major R&D centers and ten satellite centers, on three continents.**

In 2011, Solvay made definite steps in its R&D exposure to Asia, with:

- The grand opening of a R&D center in Onsan (KR) and by signing structural agreements with the EWHA Woman's University in Seoul for a further transfer of the R&D center on its campus;

- The building of a brand new R&D center in Savli, Vadodara (IN) that will be inaugurated in 2012.

### 5.2.3. Generation of innovation

Open innovation (partnerships) & ideas generation (ideation)



#### Partnerships

	2009	2010	2011
Intellectual Property (IP) agreements & cooperation agreements	753	886	923

**Building partnership ensure that the Company can tap in the competency, knowledge, and creativity of the outside world.**

Intellectual Property agreements are still increasing in number and importance (above 900 agreements

in 2011) among which more than 200 research programs/collaborations with:

- Universities and research institutes in the US, Europe (Belgium, France, Germany, UK, Italy...), and Asia (China, India, Korea...);

- Start-ups and ventures capital companies;
- Technological platforms or consortia (in particular within the European FP7) related to nanotechnologies, green chemistry or renewable energies (batteries, fuel cells, OPV, water savings...);
- Suppliers or customers.

#### Tapping in employees' ideas

	2009	2010	2011
Ideation by employees via idea box - Number of ideas	11 586	10 340	9 622
Number of accepted ideas	1 450	1 550	1 900
Number of challenges	19	35	43

**In terms of ideation, the objective is that a bottom-up innovation process encourages employees to submit ideas and is mainly organized through electronic idea boxes (called Innoplace) with more than 100 such idea boxes through the Group.**

This process is also used to launch "thematic challenges" inviting employees to come up with ideas and proposals within specific fields of interest for Solvay, and hence, channeling the creativity of the employees.

As to the monitoring of ideas, the number of accepted ideas and of number of challenges referred to hereunder cover only the data coming from *Innoplace* deployed in the Group. This does not include other additional adhoc systems of ideation that may be used in specific areas. The figure for 2009 was exacerbated by the Innovation Trophy event at the Group level that took place on that year. Among the challenges, 20% of them relate to Sustainable development on themes such as energy savings or CO<sub>2</sub> reduction.



**Among key partnership agreements**

- Two structural Collaborative Research Agreements have been concluded in Asia in 2011: one in Korea with the EWHA Women University of Seoul with a budget of 3.8 EUR million over five years, and a second one in India with the Council of Scientific and Industrial Research for research projects to be performed by its National Chemical Laboratory located in Pune.
- With partners mainly in the US, but also in Europe and Asia, Solvay aims at developing new and more efficient organic materials suitable notably for the market of printable electronics. Among key partnerships, Solvay invested in 2011 another 10 million EUR in Plextronics, a

leader in materials for Organic Light Emitting Diodes (OLED) and Organic Photovoltaic (OPV). Among other key partnerships started in 2010, Solvay's Corporate Venturing Unit took a minority participation in Polyera Corporation, Chicago, US, one of leaders in materials for the market of printable transistors and 13 EUR million participation in Korea Advanced Material Fund, a venture capital fund which focuses on renewable energies, printed electronics, clean technologies, and green chemistry.

- Early 2011, the so-called AMELIE consortium has been launched, aiming at developing advanced fluorinated materials for applications in high safety energy lithium ion

batteries for the automotive market. Solvay Specialty Polymers Italy is the leader of this three-year EU Framework Program of the European Commission project that has a budget of five EUR million (of which 70% are financed by the EC) and involves 12 partners (of which car manufacturers, battery manufacturers, and universities).

- Solvay and ACAL Energy started in 2010 to set up on the Solvay Interlox's industrial site at Warrington, Cheshire (UK), the world's first demonstration of the SolviCore fuel cell system using the new FlowCath® technology. This installation will be a major step on the commercialization road map for this innovative technology.

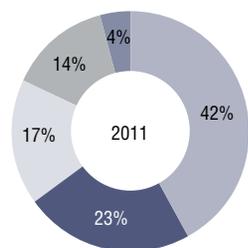
**5.2.4. Alignment of R&D & Innovation projects with societal megatrends**

Expenses distribution by megatrend & Sustainable Portfolio Management (SPM) assessment of innovative projects

**As part of its strategic objectives, Solvay is continuously aiming at aligning its portfolio of process and product innovation projects towards societal megatrends, so as to ensure long term sustainability of its current and future activities.**

**Solvay is focusing its R&D projects pipeline towards primarily four megatrends that it deems the most adequate for its product/technology range: Energy & climate change, Environment & resource scarcity, Digitalisation of the society, Health & well-being.**

**Expenses distribution by megatrend**



- Energy & climate change
- Digital world
- Environnement & resources scarcity (other than fossil)
- Others
- Health & well-being

**In 2011, the total spending dedicated to R&D projects (excluding R&D spending to support existing products and/or processes) was broken down as follows:**

- 42% of overall spending was dedicated to projects aiming at providing solutions to the energy and climate change challenges:

energy savings projects, new light weight materials, materials and solutions for alternative energy, renewable raw materials route for its current products, CO<sub>2</sub> emissions reduction projects;

- 23% was dedicated to new material development addressing the increasing needs linked to the digitalization of the world and to the beneficial multiplication of communication means in the society: new materials for cheaper and less energy consuming printable electronics,

high performance materials for smart phones, more sustainable technologies for the electronic industry;

- 17% of projects spending aimed at providing positive impact on the environment and/or addressing scarcity of resources (other than fossil fuels covered in first point): waste and emissions reduction recycling and disposal of critical products;
- 4% of projects targeted the field of health and well-being such as high performance material for medical devices.

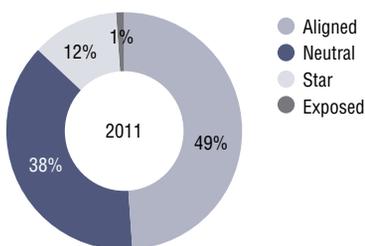


**Highlight on innovation activities in these area in 2011**

- Commissioning in Solvay Lillo (Antwerp) plant of a large fuel cell with an unmatched power of 1 megawatt (MW). The Proton Exchange Membrane (PEM) Fuel Cell converts coproduced hydrogen (H<sub>2</sub>) in the plant into electricity and is now producing at a steady rate. This is a demonstration by SolviCore at industrial scale of the potential of Solvay's specialty polymer Aquivion® PFSA membrane and ionomer and Umicore's elyst™ catalyst. Dutch companies NedStack and MTSA have built the fuel cell using SolviCore's membrane electrode assemblies.
- Fuel cells represent a key technology to produce clean energy for a wide variety of applications in the field of sustainable mobility, such as buses, cars, boats, trucks, forklifts, or cogeneration facilities and production of electricity;
- New 10 EUR million investments in the Company Plextronics for the development of innovative technologies in organic light emitting diodes and organic photovoltaic cells;
- Industrialization of a technology to produce fluorinated gases in the customer premises that will substantially reduce emissions of greenhouse gases in the photovoltaic and semiconductor industries;
- Launch of new PVDF grades for batteries to be used in electric cars (BLUECAR® of the Bolloré Group, France);
- Efficiency record reached in OPV on inverted solar cells in cooperation with Polyera (USA) and IMEC (B);
- Collaboration initiated with Avantium to develop biosourced semi-aromatic polyamides based on YXY technology from Avantium;
- Building in Thailand of a new plant implementing Solvay innovative Epicero® technology and its latest improvements for the production of bio-sourced Epichlorhydrin.

**Assessment of R&D contribution to sustainable solutions according to SPM methodology**

R&D projects "aligned" or "star" for sustainability



Perimeter: equivalent to financial perimeter.

- **Aligned:** the application is in line with at least one of the 16 sustainability megatrends of the SPM methodology.
- **Neutral:** No particular strength or weakness of the product in its application regarding any of the sustainability megatrends in the market.
- **Star:** the application of the product is in line with at least one of the 16 sustainability megatrends of the SPM methodology and has a strong growth potential.
- **Exposed:** At least one weakness of the product in its application regarding the sustainability megatrends in the market.

**In addition to the assessment of the current portfolio of activities according to the Sustainable Portfolio Management (SPM) methodology (see 1.1.1. Sustainable Portfolio Management (SPM), on p. 20), all R&D projects are assessed with the same methodology.**

**The largest part of innovation projects, whether related to existing products or aiming at the development of new products or markets, are clearly sustainability-oriented. Indeed, 61% of the R&D projects are in the "aligned" or "star" sustainability categories, thus intended to either improving**

**the footprint of Solvay's operations or bringing solutions to customers that will improve the sustainability of their own products and solutions.**

The sustainability assessment according to the SPM methodology has to be applied to all R&D projects, right from their origin. Launched in 2010, this methodology, currently undergoing an external peer review, covers by end 2011 88% of the R&D projects.



### 5.2.5. Innovation output

Patents & new sales ratios

#### Patents

	2009	2010	2011
Patents (first filling)	95	144	199

*The 2011 figure for patent filing does not include the 20 "first fillings" made by TRP-IAM for Inergy. By contrast, the figures for 2009 and 2010 do include the number of first fillings made for Inergy.*

**In terms of intellectual property, the upward trend in the number of patent applications has continued, reaching a total number of 199 in 2011 for the category of "first deposits":**

This trend is observed in both Solvay business sectors and in both the field of "essentials" and in the "specialties". Note that about twenty of these requests have been on behalf of universities in the frame of research contracts ("open innovation").

#### New sales ratios

	2007	2008	2009	2010
New sales ratios	23%	27%	23%	29% (*)

*(\*) 2010 figures have been impacted by the divestment of Inergy that has no longer been included in the perimeter. The 2011 figures are expected to be in line with those 2010.*

*Perimeter: representative of full perimeter for the parameter.*

The new sales ratio includes in two components:

- New product/services/applications ratio: the ratio of the current annual sales of new products, new applications and new services; created less than five years ago, on the total annual sales.
- New Technology Ratio: the ratio of the current annual sales being produced through implementation of new technologies for existing products, applications, and services; implemented less than five years ago, on the total annual sales.



## 5.3. Education & culture

The Group's policy on philanthropy specifically encourages initiatives at local level to support social and economic development of the communities in which it operates, in a spirit of long term relationships. This is translated more particularly into promoting local business, professional training of the local youth, reducing the social consequences related to site closures, openings, and restructuring.

At corporate level, the Solvay policy aims at concentrating sponsoring on actions and programs related to science & technology, education, and humanitarian & development projects.

### 5.3.1. Corporate philanthropy & charities

	2011
Science & technology (*) - EUR million	0.93
Humanitarian & development (**) - EUR million	0.25
Social & education (***) - EUR million	1.10
<b>Total - EUR million</b>	<b>2.28</b>

(\*) Solar Impulse.

(\*\*) Red Cross for earthquake in Japan.

(\*\*\*) XperiLAB, International Institutes for Physics & Chemistry.

Perimeter: corporate level.

The figures reported are limited to initiatives at corporate level. They do not cover numerous social actions and sponsoring initiatives taking place at local level, among Solvay's 70 locations worldwide. Relevant reporting criteria for such multiple actions are not established. Examples can be found on the sustainability pages of Solvay's website: [www.solvay.com/en/sustainability/corporatecitizenship/home.aspx](http://www.solvay.com/en/sustainability/corporatecitizenship/home.aspx)

**Solvay's corporate philanthropic actions concentrate on initiatives in the field a science & technology and education in these matters, with currently a major support to the Solar Impulse project. Charities and humanitarian initiatives make particular sense when Solvay can contribute with its products, infrastructures or competencies.**

To celebrate the centenary of the first Board of Physics and Chemistry and on top of its annual contribution to the "International Institutes for Physics and Chemistry" founded by Ernest Solvay, the Group made to them an important donation. These international research institutes are running research programs on "curiosity-driven" themes in physics, chemistry and related disciplines. One of their main activities is the periodic organization of the celebrated "Solvay Conferences in Physics and Chemistry". In addition,

they support research carried by scientists affiliated with them. Another mission of the Institutes is the popularization of science. The Institutes organize once a year "Solvay lectures" on today's big scientific challenges aimed at the general public.

Solvay particularly encourages scientific education and supports many prizes in schools and universities, as well as to major research projects in various areas i.e. neuroscience. Solvay also offers grants.

Other initiatives in the education to science area is the truck sponsored by Solvay in Belgium that drives around the country and turns into an inviting laboratory big enough for a whole class where the pupils carry out real experiments over a period of 90 minutes. This initiative is a great success and its agenda full one year in advance. See [www.xperilab.be](http://www.xperilab.be)

Further examples are the support to the development of a solar food dryer for developing countries or the continued support with Solvin to a science magazine called "Mens" dedicated to teachers and their students in the secondary school.

At local level, Solvay participates in the life of communities where it operates in many ways and through multiple initiatives: indirect and direct added value for the local economy and employment of course, but also schemes, support to local associations and initiatives.



## 5.4. Awards & recognition

### 5.4.1. Awards & recognition (GRI 2.10)

**The Group and its operational entities receive awards and recognitions testifying of being at the forefront of good management practices.**

The extra-financial reporting of Solvay has been recognized with Solvay being nominated among the two finalists of the Best Belgian Sustainability Report 2011. The jury pointed out that “the approach chosen by the Company and

its auditors is crystal clear and gives the reader a solid basis on which to establish the reliability of the information contained in the report, as well as Solvay’s general environmental performance.”

#### Amongst recent awards and recognitions received

##### US - Solvay North America

• In 2011 and for the second time, Solvay North America corporate headquarters in Houston, Texas, was awarded the Energy Star designation, exemplifying the Group’s commitment towards Sustainable development, by the federal Environmental Protection Agency (EPA)’s.

##### Argentina - Bahia Blanca

Two awards were received (2011):

- One for the reuse of cleaning water for multi-media filters.
- The other for the improvement of the effluents of the electrolysis unit.

##### Belgium - Brussels NOH

- Label “Ecodynamisme” two stars by IBGE. The award classified Solvay amongst the five top companies, for its health promotion program MOVE EUROPE (2009).
- The Solvay’s Health, Safety, Environment (HSE) advisor has been nominated a second best prevention expert by AGORIA (2010).

##### Belgium - Jemeppe

- Amongst the finalists of the technological innovation award of the Walloon Region (2009).

##### Bulgaria - Devnya Sodi

- “Eco-innovator” award received from the business newspaper “Pari” (2009).

- “Vision” award received for social responsibility and support to people with disabilities (2008).

##### Bulgaria - Devnya Sodi

- In 2011, the chemical plant Solvay Sodi received Bulgaria’s annual “Investor in the environment” award by the Bulgarian Forum of Business Leaders.

##### Germany - Bad Wimpfen

- Behavior program at site awarded by the accident insurer (BG RCI) (2011).

##### Germany - Hannover

- Ökoprofit-Award by City of Hanover and County of Lower-Saxony for Solvay GmbH (2010/2011).

##### Germany - Rheinberg

- Environmental award from the environmental Ministry of Northrhine Westfalia for involving site employees in energy efficiency programs (2010).

##### Great Britain - Lostock

- Gold Award for attaining five consecutive awards for years 2005-2009 from Chemical Industry Association (2011).

##### Great Britain - Warrington

- Chemicals Northwest “Best Community Project” award (2009).

##### Italy - Roccabianca - Padanaplast

- Commendation CEFIC European Responsible Care® Award 2011 for three projects in Italy: CO<sub>2</sub> emissions control, Safety at work, CSR Best practice in Italy.

##### Italy - Vinyloop

- Awarded as among the top ten companies for green economy “made in Italy” by Fondazione Sviluppo Sostenibili (2011).

##### India - Kalahasti

- Award for innovation (2011).

##### Namibia - Okorusu Mine

- The Okorusu site used to get the highest Health, Safety, Environment (HSE) rating by the NOSA system for safety management but lost it this year due to a fatal accident in March 2011.

##### Portugal - Povoá

- Best face to face internal communication (multiple events) by FEIEA Grand Prix (2010).
- Finalist of the Portuguese “great place to work” Award promoted by Heidrick & Stuggles and the Management magazine “Exame”; Special Mention for the “Simplex Project” (2009).



**Spain - Martorell**

- Special recognition for ten years of EMAS certification by Generalitat (Administratio of Catalonia) (2009).

**Spain - Torrelavega**

- Recognition as business partner with the dining Coorcopar solidarity (2011).
- Recognition as an institutional partner of NGOs, such as Cantabria or AMAT ALCER Torrelavega, among others (2011).

**Thailand - Map Ta Phut VINYTHAI**

- Zero accident award by the Ministry of Labor.
- Green industry certificate from the Ministry of Industry (2011).
- Award for good environment performance governance by Industrial Estate Authority of Thailand.
- CO<sub>2</sub> reduction label from Thailand Greenhouse Gas Management Organization.

**Solvay Innovation Awards**

2011 was the year of the creation of the “Solvay Innovation Awards” for the entity “Technology, Research Services, and Procurement”. In May 2011, among 33 finalists selected from among 54 projects, among which projects related to energy and Sustainable development, six were rewarded in the presence of more than 150 participants. The quality of their work, backed up by a seamless organization, played a significant role in the success of this founding event.

## 5.5. Local communities

### 5.5.1. Neighbor communication plans (GRI S01)

	Number of sites	%
Site with neighborhood communication program	41	49%

*Perimeter: equivalent to manufacturing perimeter under operational control.*

**In line with the Solvay policy, each communication program is decided and adapted to the local situation according to a subsidiary principle, with no added value perceived up to now to consolidate all of them. A large number of sites have a neighborhood communication program, 41 having a formalized communication plan.**

**Establishing projects at all sites that encourage the employees’ participation in the life of the local community.**

Engagement towards local communities is managed at local level, under the initiative of each plant’s management. The corporate neighbor communication plan towards local communities has defined two objectives set for the Group, to be achieved by 2012:

- In 2011, a strategic approach to harmonize and measuring the performance of local community dialogue initiatives was defined and a KPI was proposed to measure the outcome of the engagement with the community. Further developments will be based on the results of the opinion surveys to be available in 2012.

**Performing standardized opinion surveys about Solvay activities among the communities in the vicinity of its large production sites worldwide.**

This project was launched in 2011, based on the good feed-back from the seven sites which had already carried out such survey. A first series of standardized surveys will be performed in 2012. Twelve sites were selected and a common questionnaire was elaborated based on Solvay’s experience with previous surveys in the Iberian countries. Each site has the opportunity to include a set of questions more specifically related to its local situation.

# 6. Product responsibility



## 6.1. Regulations related to products

A central corporate entity coordinates the compliance of all products with applicable regulations and requirements. This entity keeps updated dossiers for all substances and products and updates the Safety Data Sheets (SDSs) according to regional or local requirements, a key element in the safe use and transportation of products.

The Group meets the extensive regulatory evolutions related to product safety such as those resulting from the European Union REACH Regulation and those associated to the Globally Harmonizing System (GHS) (CLP Regulation in Europe) which aim at harmonizing worldwide the classification, labeling, and packaging of substances and their mixtures.

This involves a deeper understanding and information about the use of the products all along the value chain.

### 6.1.1. Product information - REACH & GHS / CLP implementation

Solvay dossiers



#### Dossiers registered for the first REACH registration phase, 2010

	Number of dossiers	Number of dossiers as Lead Registrant	REACH dossiers submitted to ECHA by 30.11.2010	Dossiers accepted by ECHA
Chemicals	129	34	100%	100%
Plastics	41	5	100%	100%
<b>Total</b>	<b>170</b>	<b>39</b>	<b>100%</b>	<b>100%</b>

Perimeter: equivalent to European perimeter.

#### Dossiers scheduled for the second REACH registration phase, 2013

	Number of dossiers	Number of dossiers as Lead Registrant
Chemicals	41	17
Plastics	21	10
<b>Total</b>	<b>62</b>	<b>27</b>

Perimeter: equivalent to European perimeter.

 To full all the obligations associated with implementation of the European Union's (EU) REACH Regulation on chemicals.

To obtain supplementary knowledge of the conditions under which Solvay products are used, so as to assess any associated risks.

Nearly 600 chemicals and 4 000 polymers manufactured by Solvay are covered by requirements regarding information in particular for those with potential hazards and risks related to their properties and conditions of use).

