



SOLVAY

asking more from chemistry®

Building a new model of
sustainable chemistry

Sustainable
Development
Report
2013



Table of contents

1.

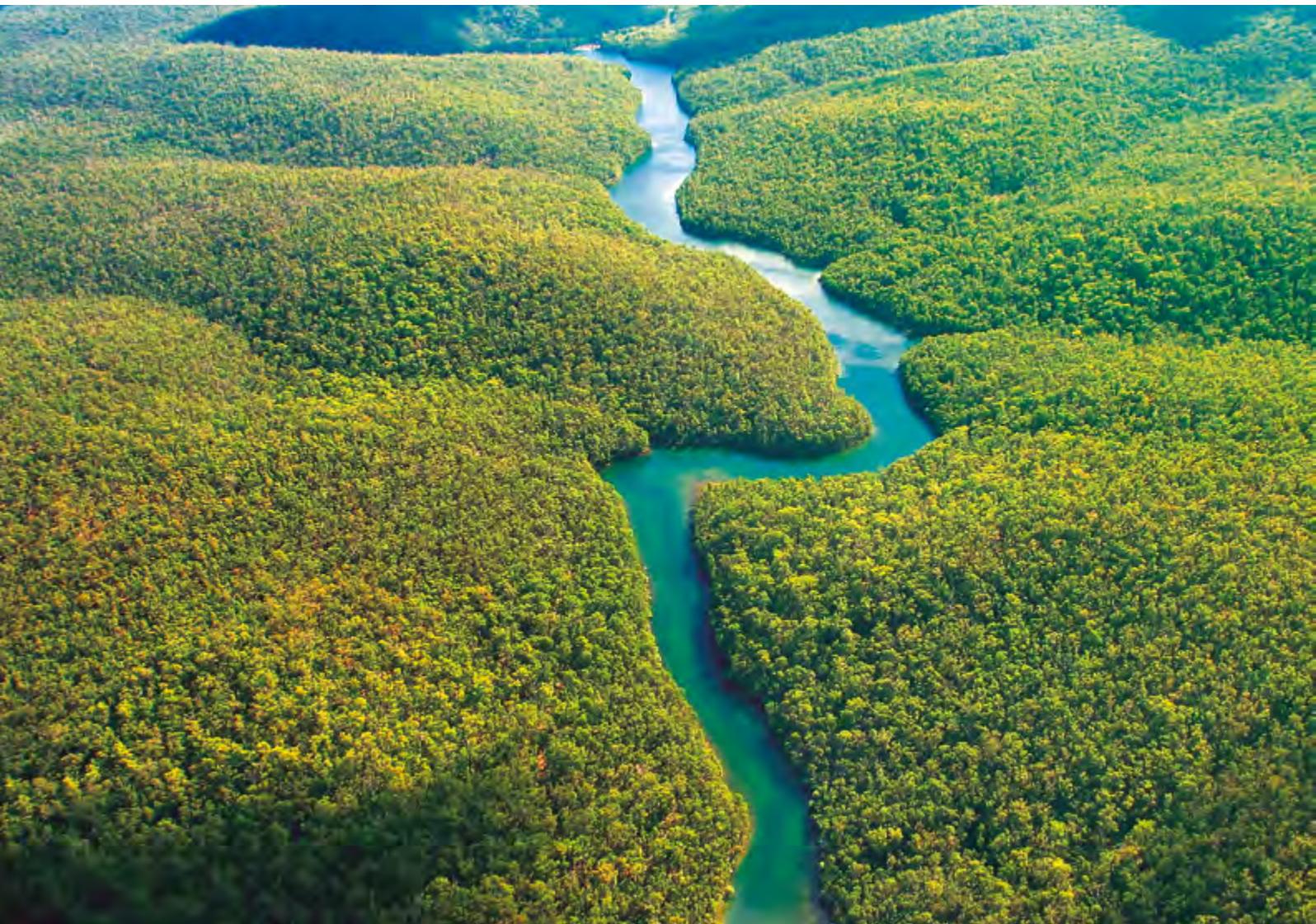
Sustainability management

1.1 Solvay's Vision	2
1.2 Sustainability targets for 2020	3
1.3 Global presence and markets	4
1.4 Interview with the Sustainable Development General Manager	6
1.5 Solvay Way	8
1.6 Committed to stakeholders	10
1.7 2013 Solvay Way results	12
1.8 Extra-financial ratings recognition	14

2.

Sustainable Development Indicators 2013

2.1 Scope and perimeter of reporting	18
2.2 Index GRI	20
2.3 Assurance report	32
2.4 Economic contents	34
2.5 Environmental contents	46
2.6 Social contents	72
2.7 Contacts	110



Solvay is part of a rapidly changing world that is facing major and urgent challenges of population growth, climate change and raw materials scarcity. The chemical industry, with its upstream position in the overall production chain, has an essential role to play in providing innovative and environmentally responsible solutions that downstream manufacturers can integrate into their own product offerings. In this way they fulfill the desire of large parts of the world's population for a better standard of living, without jeopardizing the physical and social environment for future generations.

Against this background, and with a sense of its corporate responsibility to society at large, Solvay has set out to **build a new model of sustainable chemistry**, in control of its impacts, creating value shared by its stakeholders, and contributing to the emergence of safer, healthier consumption and lifestyles.

The Solvay Sustainable Development Report for 2013 presents the Group's non-financial activities with a wide-ranging assessment, organized according to the reporting scheme given in the GRI (Global Reporting Initiative) version 4 guidelines.

In 2013 Solvay launched Solvay Way, its global sustainable development approach. This is expressed through a reference guide of 48 good practices, each associated with assessment criteria, aligned with ISO 26000.

These invite Group entities to assess their Corporate Social Responsibility (CSR) performance in the light of the expectations of their customers, employees, investors, communities and the planet. The results of the first assessment rounds are included in various parts of the present report.

The following report shares with you our assessment of our progress in this venture.

VISION

Building a strong leader,
a player in the reshaping
of the global chemical
industry.

Asserting ourselves as
a model of sustainable
chemistry, capable of
attracting and developing
talented people who
conceive, design and
produce solutions to meet
the major challenges facing
society today.

Responsibility: always a step ahead

Solvay's culture of responsibility is part of its historical identity base. A pioneer of social responsibility, the Group pioneered many innovations beneficial to workers: internal social security (1878), the 8-hour working day (1897), and paid holidays (1913). For the past 150 years Solvay has also been developing a culture of safety and social dialogue, including being one of the first groups to engage in a dialogue in a European structure, and then at global level. Today, its social practices are one of its strengths, positioning it as a leading player in Corporate Social Responsibility (CSR).