#### REACH

In 2011, Solvay submitted to the European Chemicals Agency (ECHA) six new registration dossiers, eight Late Pre-Registrations, and 15 new CLP notifications. Because of new available information or upon request of ECHA, 17 registrations dossiers submitted during the first 2010 registration phase, were updated.

6.1. Regulations related to products 6.2. Sustainable consumption

The planning of dossiers' preparation for the second registration phase of REACH is on-going and on track. This second phase involves chemical substances produced or imported in quantities between 100 and 1 000 t/y. The planning is to submit before the second registration deadline of May 31, 2013, around 60 dossiers covering about 56 substances.

Because new information was made available, 11 CLP notifications submitted in 2010 have also been updated.

Last year, again, REACH inspections took place in several sites (Tavaux, Povoia, Dombasle) and all these inspections have been passed successfully.

#### CLP & GHS

The classification and labeling requirements foreseen in the frame of the EU Regulation on the Classification, Labeling, and

Packaging of substances and mixtures (CLP Regulation) have been integrated to the Solvay's European Safety Data Sheets (SDSs). The deadline for individual substances within the EU has been met.

The CLP Regulation came into force in December 2010 and applies to all Solvay's substances and their applications, and for all activities relating to their production, import, marketing, and uses. The deadline for its application for substances in mixtures is 2015 but several Solvay SDSs of mixtures are already compliant with CLP.

In line with the requirements of the worldwide Globally Harmonized System of Classification, and Labeling of Chemicals (GHS), Solvay also increasingly developed in 2011 SDSs according to these requirements for other Countries as South Korea, Brazil...



An information leaflet on the application of CLP for customers is downloadable via the website: CLP information leaflet.

[www.solvay.com/EN/Sustainability/productsustainability/Classification/Documents/Leafletcustomer-EN-Definitive%20version.pdf](http://www.solvay.com/EN/Sustainability/productsustainability/Classification/Documents/Leafletcustomer-EN-Definitive%20version.pdf)

### 6.1.2. Product safety information (Europe)

Safety Data Sheets & compliance to European Union's REACH Regulations

	2010	2011
Revisions of Safety Data Sheets, to comply with REACH & CLP (Classification, Labeling, and Packaging) requirements	56%	100%

*CLP is the new EU Regulation on Classification, Labeling, and Packaging of substances (excluding their mixtures) which came into force on December 1<sup>st</sup> 2010. The deadline for its application to mixtures is 2015.*

**To improve the knowledge about risks associated with the use of Solvay products in their various applications, within the scope of REACH.**

**To extend the SACHEM (Information on the safety of Solvay products) project worldwide, including in the new requirements of the Globally Harmonized System (GHS) of classification, labelling of chemicals.**

**Solvay has a central management for product safety information. A key element of this management is SAFECHEM (SAFETY of CHEMicals), an integrated**

**information system on its substances and products.**

It is based on a central database aiming at assisting compliance with all applicable regulations worldwide. The system is aimed at ensuring consistency of the information on Solvay products, notably through the production of SDSs bringing together systematically all the required information on the hazardous properties of each substance and the risks associated with their use. An internal workshop was organized in 2011 to train on the use of the electronic (e-SDS) compliance check-tool.

#### Product Safety Summaries

Within a project initiated by the International Council of Chemical Associations (ICCA), Solvay committed to produce Product Safety Summaries (PSS) which are short and simple descriptions of the main Solvay products: properties, uses, potential health and environmental hazards described in a language understandable by the layman and a large public. About 50 PSS are already available which makes of Solvay one of the most advanced Company in Europe. These PSS are available on the ICCA website and will very soon be downloadable from the Solvay websites.

### 6.1.3. Substances of Very High Concern (SVHC)

Substances put on the market or used as intermediate raw materials by Solvay and classified Carcinogenic, Mutagenic or Reprotoxic (CMR), category 1

TII = Transported isolated intermediate under REACH  
 OSII = On-site isolated intermediate under REACH  
 H350 = May cause cancer  
 H340 = May cause genetic defects  
 H360 = May damage fertility of the unborn child

	Finished product (substance)	Monomer	Production intermediate - Transported (TII)	Production intermediate - On-site isolated intermediate (OSII)	Impurity in finished product	Imports	Total
Substances classified as carcinogen - <i>Category 1A &amp; 1B (H350 according to CLP)</i>	1	6	2	1	1	5	16
Substances classified as mutagen - <i>Category M 1A &amp; 1B (H340)</i>	0	0	0	0	0	0	0
Substances classified as reprotoxic - <i>Category R 1A &amp; 1B (H360)</i>	2	0	1	1	5	0	9
<b>All substances concerned</b>	<b>3</b>	<b>9</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>25</b>

Perimeter: equivalent to manufacturing perimeter under operational control.  
 Number of substances manufactured, imported, and put on the market by Solvay which are classified as Carcinogenic, Mutagenic or Toxic to Reproduction (CMR) category 1. Besides, 38 substances purchased by Solvay are classified as CMR category 1 or 2.

**Three substances sold by Solvay only are classified as Carcinogenic, Mutagenic, or Toxic to Reproduction (CMR).**

**The substances are sold to industrial customers to be used exclusively as chemical intermediates for the production of other materials (a.o. to produce polyester resins).**

**None of the substances submitted by Solvay in 2010 to REACH registration were classified as Persistent, Toxic, or Bioaccumulable (PTB), neither very Persistent, very Bioaccumulable (vPvB).**

The risks associated to the production and the use of these substances are well managed and controlled and no alternative is presently available that could lead to their possible substitution.

In 2011, a multidisciplinary team was set up at corporate level to address the so-called *Substances of Very High Concern (SVHC)*. The role of this advisory team is to support the business to ensure a proactive and sustainable management of SVHC

that are manufactured, imported, and placed on the market and/ or used by Solvay. While providing recommendations to the business in defining their product strategy positioning, the team contributes to securing business continuity in respect to legal duties and Responsible Care® commitment.

#### Context

In the framework of the authorization process of the REACH Regulation, Member States competent authorities or the European Chemicals Agency (ECHA), upon request of the European Commission, may prepare dossiers for the identification of SVHC.

These substances are those which are:

- *Carcinogenic, Mutagenic, or Toxic to Reproduction (CMR)*, meeting the criteria for classification in accordance with the new Regulation on Classification, Labeling, and Packaging of chemical substances and

mixtures, the so-called “CLP” Regulation;

- *Persistent, Toxic and Bioaccumulative (PTB)* or very Persistent and very Bioaccumulative (vPvB) and classified as such according to the criteria of the REACH Regulation;
- Identified, on a case-by-case basis, through scientific evidence indicating to cause probable serious effects to human health or the environment of an equivalent level of concern as those above (e.g. substances classified as “endocrine disruptors”).

## 6.2. Sustainable consumption

For the existing products portfolio, Solvay supports customers in assessing and improving the full lifecycle of the finished products. Establishing the environmental profiles of products and taking an active role in recycling schemes are two key elements in this respect.

Solvay has the objective to be a global industrial reference in sustainable chemistry and to enlarge the portfolio of products and of markets supported by good sustainability perspectives. Acquiring Rhodia's portfolio is a key step in this direction.

### 6.2.1. Product recycling - An evaluation for Solvay key products (GRI EN2)

Contribution to the recycling of products at the end of their lifetime

	2009	2010	2011
PVC recycled - Tons	3 100	3 600	5 600

*Some technical issues due to the installation of new filtration equipment encountered in 2010 were fully solved in 2011. The new filtration tool increased the quality level and quality consistency of the PVC (R-PVC) recycled.*

**To help achieve the Vinyl 2010 target for PVC recycling in Europe (200 kt/y) by 2012.**

**To develop a partnership with a major customer for recycling of the polymer PVDC, based on Vinyloop® recycling technology, by 2012.**

**The offer SF<sub>6</sub> recycling services also to Solvay customers in the Asian market.**

**Within the lifecycle of a product, Solvay is usually one player among others in the recycling initiatives and the management of the end of its lifetime.**

Also, many chemicals are reactive chemicals that are irreversibly consumed or transformed when used. Quantitative indicators are difficult to establish due to the diversity of products, applications, and stakeholders' initiatives and given the complex perimeters to take into consideration. Solvay has always been proactive in terms of developing recycling technologies and schemes related to its products and in promoting initiatives through various ways, i.e. specialized federation initiatives. Solvay is also active within Plastics Europe regarding the initiative related to the challenges of plastic marine litter.

#### Vinyls applications

SolVin has been one of the initiators and catalysts of the Vinyl 2010 commitment of the European Council of Vinyl Manufacturers (ECVM). All objectives were successfully met and even exceeded expectations. In particular the one to recycle 200 kt/y of PVC was met and exceeded its goal by reaching 260 kt PVC recycled (details on [www.vinyl2010.org](http://www.vinyl2010.org)). A new 10 years commitment multi-partner program for PVC in Europe was established: VinylPlus. It encompasses five axes, including recycling (800 kt objective by 2020), organochlorine emissions, additives...

SolVin was always a key player in these programs and has scored goals in its action plans aligned with those of VinylPlus. The SolVin general manager is presently the chairman of the VinylPlus board.  
See: [www.vinylplus.eu](http://www.vinylplus.eu)

#### Vinyloop®

The year 2011 was a success for the recycling process VinyLoop®: the new filtration technology is running well and produces a high quality and consistent recycled PVC (R-PVC) and the sales increased up to 5 600 t of R-PVC. The jury of the Italian 2011 Sustainable development Award

Regarding end-of-life products, in particular plastics, Solvay is committed to:

- Developing recycling processes, bringing Solvay's technology know-how in the development of recycling technologies in areas where high tech, more sophisticated solutions are needed;
- Encouraging the establishment of multi-partner schemes for collection and recycling, at regional and national levels.

from the Sustainable development Foundation recognized Ferrara's VinyLoop® plant as one of the Top Ten "Green Economy Companies" in Italy in the field of waste treatment and Sustainable development.

A recent analysis of life cycle (LCA) of a PVC recycled via the Vinyloop process has a 46% lower climate impact and a 39% reduced primary energy consumption compared to the production of virgin PVC. Moreover, the process complies with ISO 14404-44. Furthermore, the plant was REACH certified and is fully compliant with the European Regulations.

See: [www.vinyloop.com](http://www.vinyloop.com).

6.1. Regulations related to products

**6.2. Sustainable consumption**

### SOLVAir®

For the past 10 years, Solvay has developed the recycling of salt residues recovered from the use of sodium bicarbonate in waste incinerators to neutralize acidic flue gases (mainly hydrogen chloride (HCl) and sulfur dioxide (SO<sub>2</sub>)). Effective over a wide temperature range, the process has been successfully implemented at many coal-fired power plants and other industries or waste incinerators in Europe. This service, originally called Neutrec®, is now proposed by SOLVAir®. It takes back and purifies the salt residues in installations in France (Resolest®) and in Italy (Solval®) with capacities of respectively 50 kt and 30 kt/y. The recovered and purified sodium chloride is recycled as raw material in soda ash manufacturing, replacing “virgin” salt.

In 2011, SOLVAir presented recent pilot plant studies made at EERC, University of North Dakota, related to dry injection of trona and sodium bicarbonate for multi-emissions control. These trials were very appreciated by the American administration as part of its thoughts on legislation on air emissions control.

See:

[www.solvair.us/EN/Homepage.aspx](http://www.solvair.us/EN/Homepage.aspx)  
[www.solvairsolutions.com/docroot/neutrec/static\\_files/attachments/rosignano\\_en.pdf](http://www.solvairsolutions.com/docroot/neutrec/static_files/attachments/rosignano_en.pdf)

[www.solvairsolutions.com/docroot/neutrec/static\\_files/attachments/brochure\\_generale\\_resolest\\_fr.pdf](http://www.solvairsolutions.com/docroot/neutrec/static_files/attachments/brochure_generale_resolest_fr.pdf)



### Fluorinated products - Sulfur hexafluoride (SF<sub>6</sub>)



Solvay Fluor offers a worldwide recycling service for SF<sub>6</sub> in Bad Wimpfen (D) as well as in Onsan (South Korea). The United Nations Framework Convention on Climate Change (UNFCCC) has recognized Solvay's SF<sub>6</sub> recycling efforts and registered a particular SF<sub>6</sub> recovery and reclamation Clean Development Mechanism (CDM) project in South Korea.

SF<sub>6</sub> is a highly efficient, highly valued insulating gas for medium and high voltage equipment. It is chemically inert, non flammable, non toxic, and non corrosive. SF<sub>6</sub> allows simplified design of switchgears mainly because of size reduction, quiet, and reliable handling and maintenance. As SF<sub>6</sub> has a very high Global Warming Potential (GWP), its emissions must be carefully avoided. The quantity reclaimed in 2011 was about 50 t.

### Fluorinated / Chlorinated hydrocarbons (CFCs, H-CFCs, HFCs)

Solvay Fluor offers a recovery service through a dedicated high temperature destruction facility in Frankfurt (D) of CFCs and H-CFCs gases which have an Ozone Depletion Potential and also a relatively high Global Warming Potential (GWP). Due to their impact on the environment, these substances were regulated and their emissions should be avoided. To this end, this unique installation is operated in line with the requirements of the European Union waste directive to produce secondary raw materials – hydrofluoric and hydrochloric acids – that are recycled in industrial processes. In 2011, about 300 t of recovered CFC / HCFC / HFC mixtures have been treated.

### Some chemicals recycled indirectly

Many of the main Solvay chemical products are consumed during their lifetime and can therefore not be recycled as such at the end of the product lifecycle. Meanwhile, soda ash, for example, which represents a significant constituent of glass (±20%) is indirectly recycled via the very efficient glass recycling schemes.

**6.2.2. Ecoprofiles of product portfolio**

	2009	2010	2011
Products for which ecoprofiles have been established	50%	95%	95%

*Perimeter: equivalent to financial perimeter.  
The advancement of the program is measured on the basis of the turnover of the concerned products.*



**To assess product information of ecoprofile-type for:**

- Any existing major product;
- Any product with critical characteristics (in relation to sustainability);
- Any new product.

**The ecoprofile program is fully deployed. Extensive ecoprofiles are now available for the largest part of Solvay products.**

The limiting factor for the remaining products that do not yet have full ecoprofile data is often the difficulty to get data for some of the raw materials used to produce them: they may be very diverse, of multiple origins, thus with no reliable data yet available from suppliers.

The effort of the teams dedicated to lifecycle assessments is now focusing on the adaptation of available ecoprofiles to the recent improvements in the international databases and to improvements made in Solvay manufacturing processes: energy consumption, emission of specific substances, water intake, etc.

**Ecoprofiles and lifecycle assessment activity**

The ecoprofile of a product is the inventory of all environmental footprints of a product, from its raw materials down to the environmental impact resulting from its manufacturing processes (“cradle to gate” approach).

Solvay’s ecoprofiles allow to carry out internal benchmarks and allow integration into average calculations made by producers association’s who publish average ecoprofiles.

Ultimately, ecoprofiles are typically used by customers to obtain Lifecycle Assessments (LCAs) of a given application of a chemical or plastic.

Ecoprofiles are used for the Sustainable Portfolio Management assessment (SPM) of Solvay’s portfolio of products and markets (see 1.1.1. Sustainable Portfolio Management, on p. 20).

Solvay  
Rhodia

Solvay Rhodia

Solvay  
Rhodia  
Solvay  
Rhodia

## Indicators & performance for the Rhodia sector

Due to the recent take-over of Rhodia, indicators and progress up to the end of 2011, and the deployment of the management elements that support the extra-financial performance of the Company have not yet been integrated into a unique, consistent reporting.

Thus, they are addressed in two distinct sections: one for Solvay (Chemicals and Plastics sectors), and one for Rhodia (Rhodia sector (see on p. 84)). The performances reported clearly demonstrate a strong convergence. Workstreams are under way to build a unified, consistent sustainability strategy and reporting for 2012.

Financial data (1.1.2. End markets, 2.1.1. Net sales), presented in the chapters “[1. Profile of the organization](#)” and “[2. Economic performance](#)” of the Solvay Chemicals & Plastics section, already include Rhodia’s activities. This is also the case for the indicators “[4.1.1. Employment by region](#)”, “[4.7.3. Accidents of people at the Group’s sites](#)”, and “[4.7.4. Fatal accidents](#)”.

The following pictograms are used:



Other sections in the document give related additional information.



Since 1993, PwC Auditors was commissioned to audit the reliability of key elements of Rhodia’s Sustainable development reporting. Since the Responsible Care® information reporting system is well developed within the Group and its internal control is well-structured, the level of verification requested by the Group is moderate assurance on data.

See assurance report on pp. 124-125, focusing on environmental parameters: greenhouse gas emissions, other emissions (acidification, volatile organic compounds, eutrophication, chemical oxygen demand, water withdrawals, etc.).



## 3. Environmental performance

The preservation of the natural environment in which Rhodia's activities are located is an essential axis in the Sustainable development policy: it is one of its firm commitments in its Rhodia Way® approach.

As a responsible chemical Company, Rhodia makes significant investments in health, safety and the environment to control the risks linked to its activity and to improve its environmental footprint, particularly its emissions into the air, water, and soil.

These objectives are taken into consideration very early on, at the research and development level, which includes, among its missions, designing products and processes with less impact on the environment and that are more energy efficient. Implemented throughout the entire process, beginning from Rhodia's laboratories and ending at its customers' sites, product risk management aims to limit incidents and accidents that impact the environment.

By equipping itself since 2005 with an ambitious environmental plan by 2015, Rhodia confirms its intention of staying in the lead in its sector with respect to Corporate Social Responsibility (CSR) matters. The plan selected is oriented around two major strategic axes: management of risks linked to accidental emissions and reduction of Rhodia's environmental footprint. With regard to the management of risks of accidental emissions, emphasis will be placed on prevention by reinforcing risk analysis methods. To capitalize on its results as shown below in the indicators performance Rhodia has resolved to continue its rate of progress on seven priority indicators, by renewing its goals of reducing impacts by 2015, a challenge of great scope in the context of growth of production.

Indicator and Objective of Reducing Impact 2005-2015 <sup>(*)</sup>	Impacts Measured	
Emission of greenhouse gases: -66%	Accidental emissions of greenhouse gases <sup>(*)</sup>	
Effect on soil: Acidification of the air <sup>(*)</sup> : -40%	Emissions of nitrogen oxide (NO <sub>x</sub> <sup>(*)</sup> ) and sulfur dioxides (SO <sub>x</sub> )	
Impact on tropospheric ozone: -20%	Emissions of VOC <sup>(*)</sup> (volatile organic compound)	Air
Impact on water, eutrophication <sup>(*)</sup> : -40%	Emissions of nitrogen and phosphorous	
Detrioriation of the aquatic milieu: -40%	The Chemical Oxygen Demand (COD <sup>(*)</sup> ) of the milieu	Water
Indicators and Objective of Reducing Impact 2010-2015 <sup>(*)</sup>	Impacts Measured	
Consumption of water related to activity: -10%	Efforts to reduce consumption	
Consumption of energy related to activity: -8%	Efforts to reduce energy consumption	
Biodiversity: Deployment of ecotoxicity measurements	Concerning emissions at 22 targeted sites <sup>(**)</sup>	New indicators

<sup>(\*)</sup> The 2015 target takes an estimate of absolute emissions associated with development projects into account in the framework of the enterprise project.

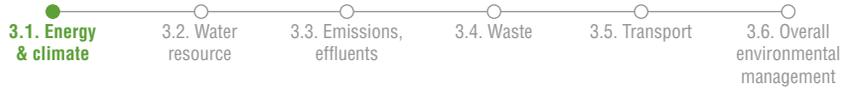
<sup>(\*\*)</sup> Not integrated into a wastewater network shared with other industrial or community sites.

At the same time, Rhodia is strengthening its system with two indicators since 2010 regarding the impact of activities on natural resources – energy efficiency and water intake - and adding a new axis to work on biodiversity, including measurement of the impact on aquatic life.

Rhodia is demonstrating its desire to anticipate longterm trends by currently addressing the issue of the increasing scarcity of water and fossil fuel. On the first point, the objective is to reduce water intake by 10% at all sites combined over the next five years. With respect to energy efficiency, the goal is to decrease the Rhodia's consumption of non-renewable resources (-1.5% a year in the energy consumption per ton of product). Joint actions between the industrial management and the research and development management have been brought to study processes and technologies adapted to the new concerns.

The protection of the biodiversity of natural aquatic milieu integrated into the Rhodia Way® framework requires impact studies and a disclosure obligation going beyond the regulatory obligations at the 22 sites involved (sites not integrated into a wastewater network shared with other industrial or community sites).

Rhodia applies its integrated management system RCMS which is equivalent to ISO 14001 in all its production sites and research centers. In addition in 2001, 25% of production sites have been externally certified according to ISO 14001 or EMAS.



## 3.1. Energy & climate

### 3.1.1. Energy consumption (GRI EN3 - EN4)

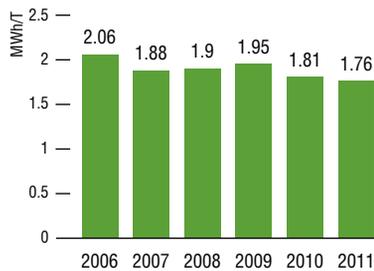
#### Breakdown of energy sources

	2006	2007	2008	2009	2010	2011
Fossil fuels - 1 000 Terajoules	58.33	49.84	44.17	40.25	41.86	39.98
Electricity - 1 000 Terajoules	8.82	7.72	8.09	6.23	6.91	6.80
Thermal energy (steam) - 1 000 Terajoules	6.84	7.47	8.77	7.41	8.21	9.61
<b>Total energy consumption<sup>(1)</sup> - 1 000 Terajoules</b>	<b>73.99</b>	<b>65.03</b>	<b>61.03</b>	<b>53.89</b>	<b>56.98</b>	<b>56.40</b>

<sup>(1)</sup>Including substitution fuels.

Perimeter: equivalent to perimeter under operational control; historical data.

#### Energy efficiency



Perimeter: equivalent to perimeter under operational control. Data of the year with a historic perimeter.

**To further increase energy efficiency (consumption of energy per ton produced), reaching additional energy efficiency of 1.5% every year between 2010 and 2015 (8% over the period).**

Energy Services handles Rhodia's supply of energy and manages Rhodia's projects in the field of greenhouse gas emissions reductions in conformity with Rhodia's commitment to fighting global warming.

In the energy field, Energy Services directly manages energy purchases for the sector in France, as well as for industrial third parties, representing 35% of natural gas and 50% of electricity purchased. In France, Rhodia is the second largest industrial buyer of gas and is ranked among the 10 largest electricity buyers.

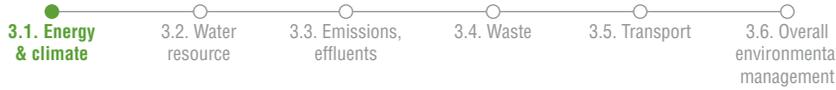
Energy Services' mission is also to optimize energy production assets. In this context, energy efficiency actions focusing on improving the operation of cogeneration installations (installations allowing for both thermal energy and electricity being produced with gas turbines) have been undertaken.

At a worldwide level, Rhodia uses less than 2% of coal for its production of heat and electricity, thus reducing its carbon footprint.

Moreover, Energy Services is a founding member of Exeltium, the consortium of French electricity-intensive industries buying electricity in France; Rhodia has been purchasing from Exeltium since May 2010 through a long-term electricity purchase agreement at prices based on nuclear production costs.

Finally, Rhodia is mobilizing its experts to constantly improve the performances of its processes. It has set itself the goal of increasing its energy efficiency (consumption of energy per ton produced) by 1.5% every year between 2010 and 2015 (or 8% over the period).

Between 2010 and 2011, energy efficiency energy consumption per t produced have been improved by 2.9% for all Rhodia production processes.

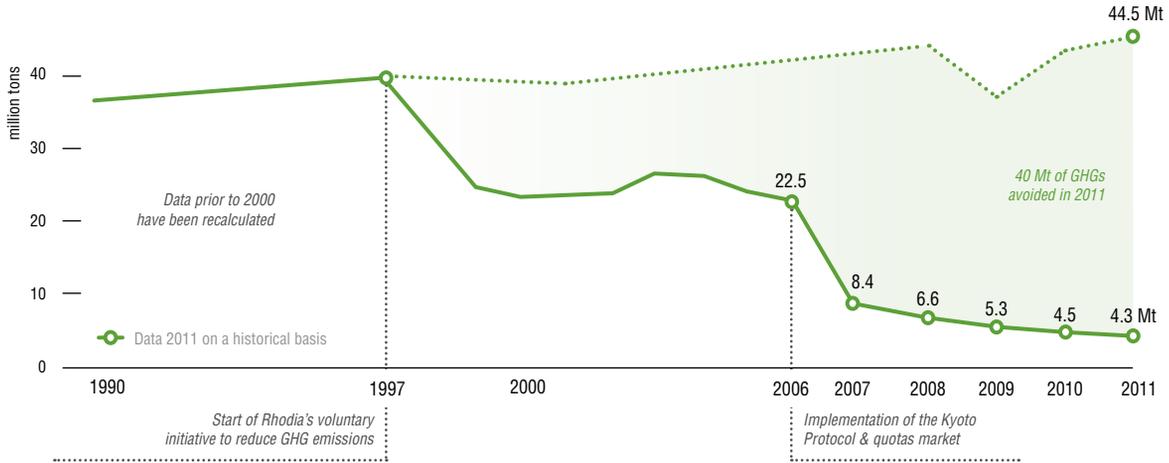


reviewed by PwC  
See pp. 124-125

PwC Auditors was commissioned to audit the reliability of key elements of Rhodia's Sustainable development reporting.

### 3.1.2. Greenhouse gas emissions in relation to manufacturing activities (GRI EN16)

Kyoto Protocol – (CO<sub>2</sub><sup>(\*)</sup>, CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, PFCs, HFCs) & other greenhouse gases  
Direct & indirect emissions (Scope 1+2)



	2006	2007 <sup>(*)</sup>	2008 <sup>(*)</sup>	2009 <sup>(*)</sup>	2010 <sup>(*)</sup>	2011 <sup>(*)</sup>
CO <sub>2</sub> emissions - 1000 Tons	5 709	4 362	4 011	3 579	3 878	3 911
Other greenhouse gases (Kyoto Protocol) - 1 000 Tons equivalent CO <sub>2</sub>	15 842	3 094	1 979	1 727	612	371
Other greenhouse gases - 1 000 Tons equivalent CO <sub>2</sub>	1 009	947	574	29	34	35
<b>Total greenhouse gases - 1 000 Tons equivalent CO<sub>2</sub></b>	<b>22 560</b>	<b>8 403</b>	<b>6 564</b>	<b>5 335</b>	<b>4 524</b>	<b>4 316</b>

(\*) After restatement (replacement of the coefficient used worldwide by Rhodia with national coefficients for electricity).  
Perimeter: equivalent to perimeter under operational control. Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).

**For all production units, Rhodia tracks all greenhouse gas emissions covered by the Kyoto Protocol, as well as emissions of other gases with a greenhouse potential not covered by this Protocol.**

40 million t of greenhouse gases have been avoided in the past 17 years.

Since 2005, the date of its first commitment to strongly decrease its emissions in absolute terms, Rhodia has reduced its greenhouse gas emissions by nearly 80%, thus surpassing its 2015 goal already (-66% compared to 2005).

Reductions have primarily been achieved with installations aimed at destroying nitrous oxide emissions

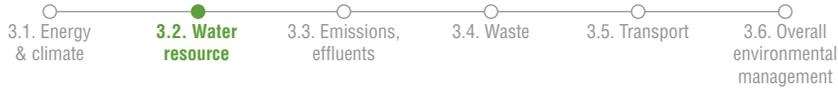
(N<sub>2</sub>O, at the sites Paulinia, Onsan, and Chalampé) or fluorinated gases (Salindres site). Reductions have led to a production of approximately 14 million t of ERUs and CERs a year (units of value under the Kyoto Protocol representing 1 metric teq CO<sub>2</sub>).

Without this voluntary reduction of emissions started in 1997 (with the first N<sub>2</sub>O destruction unit at Chalampé), emissions would have been approximately eleven times greater than they actually are, at 44 million teq CO<sub>2</sub> in 2011.

For 2011, the additional drop in emissions compared to 2010 is linked primarily to the full-year operation of an additional investment at the Chalampé site intended to improve destruction of nitrous oxide (N<sub>2</sub>O)

emissions. It very largely offsets the increases in emissions resulting from the growth in production volume, the acquisition of the Zhangjiagang Feixiang (CN) site and the start up of the silica unit at the Qingdao Chengyang (CN) site.

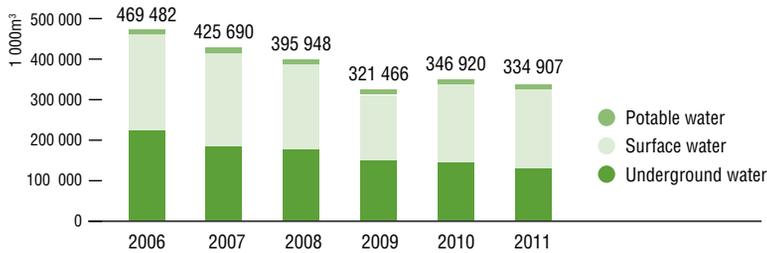
Finally, Rhodia is committed to increase its energy efficiency (see 3.1.1. Energy consumption, on p. 87) which has a direct positive impact on scope 1+2 emissions.



## 3.2. Water resource

### 3.2.1. Water intake (GRI EN8)

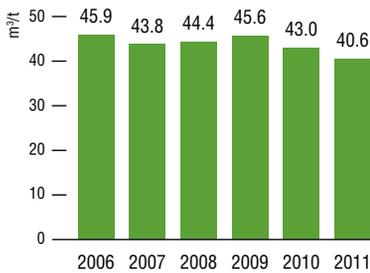
#### Distribution of water draw-offs



	2006	2007	2008	2009	2010	2011
Potable water - 1 000m³	17 901	12 237	12 676	10 946	11 951	14 208
Surface water - 1 000m³	233 581	233 638	211 959	165 928	194 665	195 413
Underground water - 1 000m³	218 000	179 815	171 313	144 591	140 304	125 287
<b>Total - 1 000m³</b>	<b>469 482</b>	<b>425 690</b>	<b>395 948</b>	<b>321 466</b>	<b>346 920</b>	<b>334 907</b>

Perimeter: equivalent to perimeter under operational control.  
 Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).

#### Specific water intake



Perimeter: equivalent to perimeter under operational control.  
 Data basis at December 31 of the year under consideration.

**As with energy, Rhodia is committed to reduce its specific water intakes by 10% between 2010 and 2015 by working on all of its operating sites to optimize manufacturing processes and by promoting water-saving behaviors.**

In 2011, intakes of surface water, groundwater and municipal water, used mainly for cooling installations, have declined by 3.4% between 2010 and 2011 (i.e.-12 million m³, data of prior years unchanged). This corresponds to a performance of 5.7% in water efficiency (m³/t) taken into account volume evolution (water usage).

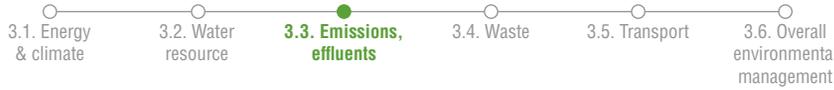
Reductions are mainly due to groundwater savings. Note that these intakes include those from the new Zhangjiagang Feixiang, Zhenjiang Novacare, and Qingdao Chengyang sites in China, reporting for the first time, with a contribution of nearly 1.7 million m³.

Although Rhodia's water intake amounts to 335 million m³ (2011), nearly 930 million m³ were recycled in self-cooling closed-loop towers that Rhodia operates on its sites, so avoiding additional water abstraction from elsewhere for such cooling purposes.

The inventory of Rhodia sites located in regions under water stress has been updated to take into account the change of the models. There are eight sites operating in areas under high stress, and around ten sites in areas under moderate hydric stress (representing under 30% of Rhodia's industrial sites). These sites are preparing their strategy for better management of risks (increased costs, shortages, limits on intake, regulations).

reviewed by PwC  
 See pp. 124-125

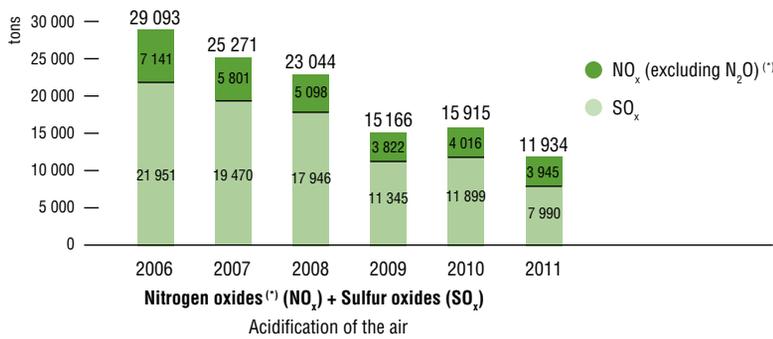




## 3.3. Emissions, effluents

### 3.3.1. Emissions to air (GRI EN19 - EN20)

#### Effects on the ground



(\*) NO<sub>x</sub> is also a precursor, by reaction with VOC's, of tropospheric pollution (ozone).

Perimeter: equivalent to perimeter under operational control.

Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).

**In 2005, Rhodia committed to significantly reduce its absolute emissions of gases responsible for acidification of the air (SO<sub>x</sub> + NO<sub>x</sub>), by -20% by 2010. This objective was set again in late 2010 for a five year period.**

In late 2011, the drop recorded was 56% as compared to 2005.

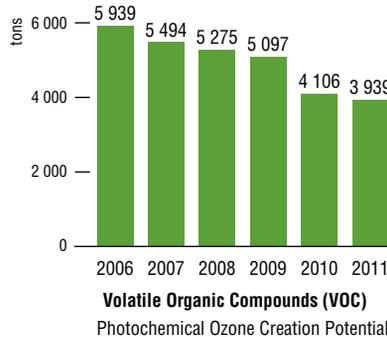
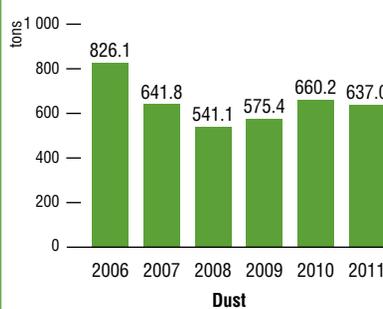
The improvement actions involved primarily combustion equipment (improvements in burners, use of cleaner fuels, addition of catalysts) or abatement of SO<sub>x</sub>.

Emissions have been reduced by 4 000 t between 2010 and 2011 (-25%).

This significant further decrease was achieved thanks to the full-year operation of the SO<sub>x</sub> abatement unit No. 2, started up in November 2010 at the Baton Rouge site in the US (GBU Eco services).

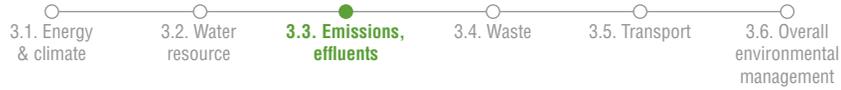
Rhodia Eco Services collects used sulfuric acid from refineries, where it is used as a catalyst for producing alkylate, an essential component of high-octane gasoline. In the

refining process, the sulfuric acid accumulates impurities which impair its catalytic capacity. Rhodia Eco Services purifies the used sulfuric acid in high temperature ovens operated with natural gas, then returns it to the refineries where it can be reused.



Perimeter: equivalent to perimeter under operational control.

Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).



**Dust**

Dust emissions were reduced by 4% in 2011 compared to 2010. This is due primarily to the efforts at the Collonges site in France involving its precipitated amorphous silica filtration units (preventive maintenance).

**Volatile Organic Compounds (VOC)**  
**In 2005, Rhodia set an objective for the absolute reduction of its VOC emissions by 10% by 2010. VOCs**

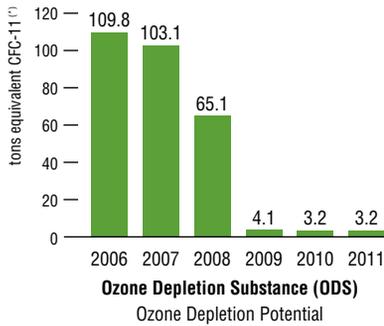
**are precursors of tropospheric ozone (responsible for affecting the respiratory system).**

The use of acetone as a solvent in the manufacture of acetate cables (GBU Acetow) is the primary source of emissions and has been the focus of numerous reduction-at-source programs. The -10% objective has been renewed in 2010 for another five years period. In late 2011, the drop recorded was 39% compared to 2005.

In 2011, total discharges decreased 4% compared to 2010 (-170 t). This decrease was due, for the largest part, to the shutdown of the Valencia unit in Venezuela (-320 t) of GBU Acetow, which ceased operation in May 2010.

The 2015 objective of decreasing VOC emissions by 20% over the current perimeter compared to 2005 has already been exceeded with the realization of 39% decrease.

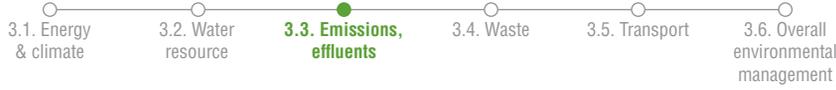
**Ozone Depletion Substances (ODS)**



The emissions in 2011, around 3 t, are on the same order of magnitude as those in 2010 after the sharp decrease in 2008 resulting from an investment in the Salindres site in France.

The Montreal Protocol of 1987 is an international agreement intended to reduce emissions of ozone depleting substances. It required the elimination of the use of CFCs and now targets other ODS, including HCFC which are longer be marketed as virgin products.

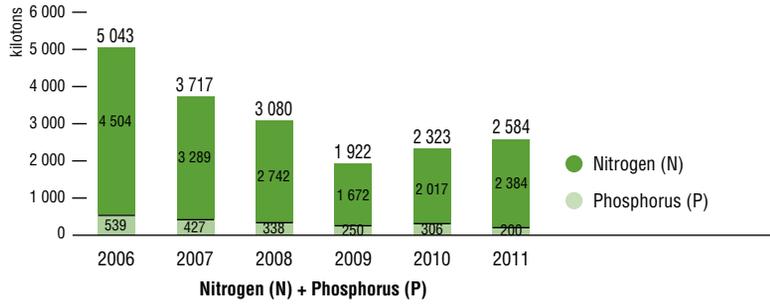
<sup>(1)</sup> Reference: ozonic potential of R11 = 1  
 Perimeter: equivalent to perimeter under operational control.  
 Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).



### 3.3.2. Emissions to water (GRI EN21)

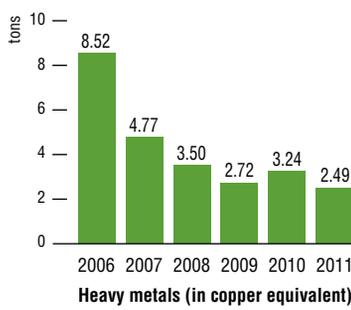
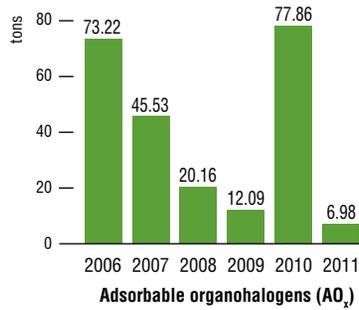
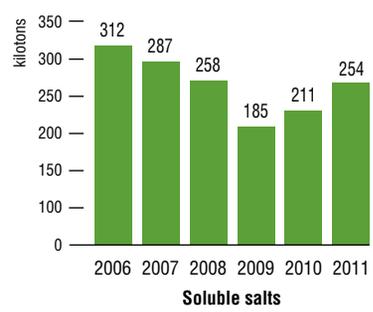
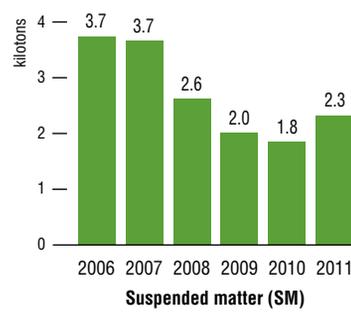
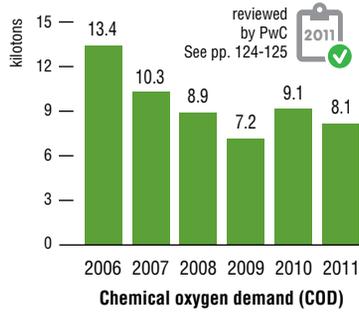
#### Eutrophication

2011 reviewed by PwC See pp. 124-125

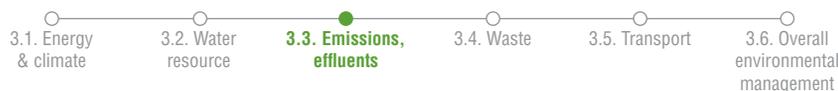


Perimeter: equivalent to perimeter under operational control.  
Data of prior years unchanged (date corresponding to the perimeter of Rhodia for the concerned year).