Sustainability targets for 2020



Energy and climate*

10%

reduction in greenhouse gas emissions and primary energy consumption



Water*

10%

reduction in the withdrawal of groundwater and drinking water

Implementing Sustainable Water Management at

100%

of our sites under water stress



Emissions and effluents*

25%

reduction in air emissions of substances with acidification potential

10%

reduction in air emissions of substances with a photochemical oxidant formation

20%

reduction in water emissions with eutrophication potential



People safety

Reaching a number of a work accident with medical treatment per million hours lower than

1.0



Process safety

Having

100%

of our production sites with risk analysis updated in the last five years



Learning & development

Ensuring

1

week of training per employee and per year

Training

100%

of our employees to the Solvay Way reference framework



Sustainable Portfolio Management (SPM)

20%

of our turnover in the "Star" category according to the SPM assessment

100%

of our R&I projects in the "Star" or "Aligned" category according to the SPM assessment

* Base 2012, at constant activity perimeter.

At constant activity perimeter means that the absolute performance is corrected for changes in production volumes and for sites entering or leaving the Group perimeter.

A global player able to produce solutions responding to planetary challenges

Solvay produces a wide range of sustainable, high added value solutions for diversified markets, in particular in growth areas, where it is often a reference player.

A diversified offering



CONSUMER GOODS & HEALTHCARE

Through its diverse offering, Solvay seeks to improve the performance and ease of use of products employed every day. Its solutions based on specialty surfactants, its polymers and its fluorinated fluids contribute to the effectiveness of detergents and hygiene products. Its polymers, polyamide and intelligent fibers are used by the textile industry to create high-performance clothing. The range of cellulose acetates serves the cigarette filters market. For health professionals, the Group develops a wide range of products including specialty polymers for biocompatible medical implants, synthesis intermediates and sodium bicarbonate for effervescent tablets.



AUTOMOTIVE & AERONAUTICS

Solvay offers the automotive market polyamides, specialty polymers and composites that improve performance and contribute significantly to lighter vehicles. Fluorinated electrolytes and lithium salts improve the efficiency of batteries. Solvay's solutions enable automakers to meet constantly rising global standards such as rare earth oxides for catalysis and silicas for the tire labeling. On the aeronautics market, the chemical, mechanical and thermal resistance properties of Solvay advanced solutions contribute to the performance and safety of airplanes.



AGRO, FEED & FOOD

Solvay products and solutions respond to the needs of players right along the food chain. Upstream, its guar derivatives, its fluorinated compounds and its solvents protect crops and improve their productivity, while respecting the environment. Downstream, its range of vanillins contributes to healthier diets, for example by contributing to reducing fats and sugars in processed foods. Sodium bicarbonate promotes a balanced diet and preserves animal health. Finally, cellulose acetate is used to produce environmentally responsible food packaging.

€9 940

million
net sales

29 400

employees

117

sites and presence
in 56 countries



EUROPE



**ASIA PACIFIC
AND THE REST OF THE WORLD**



NORTH AMERICA



LATIN AMERICA

33%
of net sales

15 800
employees

49
industrial sites

8
R&I centers

31%
of net sales

6 000
employees

28
industrial sites

4
R&I centers

25%
of net sales

3 700
employees

33
industrial sites

2
R&I centers

11%
of net sales

3 900
employees

7
industrial sites

1
R&I center



**BUILDING
& CONSTRUCTION**

Solvay products make it possible to design buildings that are at once more sustainable, healthier to live in and consume less energy. Its solutions are used in the production of flat glass and double or triple glazing window structures to stringent environmental requirements. Fluorinated products permit the production of high quality insulating foams. Biodegradable solvents are used in paints and “green” coatings. Finally, fluoropolymers and engineering plastics increase the fire resistance of electrical components and cabling.



**ELECTRICAL
& ELECTRONICS**

Solvay specialty polymers opens new horizons in terms of design, safety and performance to its industrial customers, who take part in the forward march of tablets and smartphones, of OLED technology, of rigid and flexible displays, computer processors and memories and of semi-conductors based on rare earths. For the electrical connectors industry, Solvay develops specific products and fluorinated polyamides with circuit breaker and flame-retardant properties. It also offers eco-responsible solutions including the recycling of rare earths and bio-based polyamides.



**ENERGY
& ENVIRONMENT**

Solvay supports energy markets in their quest for improved performance and lower costs. Guar or surfactants provide solutions for oil and gas extraction. PVDF films improve the performance and durability of solar panels, while lithium salts increase battery performance. Solvay processes and solutions are used to produce energy from biomass. Solvay offers its industrial customers its expertise in energy optimization. Elsewhere, Solvay proposes solutions for reducing air, water and soil pollution.



**INDUSTRIAL
APPLICATIONS**

Solvay provides industries with agents and intermediaries to meet their challenges of competitiveness and environmental performance.

INTERVIEW WITH
JACQUES KHELIFF,
GROUP GENERAL MANAGER SUSTAINABLE DEVELOPMENT



“CSR* performance is now a pre-condition of a long term economic performance.”

What role does sustainable development play in Solvay’s accelerated growth strategy?

Jacques Kheliff: Sustainable development is a driving force of the Group’s strategy, a part of our vision and integrated into our processes: it is a way of practicing our professions, of looking ahead, and of guiding our investments to ensure that we respond with our solutions to global challenges. Sustainable development is also a lever for growth: a portion of our business is already oriented towards markets driven by the demands and opportunities associated with these developments. In 2013, we took a further step towards achieving our vision by launching Solvay Way. This defines Solvay’s commitment to Corporate Social Responsibility, implemented through a reference framework of best practices. It expresses our desire to operate responsibly across the world, and to accelerate the Group’s

* Corporate Social Responsibility

“The critical and committed inspection of our practices by a global union contributes to our thrust for progress.”

progress towards sustainable chemistry. Solvay Way is an ambitious and pragmatic approach, backed by concrete commitments and continuous improvement. It seeks to build a wide-based culture of responsibility, with every employee at every site adopting the associated practices and behaviors.

What conclusions do you draw from this implementation year?

J.K.: 2013 saw the deployment of the reference framework to all Group entities, through a network of about 200 champions and correspondents. All entities have assessed their practices and identified their areas of improvement for 2014. The results are very satisfactory, telling us that not only all sites have been informed and got the message, but that they have moved into action. Employee involvement was in many cases substantial; and this is another success. This rapid taking of ownership makes us confident of deploying a wide culture of responsibility.

Solvay has signed a global agreement on social and environmental responsibility with the IndustriALL Global Union. What do you expect from this agreement?

J.K.: Let us remember that quality social dialogue is a key factor in the Group's effectiveness. Solvay is a pioneer in social responsibility: the safety and welfare of its employees has been a major concern since its inception 150 years ago. In 2008, we were among the first to sign a responsibility charter at European level. Since then we have changed dimension, requiring us to extend the scope of our commitments to cover all sites across the world. We have therefore signed a responsibility agreement with IndustriALL Global Union. This agreement reflects our desire to respect the same high social standards all over the world. Each year, two assessment missions are conducted on-site: one focused on safety, the other on the implementation of the Agreement in all its aspects - respect for the fundamental rights defined by the ILO (International Labour Organization) and the UN Global Compact, labor law, trade union rights, and supplier relations. This agreement is important by the fact of its existence and the guarantees it provides, but also by the quality of its implementation. The critical and committed eye of a global Union

on our practices contributes to the thrust for progress that will help us perfect the model of sustainable chemistry we wish to promote.

What are your major projects in the coming years?

J.K.: We will continue to work to achieve the level of excellence set by the reference framework by further increasing management involvement and the commitment of everyone.

Another important focus is to deploy our SPM (Sustainable Portfolio Management) methodology to integrate as far upstream as possible our goal of more sustainable development right from the creation of our products, responding to a growing customers demand.

We are also involved in energy transition. At group level, we have set ambitious targets to reduce our energy consumption and greenhouse gas emissions, and have introduced an energy efficiency control program. We support the development of renewable energies and are seeking to ensure that fossil fuels are used with a reduced impact on the environment and water. Moving forward in this direction by contributing to the gradual emergence of an alternative energy mix is the reason for the acquisition of Chemlogics.

All these projects align with Solvay's ambition of profitable growth: Corporate Social Responsibility performance is one of the preconditions for economic performance, a trend that we are convinced will continue in the coming years.

Solvay Way, an approach embedded in our processes

The Corporate Social Responsibility approach launched in 2013, aims to accelerate Solvay's progress towards sustainable chemistry. Its lofty goals determine the direction and operation of the Group and are embedded into all processes. Across the world, the tools and principles applied in order to achieve the objectives are driven and directed in a homogeneous fashion, with the same high standards.

At the heart of the management processes

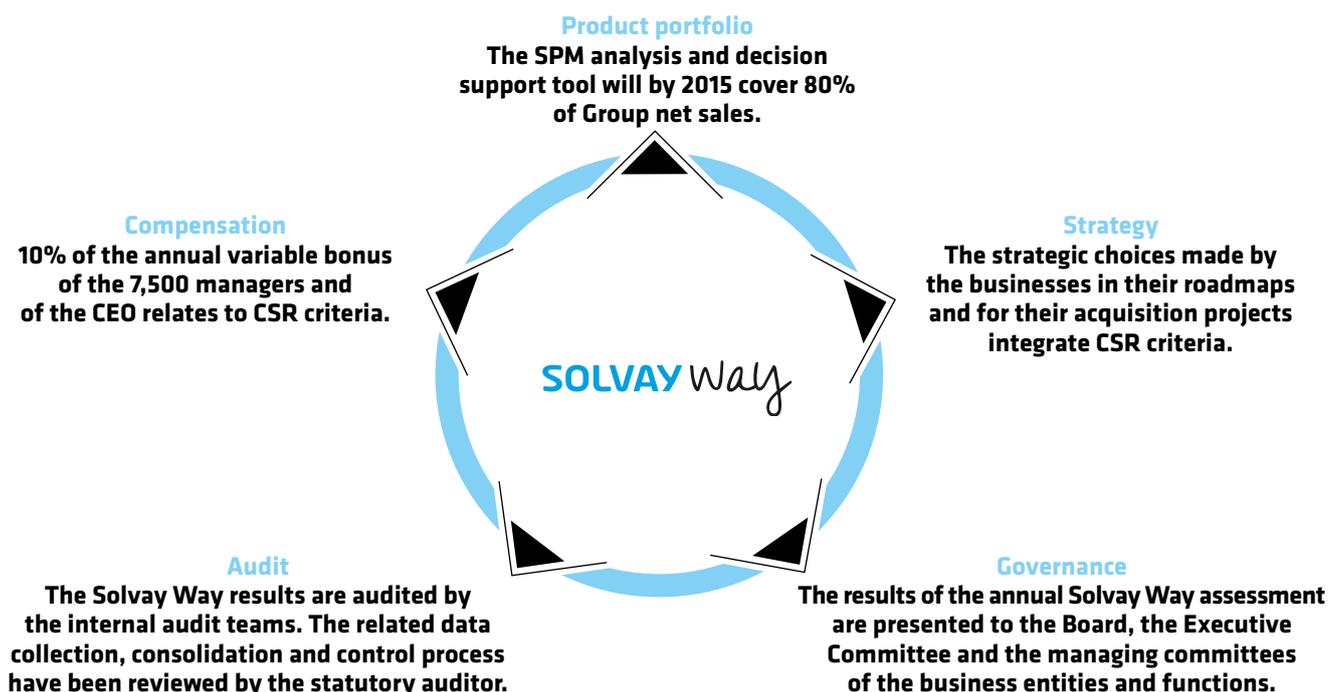
To ensure rapid progress along the Solvay Way, the Group has integrated the goals of a more sustainable development into all its managerial processes. In this way it can be sure that every player is vigilant in meeting their commitments at every stage of the business cycle and in all stakeholder relationships:

Ethics: the Solvay Code of Conduct, that sets an ethical framework for employee behavior, includes a section dedicated to respect for responsible practices vis-à-vis the Group's stakeholders and the environment (details on page 91).

Human Resources: The Solvay Way commitments reflect the global structures and processes introduced by Human Resources for the successful transformation of the Group. The emphasis on the development of people and their employability through mobility and dialogue plays an important role in gaining employee commitment to the

new culture of the Group and strengthening their pride in belonging. In 2013, Solvay's 600 human resources specialists mobilized to generalize these tools and methods across the new Group (details on page 73).

Purchasing: in accordance with the principles of Corporate Social Responsibility (CSR) established by Solvay Way, the Group is developing lasting relationships with its suppliers through information, exchanges, training, assessment and innovation. Potential suppliers are evaluated and selected using identical methodology in all geographic areas. Solvay is also involved in the creation and implementation of the "Together for





Sustainability” (TFS) initiative in conjunction with several industrial companies, with shared audits and assessments of suppliers’ responsible practices. In 2013, 2 000 assessments and audits were undertaken in this framework (details on page 93).