#### Additional specific parameters



Perimeter: equivalent to perimeter under operational control.  
Data of prior years unchanged (date corresponding to the perimeter of Rhodia for the concerned year).



### Nitrogen (N) + Phosphorus (P)

**Rhodia has committed to a program for nitrogen and phosphorus discharges causing eutrophication of waters, aimed to reduce emission by 20% between 2005 and 2010, a commitment that has since been renewed until 2015.**

In late 2011, the recorded decrease was 48% compared to 2005, achieved through reductions at source and the by setting up higher performance treatments.

In late 2011, the recorded decrease was 48% (N+P) compared to 2005, achieved through reductions at source and the by setting up higher performance treatments. In 2011, the decrease in emissions expressed in phosphorus was 35% compared to 2010 (-50 t linked to the Oldbury site of GBU Novacare located in England, due to a different product mix). For nitrogen the reduction at source (-200t) obtained at the Chalampé site ( France , GBU Polyamides intermediates ) was thwarted by the increase (+408 t) in discharges at the La Rochelle site ( France, GBU Rare Earth Systems) which faced serious fouling in its recovery unit for ammonium nitrate for agricultural uses.

So, in total, this indicator (N+P) showed an increase by 11% in 2011. So, in total, this indicator showed an increase by 11% in 2011.

### Chemical oxygen demand (COD)

Rhodia has set an objective of an absolute reduction of discharges (primarily organic materials) entailing increased oxygen demand, of 20% between 2005 and 2010.

This objective has been renewed for the 2010-2015 period.

With a 37% decrease compared to 2005, the objective of a 40% decrease by 2015 is almost achieved. This result was obtained by implementing numerous projects aimed at reduction at source or optimization of existing treatments designed by the experts in environmental R&D.

In 2010, the COD stemming from discharges by Rhodia declined by 11% as compared to 2010 (-1 030 t). The main contributions came from the Chalampé site in France due to improved control of discharges and to a drop in activity (-415 t) and from the Santo Andre Novacare site in Brazil with the separation of flows of concentrated organic matter for transfer to the outside treatment station (-700 t).

### Suspended matter (SM)

The Cincinnati site in the US and the Qingdao Chengyang site in China, reporting for the first time, contributed to the increase in suspended matter discharges in the amount of 200 t.

#### Soluble salts

Soluble salt discharges increased by 20% in 2011 compared to 2010 (+42 700 t). The new Qindao Changyang site of (China, GBU Silicas), started up in late 2010 and reporting for the first year, contributed heavily to the increase (+29 000 t).

#### Adsorbable organohalogen (AO<sub>x</sub>)

Discharges of adsorbable organic halogen compounds dropped drastically by 91% to 7 t in 2011 compared to 78 t in 2010 because of an improvement in process at the key contributing site in Salindres (France, GBU Aroma Performance).

#### Heavy metals

Heavy metal discharges, expressed in copper equivalents, remains at the same level as in previous years.



## 3.4. Waste

### 3.4.1. Waste (GRI EN22)

#### Breakdown of waste by category & incineration

	2006	2007	2008	2009	2010	2011
Waste incinerated by Rhodia - Tons	243 384	246 986	225 976	172 333	211 568	164 710
of which waste incinerated by Rhodia with valorization of the heat - Tons	174 487	177 736	153 219	114 637	145 019	95 283
Waste incinerated by third party - Tons	104 718	82 159	55 048	33 771	42 238	31 324
of which waste incinerated by third party with valorization of the heat - Tons	52 665	56 957	39 177	22 568	32 537	22 924
Incineration with valorization of the heat (internal & external) - Tons	65%	70%	68%	67%	70%	60%

Perimeter: equivalent to perimeter under operational control.

Data of prior years unchanged (date corresponding to the perimeter of Rhodia for the concerned year).

#### Breakdown of waste by category

Regarding waste, the policy of Rhodia is to implement the 3R approach (Reduce, Reuse, Recycle) which privileges reduction at source by maximizing reaction yields, over reuse (agricultural application) or over the material recycling or energy recovery. Teams of specialists in chemistry and chemical engineering

constantly improve the processes to make them cleaner and offer original routes for the recovery of waste and by-products (e.g. use as raw material for the manufacture of solvents with a lower impact on the environment).

#### Incineration

In 2011, 60% of the waste has been recovered with energy recovery.

This percentage has decreased in 2011 due to the drop by 50 kt of waste incinerated by Rhodia at its Chalampé site in France because of optimization of the process allowing for less by-products generated, of the increased material recovery of part of these by-products and a of general decline in overall activity compared to 2010.

#### Hazardous & non-hazardous waste

	2006	2007	2008	2009	2010	2011
Hazardous waste total - Tons	387 933	354 544	319 887	226 338	273 439	211 478
Non-hazardous waste total - Tons	74 211	78 665	81 386	69 207	69 923	80 078
<b>Total waste - Tons</b>	<b>462 144</b>	<b>433 209</b>	<b>401 273</b>	<b>295 595</b>	<b>343 362</b>	<b>291 556</b>

Data of prior years unchanged (date corresponding to the perimeter of Rhodia for the concerned year).



**Waste reuse & recycling - Sludge reuse in land farming**

	2006	2007	2008	2009	2010	2011
Waste reuse & recycling <sup>(1)</sup> - Tons	75 811	61 715	86 069	50 006	38 885	45 857
Sludge reuse in land farming - Tons	26 721	32 951	29 981	29 351	23 188	32 685

<sup>(1)</sup> Reuse of ammonium nitrate as fertilizer, of silica and silicate muds in cement; recycle of solvents, oil, and catalyst.

Perimeter: equivalent to perimeter under operational control.

Data of prior years unchanged (date corresponding to the perimeter of Rhodia for the concerned year).

**Waste reuse & recycling**

Beyond research to recycle its waste for energy recovery by the end disposal contractors, Rhodia sites also promote reuse and recycling (solvents and oils to be regenerated, catalysts to be recycled, ammonium nitrate as fertilizer, recycling of silica,

and silicate sludge in cement, etc.). Nearly 46 000 t of products were recovered in 2011 (material recovery, excluding energy recovery).

**Sludge reuse in land farming**

33 000 t of materials were spread in 2011, primarily from sludges

from water treatment stations, the properties of which comply with local regulations.

## 3.5. Transport

### 3.5.1. Accidents during transportation (GRI EN29)

	2008	2009	2010	2011
Number of accidents <sup>(1)</sup>	22	24	22	21

<sup>(1)</sup> Accidents classified as High and Medium severity.

Perimeter: equivalent to perimeter under operational control.

Data of prior years unchanged (data corresponding to the perimeter of Rhodia for the concerned year).

Transport accidents reported by Rhodia involve accidents occurring all along the logistics chain (from the shipping site to customers or to the disposal sites in the case of waste) and for raw materials when Rhodia is the charterer. Twenty-one accidents (two classified as High Severity and 19 as Medium Severity according to the CHML (Catastrophic, High, Medium, Low) of the Rhodia Care Management System (RCMS) management software) were reported in 2011. Analysis of these accidents shows that:

- 67% of accidents were still attributable to events occurring during transport: this is why information actions for carriers will be continued in 2012.

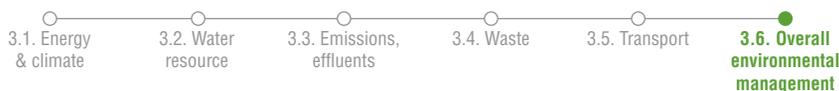
- 33% of accidents occurred during loading or unloading operations. This is why reminders of procedure are carried out at the sites to help eliminate these problems.

Rhodia pays very particular attention to the choice of its carriers, relying on the data from the European Chemical Industry Council (Cefic). Similarly, in the framework of Rhodia's Sustainable development approach, the Rhodia Purchasing department set up and spread a questionnaire for the assessment of suppliers regarding Sustainable development and Corporate Social responsibility (CSR), when selecting new suppliers. Finally, an annual performance evaluation process was instituted worldwide.

With regard to maritime and river transport of bulk liquid chemicals (and butadiene in gas form), Rhodia practices "vetting", ensuring checks in addition to those performed by flag States, ship-owners, and classification societies.

For maritime shipment of containers, isotanks and chemical tankers, Rhodia has established a vessel geolocation system. A real-time information system also permits rapid determination of the Rhodia products affected through identification of the containers in any accident, and the access to the necessary information for both the maritime Company and the response services.

Rhodia works with the emergency response service Carechem24, allowing any caller anywhere in the world to get a response and a technical advice in his/her language in case of an emergency, 24 hours a day, 7 days a week. The Carechem24, emergency information numbers are shown on the Safety Data Sheets as well as on the transport documents and the labeling.



## 3.6. Overall environmental management

Managing its health, safety, and environmental footprint is an important challenge for a chemical group and one in which Rhodia has invested heavily. Rhodia has reached a very high level of safety performance at its production facilities thanks to the continuous improvement of our management tools and processes. We have also managed, year on year, to incrementally reduce its gas, water, and waste emissions and their impact on the environment. In fact Rhodia have seen tangible progress across all of its environmental performance indicators this year because of constant efforts that began more than 20 years ago.

### 3.6.1. Environmental analysis & priority management

#### Follow-up on environmental analysis

	2006	2007	2008	2009	2010	2011
Realization of analysis of environmental aspects conducted or reviewed within less than 5 years	79%	90%	86%	87%	87%	91%

Perimeter: equivalent to perimeter under operational control.  
Current 2011 perimeter.

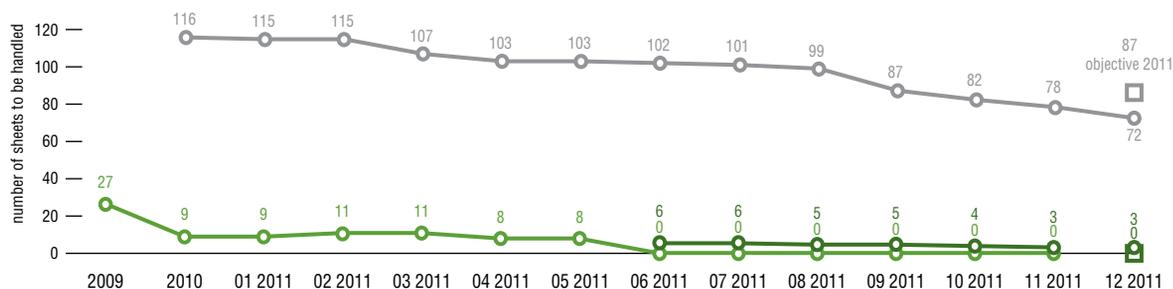
Analyses are based on a rigorous identification of the dangers and a precise evaluation of the risks and potential impacts of Rhodia's activities on the environment. In 2011, 91% of its installations had undergone an environmental study that had been performed, adapted, or reviewed within the past five years, compared to a rate of 87% in 2009 and 2010.

The environmental impact studies conducted by Rhodia showed the absence of significant environmental consequences resulting from its activity in 2011.

The ecotoxicity of aqueous effluents and IBGN and IBD type biotic indicators concerning the receiving environment involved have been measured at a number of sites

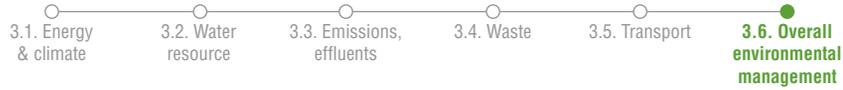
(particularly in France). This approach will be followed, in the context of the 2010-2015 plan, for all of the 22 sites that are not integrated into a sewage network shared with other industries or collectivities.

#### Management of environmental priority sheets (P1-P2)



Perimeter: equivalent to perimeter under operational control.  
Data 2011 on a historical basis.

- P2 sheets - base January 2011
- P1 with waivers signed by GBU
- P1 sheets older than 1 year excluding the waivers
- Target 2011 for P2 sheets
- Target excluding the waivers



Rhodia has developed for more than 20 years its own system for managing Safety, Environment, Health, Hygiene, Product and Transport safety, called RCMS (Rhodia Care Management System). This system was certified according to ISO 14001 standard. Each operational entity of Rhodia must perform an audit every three years. All actions and the establishment of the RCMS integrated management system contribute to achieving the objectives and targets set by Rhodia.

Regular site compliance studies are performed, resulting in corrective upgrades. Regulatory monitoring allows Rhodia to perform the necessary studies so as to comply with new requirements.

In addition to the environmental analysis conducted by the sites, permitting development of improvement plans, P1 and P2 files (1 & 2 action priorities) are being

set up with the objective of resolving detected anomalies or dysfunctions. The deviations, recorded in files, are classified according to three levels of priority of action (1: high, 2: medium, 3: low). The priority 1 deviation files must be resolved in less than one year after their identification/recording. The period is increased to two years for priority 2 files. Rhodia finished the 2011 year without a P1 file more than one year old (aside from 3 files with exceptions, for which action plans have been drawn up) and with 72 P2 files (for an objective of 87). Regarding this latter criterion, the objective is to have dealt with, by the end of 2014, all 116 P2 files present at the end of 2010, the date on which the elimination of P2 was entered into the environmental progress plan.

In 2007, reporting of accidents / incidents having an impact on the environment (loss of containment,

water, air, and ground discharges) was implemented worldwide and refined in early 2011.

All accidental environmental events are recorded and analyzed to avoid their recurrence. Rhodia tracks the number of these “accidents,” based on their severity:

Severity: C (Catastrophic), H (High), M (Medium), and L (Low). In 2011, an accidental discharge of some 10 kg of sulfur oxide required the temporary evacuation of a business located near the site and the intervention of outside assistance. This category H accident had no significant consequence (no injuries, no media coverage).

### 3.6.2. Health, safety, environment provisions (GRI 1.2)

Provisions for occupational diseases & accidents, environmental rehabilitation

	2006	2007	2008	2009	2010	2011
Occupational diseases & accidents - EUR million	1.9	1.9	2.5	2.6	2.2	1.6
Environmental rehabilitation - EUR million	205	203	196	239	271	293
<b>Total - EUR million</b>	<b>206.9</b>	<b>204.9</b>	<b>198.5</b>	<b>241.6</b>	<b>273.2</b>	<b>294.6</b>

*Perimeter: equivalent to perimeter under operational control.  
Allowances at end of fiscal year.*

#### Unjustified faults & environmental remediation

With regards to provisions for Occupational Diseases and Accidents, Rhodia makes provisions for inexcusable faults for cases related to its personnel and covers social liabilities related to cases of persons transferred in the context of divestments. Provisions have been stable at around 2 EUR million at the end of each fiscal year.

Regarding environmental provisions, Rhodia reflects within its financial accounts the amount of obligations identified and annual changes are related to the variation of these obligations, as well as the impact of accretion rates. 2011 also represents the alignment with Solvay accounting rules.



# 4. Human resources & labor practices

Social performance is a cornerstone of Rhodia’s competitiveness. These indicators are an essential part of the Rhodia’s Human Resources (HR) policy, which outlines how the HR function helps achieve the Company’s objectives while understanding employees’ needs. It illustrates Rhodia’s desire to continue developing employees’ skills through training and mobility. Throughout the world, open dialogue with employees and their representatives, together with processes which have now been widely implemented, have helped employees to embrace Rhodia’s culture of responsibility.

Rhodia’s skills development policy aims to anticipate the Company’s needs by job category and develop the skills of current employees. This data is supplemented by detailed knowledge of the skills acquired, or to be developed, by each employee and his/her desire for advancement.

The challenge of the mobility policy is to encourage in-house transfers of employees while capitalizing on local employees’ expertise and skills. Its implementation is based on coordinated international management of the different job categories.

## 4.1. Employment

As part of the launch of a new global Human Resources reporting tool in 2011, Rhodia clarified some of its core HR indicators which may explain some of variances in the following parameters as well as comparisons to previous years.

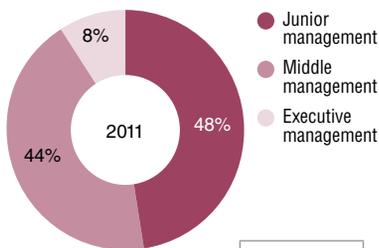
### 4.1.1. Employment by region (GRI LA1)



See 4.1.1. Employment by region, on p. 49

### 4.1.2. Distribution of managerial personnel by hierarchical level (GRI LA13)

Managers by job class (Hay system)



	2011
Junior management	1 619
Middle management	1 478
Executive management	283
<b>Total</b>	<b>3 380</b>

The Rhodia system of job classification for its management is based on the Hay system. Rhodia’s managerial population represents around 22.5% of all employees.

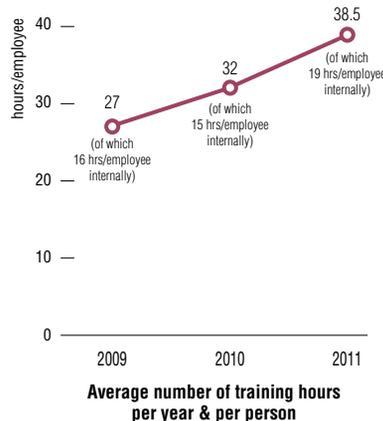
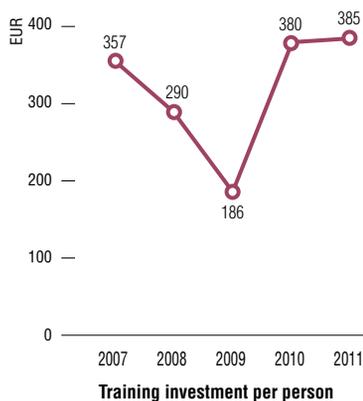
*Perimeter: Europe, Nafta, Mercosur and Asia-Pacific.*



## 4.2. Training & education

### 4.2.1. Learning & development - (GRI LA10)

All staff



In 2011, Rhodia maintained its effort at investing in training to meet its commitment of a minimum of 30 hours / employee on average.

This budget is dedicated to increasing the offering of training courses per country but also at a worldwide level, with deployment of programs intended to reinforce the operating excellence along strategic lines in the context of Rhodia's growth. Thus, in 2011:

- 135 key Account Managers took 2.5 day courses intended to reinforce their strategic dimension;
- 150 purchasing agents were trained in intercultural negotiation;
- 5 800 employees took the "acting responsibly" module intended to develop Rhodia's culture of responsibility.

On average, all employees took 38.5 hours of training, i.e., an increase of 20% over 2010.

89.7% of Rhodia's personnel were trained in 2011, an increase of four points compared to 2010.

In 2011, the proportion of non-managerial employees trained was greater than that of managers (91% of the non-managerial staff was trained versus 86% of the managers). The training intended for non-management was longer: 45.5 hours for non-managers, and 33.5 hours for a trained manager.

Rhodia choose to pursue its approach to the positioning of internal training as the primary mode of transmission and development of know-how in the organization. The outside training programs were thus reserved for the acquisition of new skills or the enrichment of internal programs.

Out of the 38.5 hours taken per employee in 2011, more than half were provided by a network of internal trainers, mobilized more particularly around occupational training.

	2009	2010	2011
Employees following at least a training per year	80%	85%	90%

	2011	
	Not mandatory	Mandatory
Average number of training hours per person	28.8	41.6
Employees trained in the given category	86%	91%



### 4.2.2. Training to Sustainable development

Training to Rhodia way

Rhodia has developed a specific training on Sustainability intended to strengthen the culture of responsibility of all employees. This training, called "Acting Responsibly" program, began at the end of 2009, with a special focus on the industrial population. Relying on a network

of in-house trainers, the program is currently being used in all the countries with a level of employees trained of 60%. The last Rhodia Way Awards, which promote the best sustainability projects, have rewarded 6 projects out of 240.