_Innovation: the SPM (Sustainable Portfolio Management) methodology is applied to the entire project portfolio. In this way each new project is evaluated to measure its environmental footprint and its societal acceptance throughout the development process, from drawing board to implementation.

_Production: All sites are required to apply the (HSE) Health Safety Environment management system aligned with ISO 14001 and OHSAS 18001 standards (details on page 48). Based on these requirements Solvay Way helps industrial units to measure annually their maturity in managing operator safety and health, product safety and controlling their environmental footprints.

Strictly controlled application

_Annual progress reporting: In accordance with its commitment to transparency, Solvay publishes every year its CSR performance, enabling all stakeholders to evaluate its progress. Submitted to the Executive Committee, this report is, along with the Group’s economic performance, one of the diagnostic and decision support tools used by the Board of Directors.

_Readiness to give account: In line with its ambition to be recognized as a model of responsible chemistry, the Group has opted to submit the Solvay Way self-evaluations and performance indicators to control by internal audits and external agencies. The consolidated annual report on the reference framework is presented to the employee representative bodies, under the global agreement signed in December 2013, to the leaders of the IndustriALL Global Union.



For the respect of Human Rights

Solvay is a participant in the UN Global Compact, aligned with the OECD Guidelines for Multinational Enterprises. The Global Compact was first launched in 1999 by Kofi Annan, the then General Secretary of the United Nations Organization. By signing up to the Global Compact, companies confirm their conviction that commercial practices founded on a certain number of universally recognized principles will help lead to the emergence of a more stable, equitable and open world market and the development of prosperous and dynamic societies.

www.unglobalcompact.org



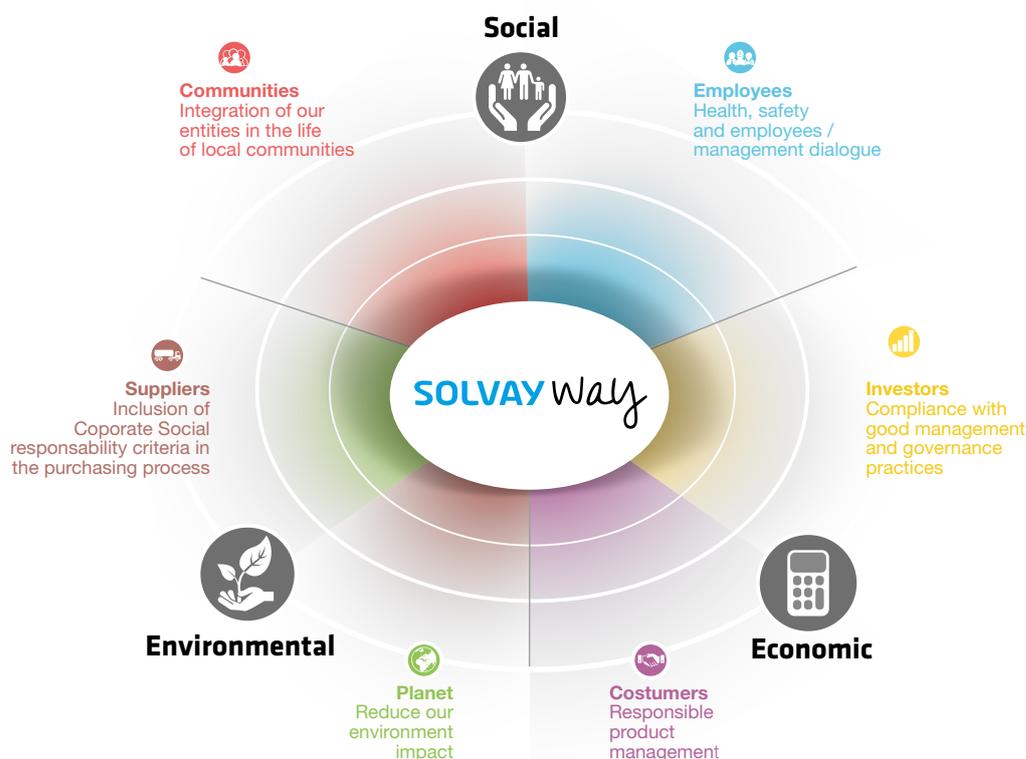
For a Responsible Chemical Industry

Solvay commits to the “Responsible Care®” World Charter. Responsible Care® is an initiative taken by the worldwide chemical industry aimed at achieving continuous improvement in the safe handling of chemical substances from their initial development to their final use. First launched in 1987, Responsible Care® is now implemented in 53 different countries and goes far beyond the bare legal requirements in the majority of these countries. In 2006, a Responsible Care® Global Charter was adopted to reinforce this program with more stringent requirements in terms of product life-cycle management and information provided to stakeholders.

www.icca-chem.org

Committed to stakeholders

A specific feature of Solvay Way is the way its commitments are directed towards the expectations of stakeholders. The Group is committed to developing, through its practices and behaviors, a chemistry that is ever more responsible and respectful of social, societal and environmental issues.



MANAGE HEALTH AND PHYSICAL WELL-BEING OF WORKERS

Medexis tool is aimed at managing all occupational exposure data of each worker at Group level together with the medical data. The main objective is to support a uniform and high level of prevention of health risks throughout the Group, through reliable information and a better evaluation of occupational hazards and risks of each individual person. For more details on Medexis, the reader is referred to page 79.



HIGH ETHICAL STANDARDS IN CONDUCTING BUSINESS

In cases of serious breach, employees may speak directly with the Head of Ethics and Compliance or the Group General Counsel. As an alternative, employees may wish to use the Ethics Helpline, Speak up, maintained by a private third party and operated in accordance with local law.



BIODIVERSITY

In order to check the absence of impact on aquatic biodiversity, Solvay has developed impact assessment methodologies based on biotic index and an overall effluent toxicity approach. The biotic index already used for several years in many plants will be extended to more sites. This will contribute to a better assessment of Solvay water effluents by checking the absence of effect of its activities on the local water biological life.



TRANSPORT RISK MANAGEMENT

Solvay has developed several preventive actions to avoid accidents and mitigate consequences. Carechem24 (and Chemtrec in the US) worldwide service allows any caller anywhere in the world to get a telephone response and technical advice in his/her language in case of an emergency, 24 hours a day, 7 days a week. Phone numbers to be used are displayed in the Safety Data Sheets and on the transport documents and labelling.



Bound to employees by a global agreement

On December 17, 2013, Solvay signed with the IndustriALL Global Union a global agreement on social and environmental responsibility. The specificity of this agreement, that extends and strengthens the Group's earlier commitments, lies in the desire of both partners to make it operative in a concrete and dynamic way. Every year, IndustriALL representatives will meet Solvay employees to check on compliance in the field, with two assessment missions at two different sites. The first mission will measure the results of the Group's safety policy. The second will examine the application of the agreement in all its dimensions: respect for international social standards, risk management, compensation, outsourcing, respect for the environment, implementation of Solvay Way (details on www.solvay.com/en/sustainability).

A product range with a sustainable development dimension

The "Sustainable Portfolio Management" (SPM) methodology, right now in the course of global deployment Group-wide, is one of the key tools used by Solvay to meet the growing needs of chemical solutions integrating Corporate Social Responsibility. As a diagnostic tool, SPM makes it possible to define the practical risks and opportunities of the "sustainable development" dimension of product and innovation portfolios, with an accurate profile of the portfolio at a particular point in time. Products and their applications are assessed along two axes:

- the environmental impact of the production processes, including the raw materials,
- how far each product, in each end market, meets the requirements of sustainable development.

In this way the different activities start from a solid base of consolidated information with which to align their strategic choices on the challenges of sustainable development (details on page 35).

2013: successful deployment of Solvay Way

Deployed in 2013 across all Group entities, Solvay Way has been a rapidly appropriated, with all sites undertaking an initial self-assessment of their practices as the first step in the implementation of improvement plans.

Close to the ground



The deployment of Solvay Way on the ground and its day-by-day implementation are provided by a network of more than 200 “champions” and “correspondents”, tasked with making Solvay Way work in their organizations. The network of “champions”, operating at Businesses and Functions level, is relayed locally – at industrial sites, R&I laboratories and business units – by a team of “correspondents”. Theirs is the job of involving their colleagues in the process and mobilizing them to set goals and develop action plans.

Champions’ and correspondents’ activities are coordinated and supervised by sustainable development management, which passes on to them the needs expressed by the various stakeholders and reports directly to the CEO.

The success of Solvay Way is the responsibility of all employees, each being invited, through his or her attitude and personal involvement, to take on board the Group’s sustainable development objectives.

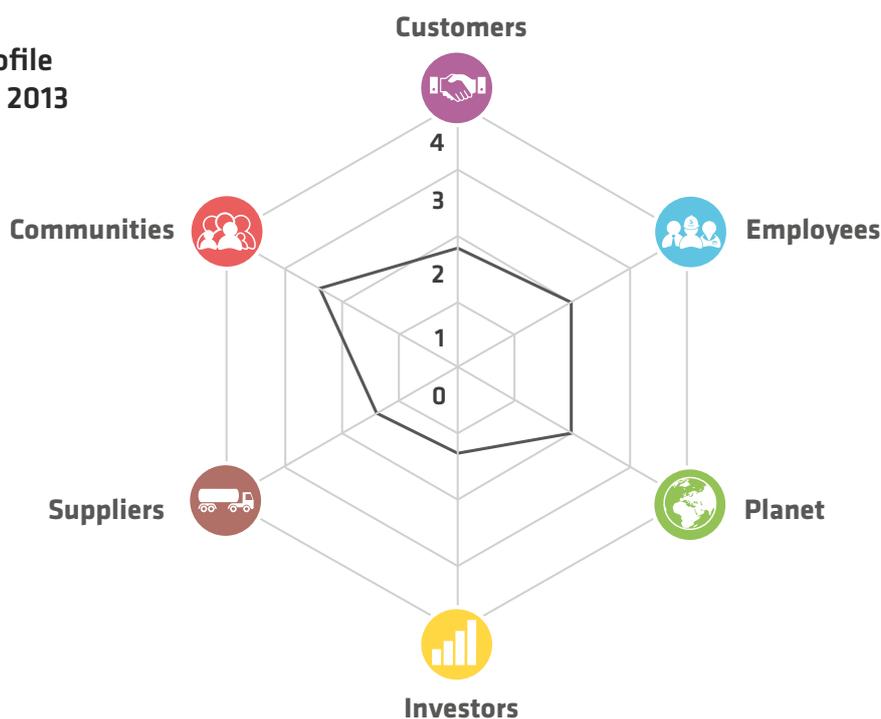
and progress. Solvay Way lists 48 practices, taking into account the best practices of Solvay and Rhodia, and which are considered as priority. They reflect the Solvay Way’s 23 commitments and are structured on a four-level scale (launch, deployment, maturity, performance). This framework provides the self-assessment grid that enables managers of the different sites to assess every year how much progress they have made in sustainable development.

The aim of this approach is to have each entity measure itself against the Solvay Way objectives, identify areas for improvement by stakeholder group, and develop an improvement plan.

A demanding and structure-giving reference framework

Rigorous in approach and incorporating ISO 26000 key guidances, Solvay Way is based on a challenging reference system, serving as a tool of both measurement

Solvay Way Profile
of the Group in 2013



Results of the first self-assessment



In 2013, for the first time, all Solvay entities assessed their social and environmental responsibility practices: operating divisions, all production sites and research centers, all Solvay's purchasing, finance, legal, public affairs, strategy, marketing and human resources departments, industrial function, and the Group headquarters in Brussels (as a pilot entity).

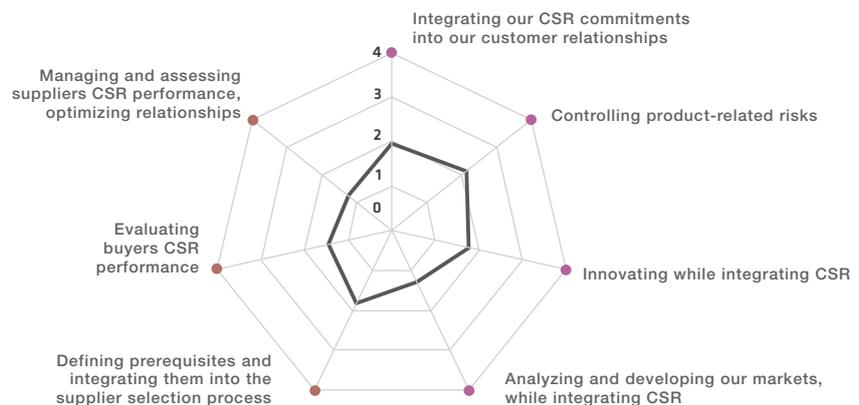
More than 10% of the personnel at each site were involved in the self-assessment process. This first assessment is a good picture that shows strengths & weaknesses, enabling business and corporate functions to implement progress actions plans for 2014.