## 4.3. Diversity & equal opportunity

### 4.3.1. Diversity & equal opportunity (GRI LA13)

Gender, Hay system/job families, age, international mobility

#### Gender

Women & men repartition

	2011	
	Women	Men
In all personnel	23%	77%
In management	29%	71%

*Perimeter: Europe, Nafta, Mercosur and Asia-Pacific*

The average proportion of 23% of female employees hides significant variations per functional domains. While female employees are less represented in industrial functions,

they have a stronger presence in functional support areas (e.g. Human Resources, etc.) where they represent in some cases up to 60% or more of the staff.

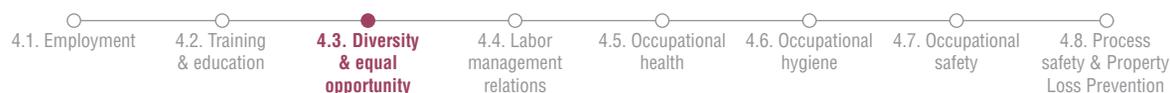
Rhodia is committed to encourage diversity among employees, to reinforce its multinational, multicultural, and multidisciplinary composition. Staff is recruited without any form of discrimination on the basis of job requirements (expertise and competencies) and the ability and willingness of candidates to adopt the underlying Rhodia's Values.

Equal opportunity - Women in management by job class (Hay system)

	2011	
	Count	Percentage
Junior management	597	17,7%
Middle management	345	10,2%
Executive management	37	1,1%
<b>Total women in management</b>	<b>979</b>	<b>29,0%</b>

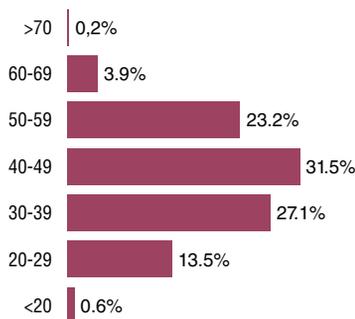
*Perimeter: Europe, Nafta, Mercosur and Asia-Pacific.*

Female employees represent 29% of the total population of managers. Since 2008, 2002 global job families have been implemented for all employees. These job families apply worldwide, providing standardized information about key responsibilities, competencies, and expertise required for each type of job. In some more technical position a "double ladder" policy has also been deployed (R&D, Industrial).



### Age pyramid

Rhodia population, 2011



As in many European companies, Rhodia's demography shows a mature profile that is ageing (27.3% of employees are more than 50 years old versus 14.1% less than 30 years old). Nevertheless with sustained growth and associated recruitments in Asia and Brazil, Rhodia ends 2011 with an average age of 42 years old.

Perimeter: Europe, Nafta, Mercosur and Asia-Pacific.

### Employee mobility - International mobility

Number of moves by GBU or function per year, 2011

	2011			
	MILD (*)	O+ (**)	STM	Total
Energy	-	1	2	3
Engineering plastics	3	3		6
Finance	-	1	2	3
Industrial	1	-	-	1
Information systems	2	-	3	5
International affairs	1	-	-	1
Novelcare	4	3	-	7
Polymers & intermediates	-	1	2	3
Purchasing	1	-	-	1
R&D	-	1	-	1
Rare earth systems	4	-	1	5
Silica	1	-	-	1
RBS	-	-	1	1
<b>Total</b>	<b>17</b>	<b>10</b>	<b>11</b>	<b>38</b>

Rhodia's strategy is to ensure that employees develop their skills and move across countries in order to avoid the creation of geographical and/or business silos. Such moves are decided on basis of a variety of elements such as the competences and the expertise of the person, his/her specific aspirations and the Company's needs.

(\*) MILD: Mission Internationale Longue Durée - Long-term International Assignment. The expatriation assignment consists of a long-term international experience of 18 months to 5 years. The terms and conditions include a "Home Country" option, which makes it possible to maintain a standard of living comparable to that of the home country.

(\*\*) "Opportunity +" allows Rhodia employees to go abroad more easily. It is a long-term international experience lasting 18 months to 5 years. The "Opportunity+" option offers employment and compensation conditions similar to those of a local employee. The local compensation follows the practices of the host country and, in principle, all of the compensation is paid in the host country. This policy is also offered to employees who have limited professional experience (3-5 years) to whom Rhodia offers a position in another country.



## 4.4. Labor management relations

### 4.4.1. Performance & development appraisal (GRI LA12)

Rhodia staff - Annual reviews

	2011	objective
Managerial staff	98%	100%
Non-managerial staff	70%	100%

In the service of projected jobs management, Rhodia's skill development policy is based on processes intended to identify the Group's needs by occupational family as early as possible. This data is supplemented by detailed knowledge of the skills acquired or to be developed by each of the employees and their desires regarding development.

The basic process in the development of employees is the Annual Performance and Development Interview (APD). 98% of Rhodia's managerial staff goes through this process. It is estimated

that approximately 70% of the non-managerial staff also go through this process. The long-term goal is to cover 100% of the personnel worldwide.

The APDI nourishes the process of managing the training and mobility of Rhodia. In effect, during this interview, the manager and employee perform an in-depth analysis of behavioral skills and techniques, to identify their strong points and tracks for improvement. This analysis allows them to reflect on professional development and determines the lines of development necessary to individual performance in the current

or future position. This development plan may be based on a panel of actions such as internal or outside coaching, participation in conventions or training actions. The individual training actions selected feed the training process. If professional development is envisioned, the employee will become part of Rhodia's process of career mobility and management.



## 4.5. Occupational health

For Rhodia, the health and safety of its employees is a priority. Providing good working conditions and managing risk are daily concerns for the Company. Since 2006 Rhodia has developed global safety frequency rates that include all of the people working on our sites. This step was taken to ensure that all people affected by Health, Safety, Environment (HSE) issues are treated uniformly.

### 4.5.1. Occupational diseases (GRI LA7)

Main types notified in Europe, NAFTA, Latin America, and Asia Pacific

	Asbestos benign pathologies			Hearing disorders			Musculo-skeletal disorders			Other non-carcinogenic diseases			Asbestos cancers			Malignant hemopathies			Other carcinogenic diseases			All diseases		
	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
Cases recognized or likely to be recognized as occupational diseases <sup>(*)</sup>	29	13	11	0	0	2	1	4	3	1	1	2	12	12	10	2	0	0	3	3	2	48	33	30

<sup>(\*)</sup> As defined in the Rhodia's internal procedure (DRC 28) on the process of occupational diseases management.

Perimeter: equivalent to perimeter under operational control.

In 2011, Rhodia identified 30 occupational diseases, recognized or subject to subsequent recognition<sup>(\*)</sup>, at all sites combined (compared to 48 in 2009 and 33 in 2010). With the exception of one pathology identified in Spain and two in England, all of them were identified in France. The great majority of these diseases result from past exposures, primarily to asbestos (67%), which took place prior to the creation of Rhodia. The latency periods for

asbestos-related pathologies are generally long between the first exposure and the first radio-clinical manifestations (most often between 30 and 40 years). In many cases, Rhodia is nonetheless assuming the consequences of these pathologies. For the past two years now, the number of work-related diseases has dropped significantly. This drop, linked to the decrease in "asbestos" pathologies in France, could be the

result of early actions taken since 1976 related to its substitution when possible and precautionary measures when substitution was not an option.

<sup>(\*)</sup> Recognized or subject to subsequent recognition, as defined in Rhodia's internal procedure (DRC 28) on the process of handling work-related diseases.



**4.5.2. Health prevention against Carcinogenic Mutagenic or Reprotoxic substances (GRI LA8)**

Programs follow-up on the use of Carcinogenic Mutagenic or Reprotoxic (CMR) substances at Rhodia sites

	2006	2007	2008	2009	2010	2011
Number of uses of CMRs on the sites - Categories CLP 1A & 1B, IARC 1 & 2a	607	510	540	637	641	612
Number of activities involved	720	740	862	1 084	1 112	1 113
% of evidence of non-replacement or redirected reinforcement	25%	67%	98%	98%	99%	99%
% of in-depth evaluations performed	27%	68%	98%	99%	99%	100%
% of CMR files created	24%	63%	98%	97%	99%	99%

*Perimeter: equivalent to perimeter under operational control. At the current perimeter as of the end of 2011.*

Rhodia has set up the Carcinogenic, Mutagenic, Reprotoxic (CMR) “red line”, a voluntary commitment throughout the world.

Since 2006, in relation to its defined “red line” described in its Management Book, Rhodia pursued a voluntary global process to limit CMR substances. In 2006 a specific procedure concerning CMR substances has been established. It involves all products brought to the market at the global level, whether they are CMR 1A or 1B according to the European Regulation CLP (Classification, Labeling, and Packaging of substances) or belonging to groups 1 and 2A according to classification of the International Agency for Research on Cancer (IARC). This “red line” laid out at all Rhodia sites require an inventory of Rhodia CMR products, systematic research of alternatives and adequate management and control of specific risks related to these substances.

At the end of December 2011, among all Rhodia sites, approximately 600 uses of CMR were declared, representing more than 140 CMR substances, used in pure form or in preparations, for which:

- 100% of risk evaluations were carried out;
- 99% of arguments for non-substitution were drafted;
- 99% of files were finalized, with a goal of 100% by the end of 2011.

In accordance to the “red line”, a series of CMR substances were replaced or eliminated in 2011.

In 2012, the “red line” will be extended to Substances of Very High Concern (SVHC). In addition to CMR substances, complying with the expanded definition of Rhodia, it will encompass Endocrine Disruptors (ED), and substances that are Persistent, Bioaccumulable, Toxic (PBT), and very Persistent and very Bioaccumulable (vPvB).

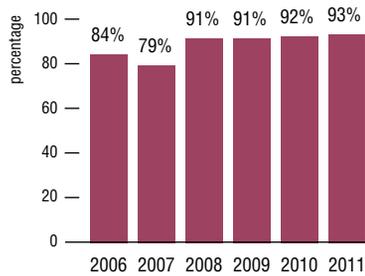
According to its Health and Safety policy, Rhodia asked all sites to carry out or update, at a minimum frequency of five years, an evaluation of the Health and Safety risks related to its personnel. These evaluations are undertaken through the application of Rhodia’s own worldwide guidelines, such as those related to the Critical Tasks Analysis, to the semi-quantitative or quantitative risks assessment. In 2011, 93% of functions had undergone such a risk assessment.



## 4.6. Occupational hygiene

### 4.6.1. Occupational risk assessment & health prevention (GRI LA8)

Functions assessed for health risks & safety since less than five years



Perimeter: equivalent to perimeter under operational control.  
At the current perimeter as of the end of 2011.

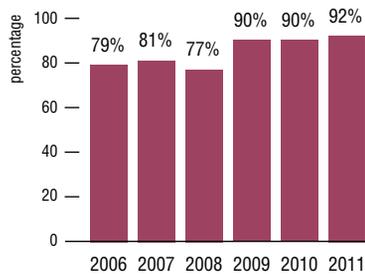
Through procedures and guidelines applicable to all sites, Rhodia asks every work station to undergo a health and safety risk assessment. Rhodia is currently working on developing two new guidelines, one related to the improvement of the design and maintenance of sanitation systems, and a methodological guideline to define the actions to be taken at each step of an investment project.

Rhodia has a Rhodia Occupational Exposure Limit Committee (ROEL) for many years, to define its own professional exposure limit values for certain products, applicable to all its sites throughout the world.

## 4.7. Occupational safety

### 4.7.1. Behavioral safety program (GRI LA8)

Employees involved in a progress campaign for safety<sup>(1)</sup>



<sup>(1)</sup> SS, IGP: Scheduled Overall Inspections, HOSF programs (Human and organization safety factors: "Vigilance program"), BBS: Behavioral Based Safety, STOP, or other risk evaluation process of the ATC type, suggestion box, Rhodia Way, etc.

Perimeter: equivalent to perimeter under operational control.  
At the current perimeter as of the end of 2011.

To promote the efficient implementation of safety related best practices, Rhodia has specific behavior-based methods.

In 2011, 91.6% of staff has been involved in progress activities regarding health, safety or the environment. The development of actions in the sphere of Human and Organizational Safety Factors (HOSF) with the deployment of the "VIGILANCE" program in France and with the hiring of an HOSF contact expert were two significant steps for Rhodia towards its desire to maintain its current safety performance levels.

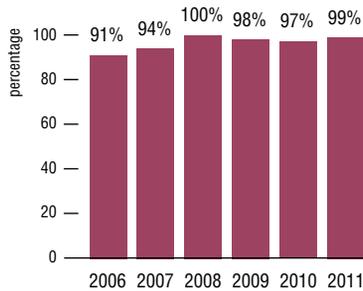
The STOP program based on Dupont approach consisting in preventive observation of safety in the workplace is implemented for the French sites and for all the management lines.

See 4.7.2. Management systems & audits, on p. 106.



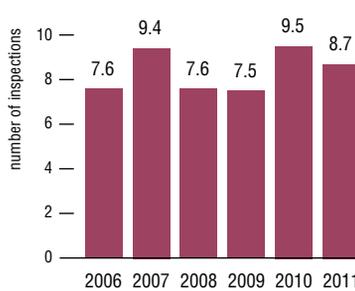
## 4.7.2. Management systems & audits

### Follow-up on HSEPT - Sites audits



Sites audited according to 3RHSE, SIMSER+ or RCMS frameworks within less than 3 years

### Management safety inspections



Safety inspections performed during the year by a member of the GBU Management Committee

Perimeter: equivalent to perimeter under operational control.  
At the current perimeter as of the end of 2011.

### A historic safety culture

Its culture of safety and its tradition of social dialog have placed Rhodia, and this goes back to its origins, as a cutting edge player in regards to Corporate Social Responsibility (CSR). Since the 1970s, a voluntary policy has been developed in the domains of hygiene, health, safety, products and transport, and environment that leads to the implementation of a frame of reference integrated into the overall management system: the Rhodia Care Management System (RCMS).

In 2011, this single frame of reference (which includes the requirements of the standards ISO 14001 and OSHAS 18001 and the primary international regulations), includes 115 requirements, stemming from the two prior frames of reference (SIMSER+ and 3RHSE) established by Rhodia. RCMS has been validated by the Executive Committee in order to be implemented worldwide. In line with the enterprise project objectives, RCMS now includes the evaluation of its implementation directly by operational managers. The fact that Hygiene, Security, Environment, Product stewardship, and Transport (HSEPT) principles are now applied on a day to day basis improves the sustainable performance in this area. Rhodia also had excellent performance in terms of Health, Safety, Environment (HSE) audits

with 98.6% of sites having been audited according to the adopted frameworks (3RHSE, SIMSER+ or RCMS) in the past three years.

**Drawing on the safety results and on the various useful returns on experience, Rhodia decided in 2011 to launch two programs intended to improve safety performance by addressing individual behaviors: the STOP and VIGILANCE programs.**

#### STOP

The STOP program (Safety in the Workplace through Preventive Observation) is based on the Dupont approach and methodology. This initiative is aimed at training all Rhodia managers of sites in France to an integrated and sustainable standard of preventive behavior observation, in order to:

- Strengthen knowledge and skills in safety management and integrate them into daily behavior.
- Strengthen the daily involvement in the field of supervisors in terms of incident prevention.
- Reduce at-risk situations and behavior through prevention.

#### VIGILANCE

The VIGILANCE program is currently being implemented at Rhodia sites in France. It allows increasing the

awareness of supervisory and operational staff to individual safety attitudes and to make operators better understand the factors influencing their behavior. Based on four individual values (discipline, cautiousness, responsibility, and recognition), this awareness is accompanied by the implementation at sites of four simple tools to stimulate concrete changes in safety culture. This program could be extended, in a second step, to other countries after adapting training modules and training local personnel to act as local “catalysts.” All of this would not be possible without a significant commitment from GBUs. The mobilization of Rhodia in the fields of health, safety and the environment also translates into a very concrete commitment of managers in the field. “Safety” visits by members of the Exco and by members of the Management Committee of Rhodia Companies, contribute to promoting awareness and to motivating teams. The average rate of safety visits per member of the Management Committees of GBUs was of 8.7 in 2011.



**4.7.3. Accidents of people at the Group’s sites (GRI LA7)**



See 4.7.3. Accidents of people at the Group’s sites, on p. 65

**4.7.4. Fatal accidents (GRI LA7)**



See 4.7.4. Fatal accidents, on p. 66

**4.7.5. Safety program for contractors (GRI LA8)**

The safety of personnel at their workplace is an everyday concern for Rhodia. The results, summarized in 4.7.3. Accidents of people at the Group’s sites, in Solvay section, bear witness of this fact. For many years, Rhodia published integrated safety results for all personnel working at sites throughout the world, whether for its own personnel, personnel from external companies or temporary personnel.

The improvement of safety results for contractors’ personnel is largely due to the selection of the companies working at Rhodia sites. For instance in France, these companies must be “Manuel d’Amélioration Sécurité des Entreprises” (MASE) certified. Their personnel must have received training and qualification in regards to chemical risks in order to work within the facilities. Furthermore, this personnel is trained at Rhodia

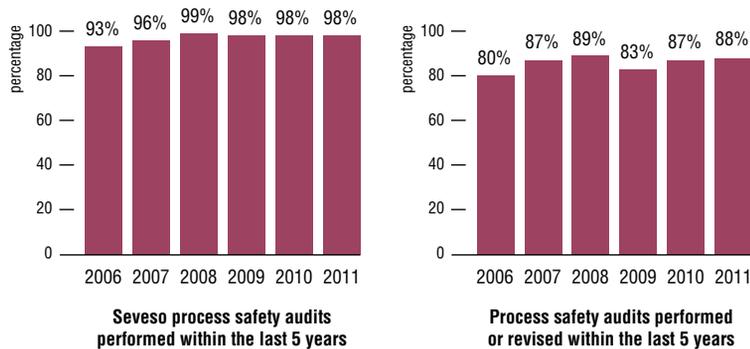
sites to make them aware of the risks inherent to its processes and products, and to risks inherent to the proximity of these processes and products with their own tasks.



## 4.8. Process safety & Property Loss Prevention

### 4.8.1. Process safety management at manufacturing sites

Solved level 1 risk sheets (unacceptable risk) within 12 months<sup>(\*)</sup>



<sup>(\*)</sup> Indicator based on the cumulative percentages of coverage of each plant.

In 2011 there was no unsolved level 1 risk sheets older than 12 months.

Control of Rhodia's industrial risks is based on a precise evaluation of existing risks. To this end, all installations undergo a safety audit. These extremely detailed "process safety" audits evaluate the potential risks connected with both products and processes and are reviewed every five years ("red line" in the Rhodia Management Book). Another "red line" requires every level 1 risk sheets to be handled within the next 12 months. In 2011 it was decided that the risk sheets related to intermediate but desasters risk (2 CD) should also be solved within 12 months and that this rule should apply as soon as 2011. This program relies on a network of process safety experts, supported by process managers who are responsible for validating the transition from one

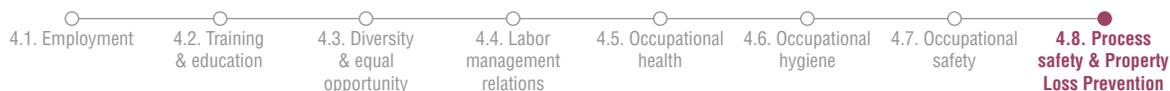
phase to another of projects both in respect to production and safety. The purpose of these procedures is to analyze the prevention and protection measures required for all sites and installations and analyze all the processes in action in order to evaluate the risks by detecting the key parameters.

The goal is to perform or review a safety audit for each installation suited to these risks at least every five years.

Process safety risk analysis has been conducted for 88% of the installations in the past five years. For Seveso sites or similar installations (for countries outside the European Union) a coverage rate of 98% is achieved.

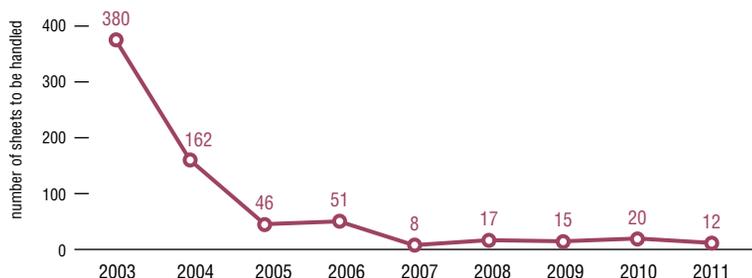
Furthermore, as of December 31, 2011, Rhodia identified in its reporting 27 "top or bottom tier" Seveso or

similar sites worldwide (including 12 in Europe) likely to present risks for the health or safety of neighboring populations and for the environment due to dangers of explosion or emissions of hazardous products.