Customers/Suppliers

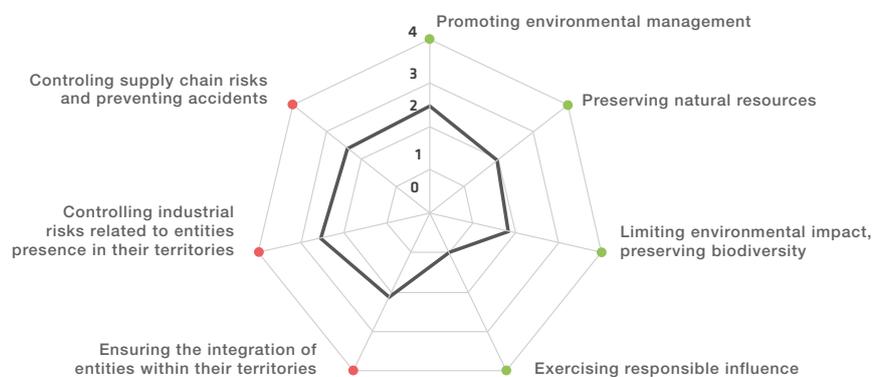
While the best performances concern product safety, Solvay's GBU have now to progress to better integrate CSR into their roadmap based on SPM analysis of their portfolio.

Procurement processes are taking place in the new Solvay, and in this context a special effort will be made to open new area of partnerships with our suppliers.



Planet/Communities

Best performances concern environmental and industrial risk management which are major stakes for the industrial sites. Entities need to continue their effort to reduce energy consumption and greenhouse gas emissions.



Employees/Investors

The best performances are related to health and safety at work.

Processes of the new Solvay (Code of Conduct, risk management...) were defined late in 2013 and will be fully deployed in 2014.



Performance recognized in extra-financial ratings

For 2013, the recognition of Solvay's performance is illustrated by its integration into the DJSI (Dow Jones Sustainability Index). The Group has also received positive ratings from other major extra-financial rating agencies (Eiris, Carbon Disclosure Project, Vigeo).

Solvay, as a quoted company, answers each year questionnaires from global or European extra-financial rating agencies. These analyze and classify companies for their results on Corporate Social Responsibility (CSR), after which the best-performing companies are referenced in the different non-financial stock market indices. Inclusion in these gives Solvay's investors and others external

stakeholders a broader base for assessing the Group's global performance and a good opportunity to challenge its policies, processes and practices in terms of its ability to integrate the sustainability dimension.

The main 2013 results and comments described are below.

Rating agency	Global result	Positioning	Best scores	Weakest scores
RobecoSAM (reference for Dow Jones Sustainability Index) 	Score of 78/100*	Better than 88% of the companies of the sector	→ Product Stewardship → Environmental policy/management system → Innovation management	→ Customer relationship management → Operational eco-efficiency → Human capital development
Carbon Disclosure Project (reference for Carbon Disclosure Leader Index and Carbon Performance Leader Index) 	Category B with a score of 89/100**	Within the top 10 in the Benelux Carbon Disclosure Leadership Index	→ Governance & strategy → Reporting of emissions → Management	→ Risk management and opportunities related to climate → Risk and opportunities related to supply chain with respect to climate challenges management → Commitment and performance verification
EIRIS (reference for FSTE4Good) 	Absolute score: 3.6/5 Solvay included in FTSE4Good Index	Score relative to peers: 85%	Within the 1 st quartile of the "assessed universe" and "supersector" companies	→ Climate change → Human and labor rights → Governance
Vigeo (reference for NYSE Euronext Vigeo 120 world) 	Overall score of 58/100***	Solvay's performance is considered to be robust and stable	→ Environmental strategy → Health and safety → Energy → Product safety → Water → Accidental pollution → Atmospheric emissions	→ Governance → Transportation → Green products → Community involvement → Responsible lobbying

* The score are 78/100 for the economic, 72/100 for social and 85/100 for the environmental dimensions.

** One point below requirements for referencing in the Carbon Disclosure Leadership Index.

*** Environment: 60/100; Human Resources: 72/100; Human Rights 67/100; Community Involvement: 37/100; Business Behavior 53/100; Corporate Governance 50/100.



Towards an integrated reporting of financial and extra-financial performance

Solvay is convinced of the need to progress towards a more integrated reporting of its CSR performance through financial metrics. This would allow an easiest evaluation by its various stakeholders in a clear, concise, connected and comparable format. Such an integrated report should be an organization's primary reporting vehicle. Solvay is a member of the International Integrated Reporting Council (IIRC). This organization aims to facilitate the development of such integrated reporting over the coming decade and enable stakeholders – investors, regulatory bodies and others – to make better short and long-term decisions.



Act now for the future

As member of the World Business Council for Sustainable Development (WBCSD) since 2009, Solvay has collaborated with chemical sector companies on a project through 2011-2012 to agree on a harmonized and coordinated approach to corporate greenhouse gas accounting and reporting. Building on this successful approach, WBCSD has launched a new project entitled **"Reaching Full Potential"** to improve definition of metrics and analysis of the value chain and contribute to the move to a more sustainable world. Solvay co-chaired this project with AkzoNobel, DSM and Evonik, and relies on ten other chemical companies.

Another project, **"Action2020"**, emerged from the WBCSD's Vision 2050 report. This is a platform for examining how business can positively influence environmental and social trends while strengthening its own resilience to issues like climate change, demographic dynamics and skills shortages. Fully committed to this project Jean Pierre Clamadiou, CEO of Solvay, co-chaired Action 2020 and the Group is already collaborating on Business Solutions along with 40 other WBCSD members.

Dialogue with investors on sustainability

The sustainability dimension is increasingly important to institutional investors. Ratings by financial agencies now progressively encompass sustainability indicators. Solvay is developing an active dialogue on its sustainability policy and parameters and multiplies the opportunities of interaction with investors involved in Corporate Social Responsibility (CSR) values. Solvay is further developing active, targeted communication.

Solvay's disclosure in these matters is more and more appreciated and assessed as "best in class" by many. Sustainability matters are regularly reviewed at the Executive Committee level, and are discussed on an annual basis at Board of Directors level.

	2011	2012	2013
Meetings with investors focussed on sustainability	12	10	26

Solvay took part to 3 SRI Roadshows in 2013.



2

Sustainable Development Indicators 2013

2.1 Scope and perimeter of reporting	18
2.2 Index GRI	20
2.3 Assurance report	32
2.4 Economic contents	34
2.5 Environmental contents	46
2.6 Social contents	72
2.7 Contacts	110

Scope and perimeter of reporting

The Sustainable Development Report presents a comprehensive series of indicators which, all together, reflect the deployment of the overall sustainability management so far, the sustainability objectives pursued in the past years, and key recent achievements.

The extra-financial parameters and indicators reported in this document are organized according to the reporting scheme given in the Global Reporting Initiative (GRI) guidelines. The indicators are those that best reflect the Group's performance recognized good practices and the objectives set in the governance, social, environmental or health & safety fields.

For 2013, 80 extra-financial parameters relating to sustainability performance are reported. These cover the strategy objectives set in the light of stakeholders' expectations.



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

- Solvay Annual Report (including the risk management chapter)
- Solvay Sustainable Development Report

 In order to ensure the reliability and credibility of its extra-financial reporting, Solvay commissioned one of its statutory auditors, Deloitte, to verify a selection of sustainability information. This verification process aims at providing a limited assurance report on the targeted sustainable development indicators and assertions. On top of the energy and environmental information already verified in previous years, Human Resources and safety indicators have been included in the audit scope.

This verification process implies the following steps: review of the reporting scope and analysis of the organization, protocols and reporting tools, test of the reliability of the information at site level (audit sample), review of the implementation of controls during consolidation steps, verification of the published information.

For more details on the Assurance report, the reader is referred to the page 32-33.

2013 consolidation scope

Unless stated otherwise the consolidation scope of this report is the same as for the financial report. For more information on the 2013 consolidation scope, the reader is referred to the page 133 in the financial section of the Annual Report.

In the frame of convergence toward Integrated Reporting, previous years' data reflect the historical performance of the Solvay Group, compatible with the financial statements of those years, and are not

recalculated at constant perimeter. This is a fundamental change compared to the previously published Sustainable Development Reports.

Definition of indicators for energy

Energy consumption has three components:

- Primary fuels (coal, gas, fuel oil etc.). The primary fuels are used:
 - to produce internally steam, electricity and mechanical energy,
 - in manufacturing processes (coke in lime kiln / gas in pyrolysis furnaces etc.).
- Purchased steam,
- Purchased electricity.

These three components are converted into primary energy, in order to get the total energy consumption in Petajoules (PJ) low calorific value, with the following conventions:

- Fuels using the net calorific values;
- Steam purchased assuming an efficiency of 90% based on the net calorific value of the fuels used for its generation;
- Electricity purchased assuming an average efficiency of 39.5% for all types of power production except for nuclear power (33%, based on net calorific value (source IEA).

Definition of indicators for greenhouse gases (GHG) (scope 1 + 2)

The GHG emissions reported by Solvay correspond to the scope of the Kyoto Protocol and comprise the following compounds/compound families: CO₂ / N₂O / CH₄ / SF₆ / HFCs and PFCs. The impact on climate change (expressed as teq CO₂) is calculated using their respective Global Warming Potential (GWP) potentials (as defined by the IPCC) and taking further into account:

- The direct emissions for each GHG released from Solvay's industrial activities (Scope 1 of Kyoto Protocol).
 - For CO₂, the reporting of direct emissions includes emissions from the combustion of all fossil fuels as well as process emissions (e.g. thermal decomposition of carbonated products, chemical reduction of metal ores);
- The indirect emissions of CO₂ linked with the steam and electricity purchased externally (Scope 2 of Kyoto Protocol);
 - Convention adopted for CO₂ emissions related to acquired electricity: the emission factor specified in the supply contract or, if not defined there, that of the power supplier. In case of no publication by the power supplier, the national CO₂ emission factors for electricity generation published by IEA in the "CO₂ emissions from fuel combustion" statistics.

Definition of indicators used to monitor environmental performance related to emissions of pollutants to air/water

The main indicators used to assess the environmental impact of Solvay's manufacturing activities are: climate change (Kyoto and non-Kyoto GHG, teq CO₂), (stratospheric) ozone depletion (teq CFC11), (tropospheric) photochemical ozone creation (teq NMVOC), eutrophication (teq PO₄), and acidification (teq SO₂). These main impact categories are internationally recognized and calculated using the characterization factors published by ReCiPe, which is a compendium of legally recognized databases from the IPCC (International Panel on Climate Change), WMO (World Meteorological Organization), SETAC-UNEP, and elsewhere.

Besides those 5 main impact indicators, Solvay publishes emission data related to specific pollutants and pollutant families.

Additional indicators (compartment "air"):

- Dust (amount of solid particles emitted to air), tons;
- Sulfur oxides (sum of sulfur oxides, conventionally expressed as SO₂), tons;
- Nitrogen oxides (sum of nitrogen oxides excluding N₂O, conventionally expressed as NO₂), tons;
- NMVOC (Non Methanic Volatile Organic Compounds), tons.

Additional indicators (compartment "water"):

- COD (Chemical Oxygen Demand, amount of oxygen required to chemically oxidise organic matter into CO₂), tons O₂;
- TN (Total Nitrogen, i.e. sum of inorganic nitrogen species such as nitrites, nitrates and ammonia and organic nitrogen species such as amines, tons;
- AOX (Organic Halogens Adsorbable onto active carbon), tons;
- TP (Total Phosphorous, i.e. sum of inorganic phosphorous species such as phosphates and organic phosphorous species such as phosphate esters, tons;
- Heavy metals (sum of the metals As, Cd, Cr, Cu, Hg, Ni, Pb and Zn recorded in the E-PRTR pollutant list).

Definition of indicators used to monitor water intake

- Hazardous industrial waste, tons;
- Non-hazardous industrial waste, tons;
- Landfilled hazardous industrial waste, tons;

Solvay's internal waste reporting counts four waste categories: industrial waste, construction and demolition waste, mining waste, and domestic waste. Industrial waste, on which we report, is the waste

generated by the industrial activity on a production site, including normal maintenance and packaging waste. To distinguish between hazardous and non-hazardous waste, Solvay uses the classification criteria mentioned in Appendix III of Directive 2008/98/EC. Landfilling is the disposal of waste materials by burial at dedicated sites.

□ Absolute environmental indicators

For any year within the period 2009-2013, the environmental indicators correspond to the financial perimeter of the Group and reflect the reality of the Group during that year. Due to a new waste reporting structure, the waste related indicators are only displayed as from 2011.

□ Relative environmental indicators

Solvay's relative environmental indicators are performance indicators at constant perimeter; their values are expressed as a percentage of their efficiency in the reference year 2012. As such they can be compared directly with the reduction targets the Group has set in its new Environmental Plan. For more details on the Sustainability targets for 2020, the reader is referred to the page 3.