### 4.8.2. Protecting assets & business continuity

Tracking of process safety audits



Perimeter: equivalent to perimeter under operational control.  
At the current perimeter as of the end of 2011.

#### Protecting assets

In process safety matters, Rhodia, in conformity with its commitment to Responsible Care® progress, intends to design, develop, and operate its manufacturing practices to master the risks, that is, to prevent accidents and to master the possible consequences with regard to personnel, populations living in the vicinity and the environment. The essential requirement therefore is to master the risks associated with technically plausible scenarios derived from the research into plausible causes of accidents according to Rhodia's risk analysis methods.

The methods selected must be adapted to the risks presented by each installation. Respect for the rules of the art, the application of regulations in effect and risk analyses should permit risks to be reduced by appropriate prevention and/or protection measures. Risk levels (1, 2 or 3) are selected according

to the levels of severity of the consequences and the probability of occurrence of each scenario. The risk assessment files where the residual risk is of level 1 (unacceptable risk) and those assessed as 2C (intermediate but disastrous risk) must be reported into Rhodia's Responsible Care® Balance Sheet (BRC).

The feedback from process accidents, shared within Rhodia each month in the Responsible Care® letter, also contributes to the global awareness of the sites managers.

This feedback is subject to analysis and discussion at team meetings at the production units each month, in conformity with Rhodia Care Management System (RCMS) management software.

The graph shows the efforts made by Rhodia to reduce its unacceptable risk files, thus improving the safety of its processes. The five years safety review audit planning was conducted

in the four zones, in application of the "red line" related to this field. There was no record of a risk 1 file older than one year. 2011 also saw the handling of risk two Cd files, and Rhodia ended 2011 with achieving its objective.

#### Business continuity

Rhodia, after having set up a plan for continuation of activity in case of a flu pandemic, is gradually establishing continuation of activity plans in case of flood, hurricane, earthquake, or sandstorm, for example, wherever necessary.



# 5. Society

## 5.1. Technology development

### 5.1.1. Innovation management

Open innovation (partnerships) & patents

#### Partnerships

	2009	2010	2011
Intellectual Property (IP) agreements	649	620	674

In 2011, in a context of open innovation and co-development, Rhodia strengthened its contacts and partnerships with labs and start-ups in the renewable raw materials fields, in biomass as an energy source, recycling, chemical recovery of CO<sub>2</sub> and materials of the future, particularly super-performing composites to replace metals.

Rhodia's innovation strategy is based on numerous outside scientific collaborations, particularly in the four Mixed Research Units (MRU) set up in France, the US, and China. The Eco-efficient Products and Processes

lab, dedicated to green chemistry, is collaboration between Rhodia, the National Scientific Research Center (FR), the Higher Normal School of Lyon, (FR) and the East Centre Normal University (CN) that was inaugurated on November 4, 2011, in Shanghai.

The Rhodia teams are also engaged in some fifty collaborative research projects, including new partnerships set up within the framework of French Government initiatives promoting industries of the future. These new projects will, in particular, explore chemistry based on plant oils (the

Pivert project) and the development of processes ever more respectful of the environment (the IDEEL project).

All the long-term research projects in Rhodia are intended to develop solutions and technologies in harmony with the requirements of production and responsible consumption by customers.

#### Patents

	2011
Patents	123

Rhodia filed 123 patents in 2011 and was listed by Thomson Reuters as among the "Top 100 Innovators," a classification based particularly on the number of patents, their geographic distribution and their rate of citation by third parties.

### 5.1.2. Sustainable innovation

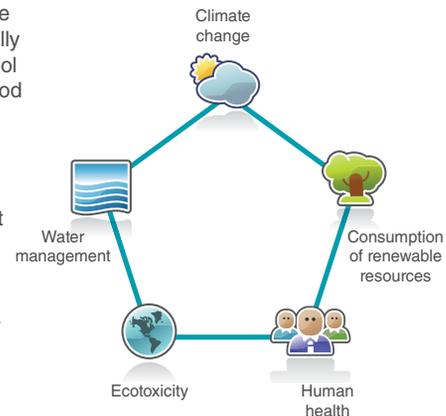
#### Lifecycle assessment (LCA)

Rhodia has built an integrated method for assessing the environmental impact of products developed within innovation projects. This method relies on an eco-design tool: the Sustainability Index, also developed by Rhodia. This methodology and the structure of the Sustainable Index tool have been reviewed by PwC.

This tool is specially designed to be able to follow the evolution of knowledge gained as the project progresses. From the earliest steps of the innovation process, the Sustainability Index delivers, on a multi-criteria basis, key features of the environmental impact of the future product: CO<sub>2</sub> footprint, consumption of non-renewable

resources, impacts on human health and eco-system quality as well as water footprint, and provides recommendations for orientating the project towards more environmentally friendly solutions. The use of this tool is a founding element of Rhodia good practices for project management: evaluation by the Sustainability Index is a deliverable for project phase crossings. Moreover, such an assessment all along the project progress provides strong roots for a full lifecycle assessment, that can then be submitted to a critical review in respect of the ISO 14040-44 standards, for supporting new product promotion.

**Rhodia puts the protection of human health and the environment at the very heart of its innovation projects and processes.**



## 5.2. Education & culture

### Rhodia, a Company actively involved in its communities

Working through its Rhodia Way approach, the Company forges relationships with its local communities based on an ongoing dialogue and open communications and it supports, whenever possible, opportunities to promote local solidarity. Rhodia encourages the initiatives taken by its GBUs, sites and employees to help the disadvantaged, to support the training and professional integration of young people, to protect the environment, etc.

#### 5.2.1. Corporate philanthropy & charities

- In 2007, the first corporate foundation was created, the Instituto Rhodia, in Brazil. This institution, which works as an independent organization, pursues social and environmental projects at national level: Alquimia Jovem (“Young Alchemists”) and Sustainable Schools.
- In Asia, the Rhodia Energy GBU teamed up with the Albatross Association and launched a societal project in 2011 aimed at stimulating the awareness of local school children about the need to protect the environment.

- In addition, within the framework of the Rhodia Way Awards, the winning French, Russian, Chinese, and Brazilian teams donated their 10 000 EUR prizes to local associations chosen in liaison with the Corporate Sustainable development Department. In France for example, Rhodia is reintroducing endemic species on a disused site it owns not far from the Lyon R&D center. The prize-winning Russian Serpukhov site has made a donation to the local orphanage for the purchase of a medical imaging scanner for gastroenterological diagnoses.

In China, the Purchasing Team, working in partnership with the Greenovate association, organized training for Rhodia employees who volunteered to work with school children in Shanghai in order to sensitize them about the importance of environmental protection. The initiative has been carried out in two stages: in Qingdao, on May 5, 20 volunteers from Rhodia – who had previously been trained by Greenovate – met up with almost 200 Chinese middle-school students in order to teach them about, and to organize games devoted to, issues related to the environment, energy,



and carbon emissions. The same event was staged in Shanghai, on May 28, where the meeting was organized under the scope of the Rhodia Open Day. Young middle-school students were given the opportunity to tour the R&D Center on the Rhodia site and to gain a more concrete idea about the Rhodia's approach to Sustainable development.

Another project in China: the R&D team have dedicated the Rhodia Way prize to support the association Colors of China, which since 1998 has established an education program for girls of ethnic minorities in Guangxi province (CN). Through this partnership Rhodia sponsors particularly the education of children in this region. Today over 5 000 children, including more than 4 500 girls, have had access to education or continue their studies thanks to the association Colors of China.

- In line with its Rhodia Way approach, Rhodia Corporate has also concluded two partnerships recognized in France (with France Active) and abroad (with Planet Finance). The Rhone Alpes French zone and China are two strategic focus territories for Rhodia. Those two partnerships run on a two years period and are financing through microfinance which is a societal commitment to Sustainable development DNA:

**- Planet Finance Project 2 Tongwei "From Isolation to Rural Market Integration"**

Deployment in China: 100 k EUR allocated in 2011: 65 k EUR and 35 k EUR in 2012.

Rhodia is the first private funder of the project. The European Community funds up to 75%. The project aims to increase access to renewable energy through micro-credit to local farmers in eight villages, and promote environmental protection among farmers in the County Tongwei. One of the major project is the creation and facilitation and management of a Centre of Rural Innovation. This center of knowledge and technological agricultural training on renewable energy will notably enhance the farmer as a major player in the supply chain. The financial partnership with Rhodia allows Planet Finance to develop and equip the Innovation Center, and then implement the necessary Human Resources for its coordination (training, events, visits, etc).

**- France Active: support the creation of enterprise worn by people suffering exclusion**

Deployment in 2011/2012: France - Rhone Alpes. Rhodia finances 50 k EUR to 12 projects of entrepreneurship, their support and financial assistance to the Guarantee Fund (bank loan guarantees made for 50 to 65% of bank loan for a project called "micro-credit guaranteed"). Rhone France Active Fund was established in 1993. In 2010, 230 creative projects (individual and collective) were supported by the Fund Rhone, allowing the creation of 464 jobs over the year. The survival rate recorded was 78% at three years (at the Supreme National Avg 50%). France Active association

was founded in 1988 in a context of increasing unemployment to act for the employment of people in difficulty. Several founders were at the initiative of its creation: the Fondation de France, the Deposit and Consignment Office, Credit Cooperative, the Macif Foundation and charities. The Association creates progressively France Active network consists today of 40 independent local associations Fund (territorial) but sharing common values.

## 5.3. Awards & recognition

### 5.3.1. Awards & recognition (GRI 2.10)

#### **Rhodia wins the Responsible Governance Award**

Rhodia has received in October 2011 the “Responsible Governance Award” in the SBF 120 category at a ceremony organized during the national week of Socially Responsible Investment. The award-giving ceremony was officially opened by Nathalie Kosciusko-Morizet, Minister for Ecology, Sustainable development, Transportation and Housing in the French government. Presented jointly by the Forum for Responsible Investment (Forum pour l’Investissement Responsable – FIR) and the Vigeo social rating agency, this award recognizes companies that have been most successful in making the principles and demands of Corporate Social Responsibility (CSR) an integral part of their corporate governance system.

#### **Vigeo research: Rhodia is one of the top 3 most socially responsible European companies**

Vigeo, the social rating agency, published in November 2011 its research findings on the social responsibility of European companies as far as non-discriminatory practices in employment are concerned. The agency analyzed the performance of 539 listed European companies with respect to non-discriminatory practices in employment on the basis of criteria such as the access and continued participation in employment of the most vulnerable members

of society, improvement in working conditions, training, professional advancement, etc. The result is high marks for French companies as a whole, with PSA Peugeot Citroën and Rhodia ranking just after the German E.ON AG in the top 3 industrial Groups. This excellent ranking illustrates once again the high degree of responsibility assumed by Rhodia through its agreement with ICEM.

#### **Chemistry innovation prize in favor of Sustainable development**

Rhodia was awarded the 2011 Pierre Potier Prize for Eolys Powerflex™. A catalytic additive for particulate filters first launched in December 2009, this new product helps carmakers to reduce the environmental impact of their vehicles. When added to the diesel (or biodiesel) fuel, it enables the particulate filter to function effectively and reliably. This technology, which is already used to equip 1.5 million diesel-driven vehicles in Europe, makes it possible to eliminate more than 99% of the carbon soot released by these vehicles. The production process used also makes it possible to reduce energy consumption by 35% and to recycle all the different co-products. Used in conjunction with a detergent, the engine’s efficiency is maintained throughout the life of the vehicle and the CO<sub>2</sub> emissions produced during the regeneration of the filter are reduced by a factor of 4%.

#### **Rhodia Way® Awards: awards designed to motivate**

Rewarding the best Sustainable development practices is a tradition at Rhodia. Created in 2008, the Rhodia Way® Awards recognize the best practices in the field that are in line with the commitments promoted by the Rhodia Way® Framework.

2010/2011 assessment: 240 projects submitted / More than 2000 employees involved worldwide, from the GBUs and functions / 107 projects selected as finalists / 6 prize winners.

# 6. Product responsibility

## 6.1. Regulations related to products

A key part of Rhodia's approach to product stewardship is the management of Health, Safety and Environment throughout the product lifecycle, from design through to end of life. For each product, a Safety Data Sheet (SDS) is available which provides information on health, safety, environment, and transportation.

### 6.1.1. Product information - REACH & GHS / CLP implementation

Rhodia dossiers

#### Dossiers registered for the first REACH registration phase, 2010

	Number of dossiers	Number of dossiers as Lead Registrant	REACH dossiers submitted to ECHA by 30.11.2010	Dossiers accepted by ECHA
Total	106	35	100%	100%

Perimeter: equivalent to European perimeter.

For Rhodia, 106 REACH dossiers which represented 85 different substances have been submitted and approved by the European Chemicals Agency (ECHA) by November 30, 2010. Rhodia were Lead Registrants (LR) for 35 among 85 substances.

#### Dossiers scheduled for the second REACH registration phase, 2013

	Number of dossiers	Number of dossiers as Lead Registrant	ELINCS to be updated in 2011 - 2012	ELINCS updated in 2011
Total	128	46	9	7

Perimeter: equivalent to European perimeter.

For the second 2013 registration phase within REACH, Rhodia has to manage currently 128 dossiers for 126 substances. Rhodia has a leader role for 27 substances and registers alone for 19 substances. In 2011, seven ELINCS European (List

of Notified Chemical Substances) dossiers have been updated and five EINECS (European Inventory of Existing Commercial chemical Substances) new registration dossiers have been made.

### 6.1.2. Product safety information

Number of commercial products managed in SAP-EHS

	2011
All business areas	16
Engineering plastics	1 274
Novelcare	3 418
Polyamide intermediates	1 845
Silica systems	215
Diphenols	431
Salicylics	114
Fluoro-organics	365
Rare earth systems	1 763
Fibras	35
COATIS	185
Tow	19
Corporate R&D	3
Rhodia interco	526
<b>Total</b>	<b>10 217</b>

In 2011, Rhodia emphasized the quality of communication of risk management measures towards customers through the translation of REACH safety datasheets into the languages of its European customers. The REACH Regulation is perceived by Rhodia as a real opportunity to get closer to its customers and to better anticipate their expectations or constraints in terms of use of the products marketed.

Rhodia also transposed the labeling data of the standardized Globally Harmonized System (GHS) classification from the United Nations program, broken down according to national standards for Brazil, China, Korea, Japan, and all countries in Southeast Asia. The processes and EHS database established by Rhodia thus permits the countries outside the REACH zone to benefit from any “relevant” information or data on dangers generated within the framework of Rhodia’s REACH project.

Moreover, Rhodia continues to pursue the actions that will allow it to meet the requirements of the next REACH deadline in 2013.

The number of commercial products managed in SAP-EHS enabling Safety Data Sheet (SDS) generation with GHS classifications (CLP Regulation in Europe, GHS Brazil, GHS China, GHS Korea, GHS Japan) or DPD and transport classification in 27 languages with GHS labels generation (transport included) represents about 45% of the overall commercial products portfolio.

Perimeter: equivalent to European perimeter.

### 6.1.3. Carcinogenic, Mutagenic or Reprotoxic (CMR) substances

	2004	2005	2006	2007	2008	2009	2010	2011
CMR substances put on the market	20	8	5	7	7	7	7	6

Perimeter: equivalent to perimeter under operational control.

The CMR “red line”, a voluntary commitment of Rhodia throughout the world.

In relation to its Management Book, Rhodia implemented in 2006 a specific procedure regarding Carcinogenic, Mutagenic, Reprotoxic (CMR) substances for all products brought to market. Rhodia thus defined its own CMR classification rules to be used globally at its sites, with definitions that may vary from one country or one continent to the other. A Rhodia CMR complies with CMR classification 1A and 1B of the European Union (CLP Regulation)

and the classification of the International Agency for Research on Cancer (IARC) for groups 1 and 2A.

This “red line” implemented at all sites of the group requires:

- An inventory of CMR products matching Rhodia CMR definitions;
- A systematic search for alternatives;
- And control of risks related to these products.

Year after year, replacement studies or even decisions to stop selling products are undertaken. Over seven years, they allowed Rhodia to decrease from 20 to 6 the CMR

substances (one substance removed from inventory in 2011, after a project to improve procedures and to process impurities).

In 2012, Rhodia anticipates expanding this CMR “red line” to Substances of Very High Concern (SVHC).



## 6.2. Sustainable consumption

### 6.2.1. Ecoprofile methodology

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See 5.1.2. Sustainable innovation on p. 111

Addendum

Addendum

Addendum



# Addendum

## Energy, greenhouse gas, and environmental emissions monitoring and reporting. Definitions and assumptions for **Solvay Chemicals & Plastics** (not covering Solvay Rhodia)



Note de dossier TRP 2011.5003,  
K. Vermeiren and M. Tyblewski,  
18.11.2011

NOTICE TRP 2011-111  
J.-P. Perrot 22-12-2011

### Definition of indicators for energy

The energy consumption has three components:

- Steam purchased;
- Electricity purchased;
- Primary fuels (coal, gas, fuel oil, etc.). The primary fuels purchased are used:
  - To produce internally steam and electricity;
  - In manufacturing processes (coke in lime kiln / gas in pyrolysis...).

These three components are converted in primary energy, in order to get the total energy consumption in Gigajoules (GJ), with the following conventions:

- Steam purchased: 2.9 GJ/t and 90% boiler efficiency;
- Electricity purchased: (IEA source) 3.6 GJ/MWh and 39.5% generation efficiency in average of all types of power production.

### Definition of indicators for greenhouse gases (GHG) (Scope 1 + 2)

GHG are defined as the six gases defined in the Kyoto Protocol and converted in CO<sub>2</sub> equivalent using their respective Global Warming Potential (GWP) potential (as defined by the Kyoto Protocol): CO<sub>2</sub> / N<sub>2</sub>O / CH<sub>4</sub> / SF<sub>6</sub> / HFCs / PFCs.

Taking into account:

- The direct emissions for each GHG released from Solvay's industrial activities (Scope 1 of Kyoto Protocol);
- The indirect emissions of CO<sub>2</sub> linked with the steam and electricity purchased (Scope 2 of Kyoto Protocol);
- Convention adopted for emissions related to acquired electricity: the emission factor specified in the supply contract or the one of the power supplier if it is not defined in the contract. In case of no publication by the power supplier, the national mix production per country is applied.

### Definition of indicators used to monitor environmental emissions

#### Two global emission indexes (Global Air Emission Index, Global Water Emission Index).

The Global Air and Global Water Indexes have been used by Solvay since 1993. In the absence of internationally recognized global indicators, they have been constructed by Solvay to reflect overall progress taking into account all pollutants emissions that are relevant for Solvay. They are calculated as the total weighted sum of all of the emissions of these pollutants. The used weighting factors are the inverse values of the reporting thresholds quantities set by

the European Pollutant Release and Transfer Register (E-PRTR)<sup>(1)</sup>. The reporting thresholds are indirectly linked to the intrinsic toxicity of each substance included in the indexes.

<sup>(1)</sup> Except for CO<sub>2</sub>, Volatile Organic Compounds (VOC), chlorides.

Five other impact indicators are used to assess the environmental impact of Solvay's manufacturing activities: climate change, ozone depletion, photochemical ozone creation, eutrophication, and acidification. These impact indicators are internationally recognized in particular by Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization (WMO), SETAC-UNEP.

Solvay has chosen to combine these five impact indicators with its two Global Indexes in order to communicate its overall environmental performance and assess the progress made, this in the absence of internationally recognized weighting factors reflecting the toxicity and eco-toxicity of substances necessary to build recognized toxicity indexes.

More specific emission parameters such as Volatile Organic Compounds (VOC), Chemical Oxygen Demand (COD), dust emissions, heavy metals... are also used and reported.

Key Performance Indicators (KPI's) are used internally to monitor the



main Solvay productions. For the production of PVC, for example, a set of indicators is computed and followed. These are expressed as relative (i.e. per ton of PVC produced) consumptions and/or emissions. These KPI's are used to benchmark individual Solvay plants with Best Available Technique (BAT) - AEL (BAT Associated Emission Levels), described in Europe's BAT Reference ("BREF") documents or voluntary commitments (e.g. the PVC Charters of the European, Council of Vinyl Manufacturers (ECVM) or the Vinyl 2010 Commitment).

### Targets for overall reduction of environmental emissions

During the strategic review of 2008 of its sustainability objectives, Solvay set clear targets in particular in terms of energy consumption, GHG emissions, and emissions in air and water: "20% reduction by 2020 compared to the performance of the year 2006 at constant perimeter".

### Reference year 2006 for the -20% objectives

The reference year 2006 for the -20% objectives (for emissions to air, emissions to water, energy consumptions, and greenhouse gas emissions) was selected because the Board made this decision beginning 2008, when the last well established figures were those of 2006.

### Perimeter of activities consolidated in the energy and environmental reporting

The perimeter covers all sites with manufacturing activities (i.e. all significant emissions and/or significant energy consumptions)

for environmental emissions (73 manufacturing sites in 2010), and all energy-intensive sites for energy (62 manufacturing sites in 2011).

The perimeter encompasses all entities in which the Group has a majority stake or is responsible for the operational – technical management.

### Comparison to 2006 at constant perimeter: coping with the changing perimeter of the Solvay group

The performance is communicated in absolute figures and in % in comparison to reference 2006 "at constant perimeter" after corrections each year to take into account the changes in the Group's activities.

The perimeter of the Solvay group indeed changes over time: new sites are being added, activities are sold or stopped, plants are decommissioned. In order to monitor changes/progress, it is necessary to take these changes of perimeter into account. The following conventions are used.

#### Transfers of operations and acquisitions

Newly acquired plants are subject to environmental reporting not later than two years of full integration into the Solvay group (adoption of its monitoring and reporting programs). For energy consumptions, the process is as described follows:

If, after a transfer of operations or acquisition of an activity, a site meets the inclusion criteria, it is included in the reporting perimeter as of the 1st January following a six months period starting at the date the criteria are met. In other words, if a site meets the inclusion criteria before the 1st July, it is included as of the 1st January of the following year, but if the inclusion criteria is met later, the site is included as of the 1st January of the second year following the

date of status change. This delay is necessary to inform all the concerned persons involved in the reporting process, to implement the needed measures and to check if it works correctly.

To allow comparisons to the reference 2006, the 2006 reference figures for these sites must be defined and added to the Group's 2006 reference:

- If available, the 2006 data of the acquired activity (and subsequent years) are used;
- If these data are not available, the Solvay 2006 average for this type of activity (if available) is used as reference for 2006 for the acquired activity;
- In case of activities for which no Solvay reference exists, a case by case approach is used.

#### Closed or sold activities

Emissions by sold activities / sites are removed from the reporting in absolute figures at the date of their session. These will also be removed from the reference 2006 for the calculation of progress "at constant perimeter":

- Sold activities are removed from the reference 2006 and all subsequent years, both for energy/emissions indicators and production volumes;
- Closed activities are maintained in the reference 2006 (and in the reporting of subsequent years) both for energy/emissions indicators and production volumes.

#### Taking into account changing activity volumes in the calculation of progress of operations

Progress "at constant perimeter" takes into account the change of activity volumes of existing operations. "Progress at constant activity perimeter" is based on comparisons of emissions or energy consumptions with their baseline for a given year.



The base of comparison (to assess progress at constant perimeter for a given year Y) is defined as the performance of year Y (energy consumptions or environmental emissions) that would have been expected with activity volumes of year Y but with performance (environmental or energy efficiency) of the reference year 2006.

Thus, the baseline is the energy consumptions/emissions that would have occurred with the level of performance of the reference 2006.

- For energy / CO<sub>2</sub>, a baseline for year Y is first calculated for each final product, by multiplying the quantity produced during year Y by the 2006 specific consumptions / emissions for this product. The specific energy consumption / CO<sub>2</sub> emission used as reference is the weighted average of all specific energy consumptions / CO<sub>2</sub> emissions related to that product at all Solvay sites included in the perimeter and that produce that product. The coefficients to calculate the weighted average are,

for each site, the total production of that product during the base year. The total production of one product is equal to the quantity of that product which is exported outside the perimeter boundary and the quantity of that product which is consumed within the perimeter boundary. The global baseline is then obtained by adding all individual baselines for each final product.

- For environmental emissions, a baseline is first calculated only for each of the key final product of a given site (because environmental emissions cannot be allocated to each product as precisely as for energy consumptions). To reflect the change in production volumes from one year to the other, only a limited number of productions are used. For example, for a site producing PVC, the baseline is calculated as explained above, but using the quantity of vinyl chloride volumes as the reference product representative for PVC.

Activity	Reference product representative of the activity volume
Soda-Ash	Sodium carbonate
Vinyls	Vinyl chloride monomer
EDS	Chlorine
Peroxides	Hydrogen peroxide
Fluor	Sum of the production volumes of all sites / compounds
AFM	Precipitated calcium carbonate
Specialty Polymers	Sum of the production volumes of all sites / compounds



## Reporting boundaries for Solvay Chemicals & Plastics reporting (not covering Solvay Rhodia)

The boundaries of the reporting do not correspond to that of the financial reporting. For most of the parameters, the perimeter corresponds to all entities under operational control of Solvay. The consolidation of data and their publication are still evolving. For some of these indicators, the covered scope is only a part of the overall Group. Nevertheless, they are aimed at reasonably reflecting its overall performance.

Additional information about boundaries can be found in the legend of the figures. The rationale is to cover the most pertinent perimeter, in line with the materiality requirements of the Global Reporting Initiative (GRI) guidelines. Data are sometimes not available for previous years or for a given parameter. They are then supplied to the best of Solvay's knowledge and in function of the capabilities of the existing reporting systems.

- The quantitative data for environmental emissions cover all the manufacturing sites that are fully owned or operated by Solvay (69 active manufacturing sites and 4 inactive but still Solvay property, in 2011) and exclude the sites operated by the joint venture PipeLife and Inergy;
- The quantitative data for energy (and CO<sub>2</sub> emissions associated to energy) cover the energy intensive sites that are fully owned or operated by Solvay (62 manufacturing sites in 2011);
- The quantitative data relating to safety performance cover the fully owned manufacturing and key administrative sites as well as the sites of the joint venture PipeLife;
- The quantitative data relating to human resources generally cover all entities, including the joint ventures, where Solvay has a majority shareholding in Europe, Nafta, and Mercosur, with some exceptions. A number of entities are not covered yet in the consolidation of the data in Eastern & Northern Europe. In Asia and Africa, blue collars are generally not included (except for headcount where data are available).

Remark: the boundaries of the previous years correspond to Solvay's perimeter of activity at that time. When Solvay has taken commitments to progress "at constant activity perimeter", data are corrected for the changes in Group's perimeter and/or production volumes for each year.



## Assurance reports

**Solvay Chemicals and Plastics** external verification for energy, greenhouse gas, and environmental emissions

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 Bedrijfsrevisoren  
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**Limited Assurance Report on a selection of Energy and Environmental indicators of the Solvay Group**

Upon your request and in our capacity as independent auditor, we conducted procedures in order to provide limited assurance that the selection of Energy and Environmental indicators for the financial year 2011, marked with the sign  in the performance indicators' tables on pages 56 and 57 of the Annual Report (the « Indicators »), were prepared in all material respects, in accordance with the 2011 reporting protocol (hereafter referred to as the « Reporting Protocol »). The Reporting Protocol consist of specific instructions and procedures of the Solvay Group that are summarized in a document added to the Annual Report, called « Sustainability Indicators 2011 », in the annex section, called « Energy, Greenhouse gases and environmental emissions monitoring and reporting - Definitions and assumptions for the Solvay Group » from pages 121 to 123.

Our report does not cover any information, qualitative or quantitative, relating to Rhodia. Accordingly all references to "Group" in this assurance report, refer to Solvay excluding Rhodia.

**Management's Responsibility**

The Solvay Group's management is responsible to prepare the Indicators and the Reporting Protocol and to ensure this information is available and reliable.

**The Auditor's Responsibility**

It is our responsibility, based on our limited assurance review procedures, to express a conclusion regarding the indicators. We conducted our procedures in accordance with the international standard as defined in ISAE 3000 (International Standard for Assurance Engagements). With respect to independence rules, these are defined by the respective legal and regulatory texts as well as by our professional code of ethics.

Our review was designed to obtain a limited level of assurance and, as such, does not provide all the evidence that would be required to provide a reasonable level of assurance.

**Nature and scope of the procedures**

We performed the following procedures to be able to express our conclusion:

- We assessed the Reporting Protocol with respect to its reliability, understandability, neutrality, completeness and relevance, as related to the Group's activities and the sector's reporting practices.
- At Group level, we conducted interviews with those responsible for the reporting on Energy and Environment, more precisely with the Centers of Competence - Energy and HSE, to verify whether the procedures used to obtain, consolidate and control data, had been correctly applied. At this level, we have implemented analytical procedures and verified, on a test basis, the calculations and the consolidation of data.
- We selected a sample of five production sites in Brazil (Curitiba), Bulgaria (Devnya), France (Tavaux), Thailand (Map Ta Phut), and the US (Thorofare) on the basis of their activity, their contribution to the Group's consolidated data, and their location. At this level, we conducted on-site interviews with those responsible for obtaining and consolidating data at an intermediate level to verify if they understood and correctly applied the Reporting Protocol and verified, on a test basis, calculations and reconciliation with supporting documents.
- We reviewed the presentation of the indicators for the financial year 2011, marked with the sign  in the performance indicators' tables on pages 56 and 57, and the associated notes on methodology.

On average, our tests covered 26% for CO<sub>2</sub> emissions, 26% for energy consumption, 20% for GAEI, 8% for GWEI, 11% for POCP, 22% for ODP, 22% for AP and 21% for EP, 18% for water consumption and 22% for waste. We believe that our review provides a sufficient basis for our conclusion set out below.

Société civile ayant emprunté la forme d'une société coopérative à responsabilité limitée  
 Burgerlijke vennootschap die de rechtsvorm van een coöperatieve vennootschap met beperkte aansprakelijkheid heeft aangenomen  
 RPM Bruxelles - RPR Brussel - T.V.A. - B.T.W. BE 0446.334.71  
 Banque - Fortis - Bank 210-0909900-69




**Information or explanations**

**Relevance**

- The Group publishes information that covers the sector's main environmental and energy-related challenges. In particular, the Group seeks to provide environmental impact indicators and provides information on a comparable basis as described on pages 56 and 57 of the Annual Report and in the document added to the Annual Report, called « Sustainability indicators 2011 ».

**Completeness**

- When obtaining information, the Group tries to cover all its production activities. Rules for including sites in the Energy or Environment reporting scope have been clarified this year in the methodological note in the appendix of the document added to the Annual Report, called « Energy, Greenhouse gases and environmental emissions monitoring and reporting - Definitions and assumptions for the Solvay Group » (the « methodological note »).
- Efforts have been made this year to ensure a more complete and homogeneous reporting of environmental parameters at site level. The Group introduced monitoring guidelines for six of its business units, indicating the relevant pollutants to be measured as well as the recommended measurement frequency and method. During our site audits and review of the consolidation, we noted that those guidelines were not yet fully applied by the sites. This results in uncertainty about the completeness of the environmental reporting indicators that could not be sufficiently mitigated by alternative review procedures.

**Neutrality and objectivity**

- The Group offers detailed information on the methodologies it applied in order to define the indicators as mentioned in the methodological note.

**Reliability**

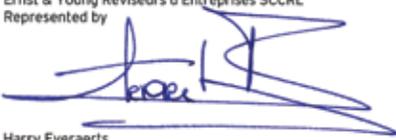
- For the Environmental indicators, internal controls on the calculation tools and consolidated data should be strengthened, notably for global indices and impact indicators.

**Conclusion**

Based on our review and our procedures with respect to the financial year 2011, and except for the uncertainty as noted above, nothing has come to our attention that causes us to believe that the indicators were not implemented and calculated, in all material respects, in accordance with the Reporting Protocol.

Diegem, 19 March 2012

Ernst & Young Réviseurs d'Entreprises SCCRL  
Represented by



Harry Everaerts  
Partner

12HEV0065

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## Solvay Rhodia external verification for environmental parameters: greenhouse gas emissions and other emissions



### REVIEW REPORT BY ONE OF THE STATUTORY AUDITORS ON A SELECTION OF ENVIRONMENTAL INDICATORS PUBLISHED IN THE "SUSTAINABILITY INDICATORS 2011" DOCUMENT FOR THE RHODIA SECTOR OF THE SOLVAY GROUP

Patrick Cléret  
Rhodia SA  
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20 rue Marcel Sembat  
69191 Saint Fons

Further to your request and in our capacity as Statutory Auditor of Rhodia SA, we have carried out a review for the purpose of enabling us to express moderate assurance on a selection of environmental indicators listed below, based on historical Group structure for 2011 (all sites that belonged to Rhodia in 2011) and presented in section 3. – Environmental Performance, of the "Sustainability Indicators 2011" document for the Rhodia sector of the Solvay group:

- Air: greenhouse gases expressed in CO<sub>2</sub> equivalent, acidification (nitrogen and sulphur oxides) and tropospheric ozone (volatile organic compounds – VOC);
- Water: water withdrawals, eutrophication (nitrogen and phosphorus) and damage to the aquatic environment (chemical oxygen demand – COD).

The data are prepared under the responsibility of Rhodia SA's Senior Management in accordance with the Responsible Care reporting procedures for the Rhodia sector of the Solvay group (DRC 06 and the related glossary, DRC 06-01), which are available for consultation at Rhodia SA's corporate headquarters.

Our responsibility is to express a conclusion on the data based on our review.

#### Nature and scope of our work

We conducted our work in accordance with professional standards applicable in France.

We carried out the procedures described below to obtain moderate assurance that no material irregularities exist with regard to the data. We did not perform all of the procedures required to obtain reasonable assurance (a higher level of assurance).

Moreover, in addition to the request made by Rhodia in the framework of the implementation by Rhodia of the 3E method, assessing the environmental impact of products developed within innovation projects (see section 5.1.2. of the "Sustainability Indicators 2011" document), we conducted a peer review of the methodology developed by Rhodia and the structure of the Sustainable Index tools, and made recommendations based on our findings.

Concerning the selected indicators, our work was conducted at corporate headquarters and at five major sites worldwide, representing four operating units of the Rhodia sector, selected on the basis of 2010 data. These units were major contributors to environmental indicators or sites that had not been visited in previous years:

- Chalampé, France;
- Baltimore, United States;
- Marcus Hook, United States;
- Baton Rouge, United States;
- Santo André, Brazil.

Our work was conducted between December 2011 and the end of January 2012.

Environmental data for the units visited cover, for each indicator, the following percentages of the total figures published by the Rhodia sector:

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T: +33 (0) 1 56 57 58 59, F: +33 (0) 1 56 57 58 60, [www.pwc.fr](http://www.pwc.fr)

Société d'exercice comptable inscrite au tableau de l'ordre de Paris - Ile de France. Société de commissariat aux comptes membre de la compagnie régionale de Versailles. Société Anonyme au capital de 2 510 400 €. Siège social: 63, rue de Villiers 92208 Neuilly-sur-Seine. RCS Nanterre 472 006 483. TVA n° FR 75 472 006 483. Siret 472 006 483 0002. Code APE 6920 Z. Bureaux: Bordeaux, Grenoble, Lille, Lyon, Marseille, Metz, Nantes, Nice, Paris, Poitiers, Rennes, Rouen, Strasbourg, Toulouse.



**Rhodia SA**

*Review report by one of the Statutory Auditors on a selection of environmental indicators published in the “Sustainability Indicators 2011” document for the Rhodia sector of the Solvay group*

Greenhouse gases (CO <sub>2</sub> equivalent, after elimination of intra-Group transfers) 2011	29%
Acidification (nitrogen and sulphur oxide emissions) 2011	38%
Tropospheric ozone (VOC emissions) 2011	35%
Water withdrawals 2011	53%
Eutrophication (nitrogen and phosphorus emissions) 2011	39%
Damage to the aquatic environment (COD emissions) 2011	40%

*At corporate headquarters and prior to the site visits:*

- We assessed the reporting procedures in terms of their relevance, reliability, objectivity and understandability.

*During site visits:*

- We checked that the Rhodia sector’s reporting rules were properly applied, particularly the definitions relating to the Responsible Care indicators within the scope of this report.
- Concerning environmental indicators:
  - o We reviewed the calculation methods used to determine Responsible Care reporting data, in particular for consistency and reliability;
  - o We compared, on a test basis, the data entered in the reporting system by the operating units with information obtained from a wide range of sources (including self-assessments, reports prepared for government agencies, reports by outside organizations drawn up in the context of local regulations, internal control documents, invoices and management reporting data);
  - o We performed an analytic review of the raw data used to calculate the 2011 indicators, compared with data from the previous year;
  - o Where discrepancies were identified, we determined the correct value based on discussions with the operating unit and the Corporate Responsible Care team, and checked that the necessary adjustments had been made in the operating unit’s reporting datasheet.

*After the site visits, at corporate headquarters:*

- For the sites visited:
  - o We checked that the data reviewed for the operating units visited had been properly included in the consolidated data produced by the reporting managers in the Corporate Responsible Care Department.
- For the sites that were not visited:
  - o We reviewed, on a test basis, the work carried out by the reporting managers to follow-up and explain the discrepancies between 2010 and 2011 data;
  - o We reviewed, on a test basis, the consistency checks made by the reporting managers;
  - o We reviewed, on a test basis, the significant corrections made by non-visited sites after discussions with the reporting managers.

We were assisted in our work by experts from our Sustainable Development Department.

**Conclusion**

Based on our work, no material irregularities came to light causing us to believe that environmental data described in the first paragraph of this review report do not comply, in all material respects, with the Responsible Care reporting procedures applicable in 2011 for the Rhodia sector of the Solvay group.

Neuilly-sur-Seine, March 20, 2012

The Statutory Auditor  
PricewaterhouseCoopers Audit

Stéphane Bassot  
Partner

Sylvain Lambert  
Partner of PricewaterhouseCoopers Advisory



# GRI index

Index according to the Global Reporting Initiative's G3.1 Guidelines



See: [www.solvay.com/EN/Sustainability/sustainabilityreporting/GlobalReportingInitiative.asp](http://www.solvay.com/EN/Sustainability/sustainabilityreporting/GlobalReportingInitiative.asp)

GRI CLASSIFICATION						
Aspects		Reference	Basic indicators	Correspondance to Global Compact Principles  See the table of concordance with the principles of the UNGC on p. 136	Indicators	
STRATEGY & PROFILE	STRATEGY & ANALYSIS	1.1	•	Ongoing commitment to the GC	Chairman's Statement	
		1.2		Ongoing commitment to the GC	Key impacts, risks, and opportunities	
	PROFILE OF THE ORGANIZATION	2.1		No specific COP requirement	Company name	
		2.2		No specific COP requirement	Principal brands, products, and services	
		2.3		No specific COP requirement	Operational structure	
		2.4		No specific COP requirement	Location of head office (headquarters)	
		2.6		No specific COP requirement	Nature of ownership and legal form	
		2.8		No specific COP requirement	Company size	
		2.9		No specific COP requirement	Significant changes in the reporting period	
	REPORT PARAMETERS	Report profile	2.10		No specific COP requirement	Awards received in the reporting period
			3.1		No specific COP requirement	Reporting period
			3.2		No specific COP requirement	Date of previous report
			3.3		No specific COP requirement	Reporting cycle
Report scope and boundary		3.4		No specific COP requirement	Contact persons	
		3.5		No specific COP requirement	Process for defining report content, materiality, and priority	
		3.6		No specific COP requirement	Boundary of the report	
	3.7		No specific COP requirement	Any limitations on the boundaries of the report		
	3.8		No specific COP requirement	Basis for reporting on joint-ventures		
	3.9		No specific COP requirement	Data-measurement techniques and bases for the calculation of quantitative data		
		3.10		No specific COP requirement	Explanation of the consequences of any changes in the boundaries of the report	
		3.11		No specific COP requirement	Consequences of the changes in boundaries	
	GRI content index	3.12		No specific COP requirement	Location of required information in the report	
	Assurance	3.13		No specific COP requirement	External validation by independent bodies	

▷ Gaps in numbering are due to indicators that are not included, because they are irrelevant for our activities or not available.



SOLVAY CHEMICALS & PLASTICS			SOLVAY RHODIA	
SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011	TOWARDS SUSTAINABLE DEVELOPMENT 2008-2012 (*)	SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011
	p. 2-3	p. 2-3		
	p. 147-159	p. 6-11, p. 16	p. 97	p. 147-159
Cover	Cover	2 <sup>nd</sup> of cover		
p. 21	Flap cover, p. 21, p. 29	2 <sup>nd</sup> of cover	p. 21	Flap cover, p. 37
	p. 161-170	Flap cover		p. 161-170
p. 138, Back cover	Back cover	Back cover		Back cover
	p. 65, p. 144			p. 65, p. 144
p. 27, p. 49	Flap cover	Insite front cover		Flap cover
		p. 77		
p. 76-77			p. 113	
Cover, p. 4		Flap cover		Cover, p. 4
p. 4		Flap cover		
Cover, p. 4, p. 121		Flap cover		
p. 139		Back cover		
p. 4-5, p. 10		p. 8-9, p. 16		
p. 4-5, p. 121		Flap cover, p. 82		
p. 4-5, p. 121		Flap cover		
p. 4-5, p. 121		Flap cover, p. 61, p. 82		
p. 118-119, indicators sections		p. 82 (*)		
p. 17, p. 19, p. 85, p. 118-120		p. 78 (*)		
p. 17, p. 19, p. 85, p. 118-121		p. 78 (*)		
p. 126-135		p. 86-87		p. 126-135
p. 4, p. 19, p. 29, p. 31, p. 34, p. 38, p. 39, p. 42, p. 122-123	p. 56-57	Flap cover (*)	p. 4, p. 85, p. 88, p. 89, p. 92, p. 124-125	p. 56-57

(\*) Examples or partial information relating to the GRI guidelines.



GRI CLASSIFICATION					
Aspects		Reference	Basic indicators	Correspondance to Global Compact Principles	Indicators
				 See the table of concordance with the principles of the UNGC on p. 136	
<b>STRATEGY &amp; PROFILE</b>	<b>GOVERNANCE, COMMITMENTS, AND ENGAGEMENTS</b>	Governance	4.1	Actions taken to implement Principles 1-10	Governance structure
			4.2	Actions taken to implement Principles 1-10	Chairman's independence from the Board of Directors
			4.3	Actions taken to implement Principles 1-10	Independence of the members of the Board of Directors
			4.4	Actions taken to implement Principles 1-10	Mechanisms for shareholders and employees to provide recommendations or instructions to the Board of Directors
			4.5	Actions taken to implement Principles 1-10	Link between the organization's performance & remuneration for the board members, senior managers, and executives
			4.6	Actions taken to implement Principles 1-10	Processes introduced by the Board of Directors to ensure conflicts of interest are avoided
			4.7	• Actions taken to implement Principles 1-10	Assessment of the qualifications and expertise of members of the Board of Directors for guiding in economic, social, and environmental matters
			4.8	Actions taken to implement Principles 1-10	Mission, values, and codes of conduct; and their implementation
			4.9	Actions taken to implement Principles 1-10	Procedures for overseeing the Company's approach to challenges and its policies on sustainable development
			4.10	Actions taken to implement Principles 1-10	Assessment of the Board of Directors' own performance in relation to sustainable development
	Commitment to external initiatives	4.11	Actions taken to implement Principle 7	Position regarding the precautionary principle and its application	
		4.12	Actions taken to implement Principles 1-10	Adherence to charters, principles and other external initiatives	
		4.13	Actions taken to implement Principles 1-10	Membership of associations, including trade bodies	
	Stakeholders engagement (dialogue)	4.14	Sharing the COP with the Company's Stakeholders	Stakeholders group considered	
		4.15	Sharing the COP with the Company's Stakeholders	Basis for identification of stakeholders	
		4.16	Sharing the COP with the Company's Stakeholders	Approaches to dialogue with the stakeholders	
		4.17	Sharing the COP with the Company's Stakeholders	Stakeholders' concerns	
<b>ECONOMIC</b>	Economic performance	EC1	• No specific COP requirement	Economic value generated and distributed	
		EC2	• Actions taken to implement Principle 7	Financial implications, risks and opportunities due to climate change	
		EC3	• No specific COP requirement	Coverage of the organization's defined benefit plan obligations	
	Market presence	EC5	Outcomes from implementing Principle 1	Range of ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation	
		EC6	• No specific COP requirement	Policy, practices and proportion of spending with locally-based suppliers	
		EC7	• Actions taken and outcomes from implementing principle 6	Procedures for local hiring, proportion of senior management recruited locally	
	Indirect economic impacts	EC8	• No specific COP requirement	Involvement in developing infrastructure and services benefiting society as a whole	
		EC9	No specific COP requirement	Understanding and describing significant indirect economic impacts, including the extent of impacts	

> Gaps in numbering are due to indicators that are not included, because they are irrelevant for our activities or not available.



SOLVAY CHEMICALS & PLASTICS			SOLVAY RHODIA	
SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011	TOWARDS SUSTAINABLE DEVELOPMENT 2008-2012 (*)	SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011
	p. 179-207	p. 18 (*)		p. 179-207
	p. 186-199			p. 186-199
	p. 188			
	p. 202-207			p. 202-207
	p. 204-206			p. 204-206
	p. 186			
	p. 187-202			p. 189
p. 23		p. 5, p. 64		
p. 7		Flap cover, p. 24		
Not reported	Not reported	Not reported	Not reported	Not reported
p. 4, p. 8		p. 22 (*), p. 46, p. 48		
		p. 18, p. 88		
		p. 17, p. 82, etc.		
p. 7, p. 10-11		p. 8-9	p. 12-13	
p. 7, p. 10-11		p. 8-9	p. 12-13	
p. 7, p. 10-11, p. 14, p. 25-26, p. 55, p. 77		p. 17, p. 31, p. 45, p. 59, p. 75, p. 82, p. 83		
p. 7, p. 10-11		Flap cover, p. 7, p. 15, p. 29, p. 43, p. 57, p. 73		
p. 69	p. 55	p. 83		
(Report via CDP project (**))		p. 20, 26-27, 34-35		
		p. 65, p. 66 (*)		
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
p. 69		p. 83		

(\*) Examples or partial information relating to the GRI guidelines.  
 (\*\*) CDP = Carbon Disclosure Project



GRI CLASSIFICATION						
Aspects		Reference	Basic indicators	Correspondance to Global Compact Principles	Indicators	
				 See the table of concordance with the principles of the UNGC on p. 136		
<b>ENVIRONMENTAL</b>	Materials	EN1	•	Outcomes from implementing Principle 8	Materials used by weight or volume (Materials consumed)	
		EN2	•	Outcomes from implementing Principles 8 and 9	% of materials used that are recycled input materials (Materials recycled)	
	Energy	EN3	•	Outcomes from implementing Principle 8	Direct energy consumption by primary energy source	
		EN4	•	Outcomes from implementing Principle 8	Indirect energy consumption by primary source	
		EN5		Outcomes from implementing Principles 8 and 9	Energy save due to conservation and efficiency improvements (Energy savings)	
		EN6		Actions taken to implement Principles 8 and 9	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives (Use of renewable forms of energy)	
	Water	EN8	•	Outcomes from implementing Principle 8	Total water withdrawal by source	
		EN10		Outcomes from implementing Principles 8 and 9	% and total volume of water recycled and reused	
	Biodiversity	EN11	•	Outcomes from implementing Principle 8	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas. (land areas used, and effects on biodiversity)	
		EN12	•	Outcomes from implementing Principle 8	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	
		EN13		Outcomes from implementing Principle 8	Habitats protected restored	
	Emissions, Effluents, and Waste	EN16	•	Outcomes from implementing Principle 8	Total direct and indirect greenhouse gas emissions by weight	
		EN17	•	Outcomes from implementing Principle 8	Other relevant indirect greenhouse gas emissions by weight	
		EN18		Actions taken and outcomes from implementing principles 7, 8 and 9	Initiatives to reduce greenhous gas emissions and reductions achieved	
		EN19	•	Outcomes from implementing Principle 8	Emissions of ozone-depleting substances by weight	
		EN20	•	Outcomes from implementing Principle 8	NO,SO, and other significant air emissions by type and weight	
		EN21	•	Outcomes from implementing Principle 8	Total water discharge by quality and destination	
		EN22	•	Outcomes from implementing Principle 8	Total weight of waste by type and disposal method	
		EN23	•	Outcomes from implementing Principle 8	Total number and volume of significant spills	
		EN24		Outcomes from implementing Principle 8	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I,II,III, and VIII, and percentage of transported waste shipped internationally	
		Products & services	EN26	•	Actions taken to implement Principles 7, 8 and 9	Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation
			EN27	•	Outcomes from implementing Principles 8 and 9	% of products sold and their packaging materials that are reclaimed by category
	Compliance	EN28	•	Outcomes from implementing Principle 8	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	
	Transport	EN29		Outcomes from implementing Principle 8	Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce	
	Overall	EN30		Actions taken and outcomes from implementing principles 7, 8 and 9	Total environmental protection expenditures and investments by type	

▷ Gaps in numbering are due to indicators that are not included, because they are irrelevant for our activities or not available.



SOLVAY CHEMICALS & PLASTICS			SOLVAY RHODIA	
SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011	TOWARDS SUSTAINABLE DEVELOPMENT 2008-2012 <sup>(*)</sup>	SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011
Not reported	Not reported	Not reported	Not reported	Not reported
p. 42, p. 81-82		p. 33 <sup>(*)</sup>		
p. 29-30	p. 56	p. 34-35	p. 87	p. 56
p. 29-30	p. 56		p. 87	p. 56
p. 29-30		p. 34-35		
p. 30		p. 26-27, p. 34		
p. 34-35			p. 89	
Not reported	Not reported	Not reported	Not reported	Not reported
p. 36				
p. 36		p. 79 <sup>(*)</sup>		
p. 36		p. 79 <sup>(*)</sup>		
p. 31-32	p. 56	p. 34	p. 88	p. 56
		p. 34	p. 88	p. 56
p. 48		p. 26-27, p. 34-35		
p. 39-40	p. 57	p. 34	p. 90-91	
p. 36-38, p. 40-41	p. 57	p. 78	p. 90-91	
p. 42		p. 78	p. 92-93	
p. 42-43			p. 94-95	
		p. 76 <sup>(*)</sup>		
Not reported	Not reported	Not reported	Not reported	Not reported
		p. 32, p. 47, p. 50, p. 51 etc.		
		p. 44, p. 52-53 <sup>(*)</sup>		
p. 44				
p. 33, p. 46		p. 33 <sup>(*)</sup>	p. 95	
Not reported	Not reported	Not reported	Not reported	Not reported

<sup>(\*)</sup> Examples or partial information relating to the GRI guidelines.



GRI CLASSIFICATION						
Aspects	Reference	Basic indicators	Correspondance to Global Compact Principles		Indicators	
			See the table of concordance with the principles of the UNGC on p. 136			
<b>SOCIAL</b>	Employment	LA1	•	No specific COP requirement	Total workforce by employment type, employment contract, and region, broken down by gender	
		LA2	•	Outcomes from implementing Principles 6	Total number and rate of new employee hires and employee turnover by age group, gender, and region	
		LA4	•	Outcomes from implementing Principles 3	% of employees covered by collective bargaining agreements	
	Labor/Management relations	LA6	•	Outcomes from implementing Principle 1	% of total workforce represented in formal joint management-worker health and safety committees that help monitor and advice on occupational health and safety programs	
		LA7	•	Outcomes from implementing Principle 1	Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	
		LA8	•	Actions taken to implement Principle 1	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases	
	Occupational health & safety	LA10	•	No specific COP requirement	Average hours of training per year per employee by gender, and by employee category	
		LA11	•	No specific COP requirement	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	
		LA12	•	No specific COP requirement	% of employees receiving regular performance and career development reviews, by gender	
	Training & education	LA13	•	Outcomes from implementing Principle 1 & 6	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	
	Diversity & equal opportunity	LA14	•	Outcomes from implementing Principle 1 & 6	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	
	Equal remuneration for women and men	<b>HUMAN RIGHTS</b>	HR1	•	Outcomes from implementing principles 1, 2, 3, 4, 5, and 6	% and HC of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening
	Investment and procurement practices		HR2	•	Actions taken and outcomes from implementing Principles 1, 2, 3, 4, 5 and 6	% of significant suppliers, contractors, and other business partners that have undergone human rights screening, and actions taken
			HR3	•	Outcomes from implementing principles 1, 2, 3, 4, 5, and 6	Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained
Non-discrimination			HR4	•	Actions taken and outcomes from implementing Principles 1, 2 and 3	Total number of incidents of discrimination and corrective actions taken
Freedom of association and collective bargaining	HR5		•	Actions taken to implement Principles 1, 2 and 3	Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights	
Child labor	HR6		•	Actions taken to implement Principles 1, 2 and 5	Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	
Forced and compulsory labor	HR7		•	Actions taken to implement Principles 1, 2 and 4	Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor	

▷ Gaps in numbering are due to indicators that are not included, because they are irrelevant for our activities or not available.



SOLVAY CHEMICALS & PLASTICS			SOLVAY RHODIA	
				
SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011	TOWARDS SUSTAINABLE DEVELOPMENT 2008-2012 (*)	SUSTAINABILITY INDICATORS PROGRESS REPORT 2011	SOLVAY ANNUAL REPORT 2011
p. 49	Flap cover, p. 15	p. 66 (*)	p. 49	Flap cover, p. 15
		p. 67 (*)		
		p. 67 (*)		
Not reported	Not reported	Not reported	Not reported	Not reported
p. 60, p. 65-66	p. 55	p. 60-62	p. 65-66, p. 103	p. 55
p. 61-63, p. 66		p. 61	p. 104-105, p. 107	
p. 50-51			p. 99	
		p. 65-66		
p. 57		p. 64 (*)	p. 102	
p. 50, p. 53-54		p. 65 (*)	p. 98, p. 100-101	
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
		p. 64 (*)		
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
		p. 67		
		p. 64 (*)		
		p. 64 (*)		

(\*) Examples or partial information relating to the GRI guidelines.



GRI CLASSIFICATION						
Aspects	Reference	Basic indicators	Correspondance to Global Compact Principles  See the table of concordance with the principles of the UNGC on p. 136	Indicators		
				Indicators	Indicators	
<b>SOCIAL</b>	<b>HUMAN RIGHTS</b>	Security practices	HR8	•	Outcomes from implementing Principles 1 and 2	% of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations
		Indigenous rights	HR9	•	Actions taken and outcomes from implementing Principles 1 and 2	Total number of incidents of violations involving rights of indigenous people and actions taken
		Assessment	HR10	•		% & HC of operations that have been subject to human rights reviews and/or impact assessments
		Remediation	HR11	•		Number of grievances related to human rights filed, addressed and resolved through formal grievance mechanisms
	<b>SOCIETY</b>	Local communi- ties	S01	•	No specific COP requirement	% of operations with implemented local community engagement, impact assessments, and development programs
			S10	•		Prevention and mitigation measures implemented in operations with significant potential or actual negative impacts on local communities
		Corruption	S02	•	Outcomes from implementing Principle 10	% & HC of business units analyzed for risks related to corruption
			S03	•	Outcomes from implementing Principle 10	% of employees trained in organization's anti-corruption policies and procedures
			S04	•	Actions from implementing Principle 10	Actions taken in response to incidents of corruption
		Public policy	S05	•	Actions taken to implement Principles 1 - 10	Public policy positions and participation in public policy development and lobbying
			S06	•	Outcomes from implementing Principle 10	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country
		Anti-competitive behavior	S07	•	No specific COP requirement	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes
	Compliance	S08	•	No specific COP requirement	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	
	<b>PRODUCT RESPONSIB- IILITY</b>	Customer health & safety	PR1	•	Actions taken and outcomes from implementing Principle 1	Lifecycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures
			PR3	•	Actions taken and outcomes from implementing Principle 8	Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements
		Product & service labeling	PR4	•	Outcomes from implementing Principle 8	HC of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes
PR5			•	No specific COP requirement	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	

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Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
Not reported	Not reported	Not reported	Not reported	Not reported
p. 77		p. 75, p. 83		
p. 29-44				
		p. 64		
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		p. 37, p. 38		
Not reported	Not reported	Not reported	Not reported	Not reported
		p. 64		
		p. 64 (*)		
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		p. 48-50		
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(\*) Examples or partial information relating to the GRI guidelines.



## Making the UN Global Compact - GRI connection

Information regarding the implementation by **Solvay Chemicals & Plastics** and **Solvay Rhodia** of the ten principles of the United Nations Global Compact can be found using this table of concordance.



In 2011, Solvay made its first annual Communication on Progress (COP), about implementation of the ten principles of the Global Compact Charter on supporting the broad UN development goal. 24 criteria of the advanced reporting level are already met. Solvay is consequently classified as a “Global Compliance Advanced” Company. Rhodia’s adherence to UN Global Compact goes back to 2003 and fully undertakes the 10 universal principles concerning human rights, working conditions, respect for the environment, and anti-corruption.

Issue Areas	GC Principles		Relevant GRI indicators
Human rights	Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights	EC5, LA4, LA6 - 9, LA13-14, HR1-9, S05, PR1-2, PR8
	Principle 2	Businesses should make sure that they are not complicit in human rights abuses	HR2-9, S05
Labor	Principle 3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining	LA4-5, HR1-3, HR5, S05
	Principle 4	Businesses should uphold the elimination of all forms of forced and compulsory labor	HR1-3, HR7, S05
	Principle 5	Businesses should uphold the effective abolition of child labor	HR1-3, HR6, S05
	Principle 6	Businesses should uphold the elimination of discrimination in respect of employment and occupation	EC7, LA2, LA13-14, HR1-4, S05
Environment	Principle 7	Businesses should support a precautionary approach to environmental challenges	EC2, EN18, EN26, EN30, S05
	Principle 8	Businesses should undertake initiatives to promote greater environmental responsibility	EN1-30, S05, PR3-4
	Principle 9	Businesses should encourage the development and diffusion of environmentally friendly technologies	EN2, EN5-7, EN10, EN18, EN26-27, EN30, S05
Anti-corruption	Principle 10	Businesses should work against corruption in all its forms, including extortion and bribery	S02-6



See:  
[www.solvay.com/EN/Sustainability/sustainabilityatsolvay/integratingsustainability/GlobalCompact.aspx](http://www.solvay.com/EN/Sustainability/sustainabilityatsolvay/integratingsustainability/GlobalCompact.aspx)

## Information on Solvay Chemicals & Plastics and Solvay Rhodia sustainability management



- **This yearly “complementary document”**, which complements the sustainability chapter of the Annual Report 2011 and presents 91 quantitative indicators for Solvay Chemicals & Plastics and 58 quantitative indicators for Solvay Rhodia  
[www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)



- **Solvay Annual Report** (for financial and governance data and a section on Risk management in particular)  
[www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx](http://www.solvay.com/EN/Investors/FinancialreportsFilings/AnnualReport.aspx)



- **“Towards Sustainable Development - Assessment and prospects 2008-2012”**, describing the Solvay policy, strategy, objectives and sustainability management, published every four years  
[www.solvay.com/EN/Lit/Literature.aspx#Sustainable Development](http://www.solvay.com/EN/Lit/Literature.aspx#Sustainable%20Development)

*Towards sustainable development 2008-2012  
– concise linguistic versions*



- **The websites on sustainability** for key recent achievements  
[www.solvay.com/en/sustainability/Sustainability.aspx](http://www.solvay.com/en/sustainability/Sustainability.aspx)  
[www.rhodia.com/en/sustainability/index.tcm](http://www.rhodia.com/en/sustainability/index.tcm)



- **The European Pollutant Emission Register (Europe)** <http://prtr.ec.europa.eu> and the Toxic Release Inventory (USA) [www.epa.gov/triexplorer/facility.htm](http://www.epa.gov/triexplorer/facility.htm) for environmental emissions





This assessment and review results from a continuous dialogue with our stakeholders. We invite you to contribute comments and share your ideas on how the Solvay group can make further improvements, by post or e-mail.

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