To obtain the relative environmental indicators, the absolute environmental indicators are corrected for changes in the Group's perimeter (incoming and outgoing sites) and normalized by the production volumes in order to correct for changes in economic activity.

Solvay is a GRI Organisational Stakeholder. We elaborated our Sustainable Development Report as close as possible to the GRI G4 guidelines. We are in process of analyzing the materiality and of aligning indicators' definitions according to G4. The table below describes the coherence between our Solvay's Annual Report, Sustainable Development report, United Nations Global Compact Principles and GRI G4.



GRI N°	Standard Disclosure	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
1. Strategy and Analysis						
G4-1	Statement from the most senior decision-maker of the organisation about relevance of sustainability to the organisation and its strategy	■	F	Ongoing commitment to the GC, pp. 3, 9-14	pp. 13-17	pp. 6-7
G4-2	Key impacts, risks and opportunities	▣	F	Ongoing commitment to the GC, pp. 3, 9-14	pp. 147-161	
2. Organizational profile						
G4-3	Company name	■	F	Cover and back cover		
G4-4	Principal brands, products, and services	■	F		pp. 8-9	pp. 4-5
G4-5	Location of headquarter	■	F		p. 164	
G4-6	Countries where the company is established	■	F		pp. 8-11, 133-140	p. 5
G4-7	Nature of ownership and legal form	■	F		p. 164	
G4-8	Markets served with geographic breakdown	■	F		pp. 4-5, 8-11	
G4-9	Scale of the organization	■	F			p. 5
G4-10	Employment	▣	F	Principle 6, pp. 5, 20-25		pp. 74-76
G4-11	Percentage of employees covered by collective bargaining agreements	■	F	Principle 3, pp. 5, 16-25	p. 36	pp. 11, 92
G4-12	Organization's supply chain	–	–			
G4-13	Significant changes in the reporting period	■	F		pp. 12, 46, 133	pp. 18-19
G4-14	Position regarding the precautionary principle and its application	■	F	pp. 9-14, 26-30	pp. 33-36	pp. 6-13, 48-49
G4-15	Adherence to charters, principles and other external initiatives	■	F		pp. 34-36	pp. 9-11
G4-16	Membership of associations, including trade bodies	▣	F		pp. 34-36	

GRI N°	Standard Disclosure	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
3. Identified material aspects and boundaries						
G4-17	All entities included in the organization's consolidated statements	■	F		pp. 133-140	pp. 18-19
G4-18	Process for defining report content, aspect boundaries and GRI principles	▣	-			pp. 6-13, 18-19
G4-19	Material Aspects identified in the process for defining report content	▣	-			pp. 18-19
G4-20	Boundaries of material aspect within the organization	▣	O			pp. 18-19
G4-21	Boundaries of material aspect outside the organization	▣	O			pp. 56, 78-86
G4-22	Explanation of the consequences of any changes in the boundaries of the report	■	-			pp. 18-19
G4-23	Consequences of the changes in the scope and aspect in boundaries	▣	-			pp. 18-19
4. Stakeholder engagement						
G4-24	Stakeholders group considered	■	O	Sharing the COP with the Company's Stakeholders, p. 12	pp. 34-36	pp. 10- 15
G4-25	Basis for identification of stakeholders	▣	O	Sharing the COP with the Company's Stakeholders, p. 12	pp. 34-36	pp. 10- 15
G4-26	Approaches to dialogue with the stakeholders	▣	O	Sharing the COP with the Company's Stakeholders, p. 12	pp. 34-36	pp. 14-15, 94-99
G4-27	Stakeholders' concerns	▣	O	Sharing the COP with the Company's Stakeholders, p. 12	pp. 34-36	pp. 8-15, 94-99
5. Report profile						
G4-28	Reporting period for the information provided	■	-		2013	pp. 18-19
G4-29	Date of most recent previous report	■	-	2013	2012	2012
G4-30	Reporting cycle	■	-	Annual	Annual	Annual
G4-31	Contact persons	■	-			p. 110
G4-32	Table identifying the location of the Standard disclosures in the report and External Assurance report	■	-			pp. 18-33
G4-33	External validation	■	-			Deloitte

GRI N°	Standard Disclosure	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
6. Governance						
G4-34	Governance structure	▣	-		pp. 16-18, 164-196	
G4-35	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees.	-	-			
G4-36	The positions with responsibility for economic, environmental and social topics report directly to the highest governance body.	■	-	pp. 9-14		pp. 6-9, 12
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics	-	-			
G4-38	Composition of the highest governance body and its committees	▣	-		pp. 16-18, 164-196	
G4-39	The Chair of the highest governance body is also an executive officer	■	-		pp. 16-18, 164-196	
G4-40	Nomination and selection processes for the highest governance body and its committees	▣	-		pp. 16-18, 164-196	
G4-41	Processes for the highest governance body to ensure conflicts of interest are avoided and managed.	▣	-		pp. 16-18, 164-196	
G4-42	The highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts.	-	-			
G4-43	The measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics.	▣	-			pp. 8-15
G4-44	Evaluation of the highest governance body's performance with respect to governance of economic environmental and social topics	▣	-	pp. 9-14	pp. 149-161	
G4-45	The highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities.	▣	-	pp. 9-14	pp. 149-161	
G4-46	The highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental and social topics.	-	-			
G4-47	the frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities.	▣	-			pp. 8-13
G4-48	the highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material Aspects are covered.	▣	-			pp. 6-9
G4-49	Process for communicating critical concerns to the highest governance body.	-	-			
G4-50	Nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used to address and resolve them.	-	-			
G4-51	The remuneration policies for the highest governance body and senior executives	▣	-		pp. 181-187	
G4-52	The process for determining remuneration	▣	-		pp. 181-187	
G4-53	How stakeholders' views are sought and taken into account regarding remuneration, including the results of votes on remuneration policies and proposals, if applicable.	-	-			

GRI N°	Standard Disclosure	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
6. Governance						
G4-54	Ratio of the annual total compensation for the organization's highest-paid individual in each country of significant operations to the median annual total compensation for all employees (excluding the highest-paid individual) in the same country.	-	-			
G4-55	ratio of percentage increase in annual total compensation for the organization's highest-paid individual in each country of significant operations to the median percentage increase in annual total compensation for all employees (excluding the highest-paid individual) in the same country.	-	-			
7. Ethics and Integrity						
G4-56	Organization's values principles, standards and norms of behavior such as codes of conduct and code of ethics	■	0	Principle 10, pp. 7, 16-25		p. 91
G4-57	Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity such as helplines or advices lines.	▣	0	Principle 10, pp. 7, 16-25		p. 91
G4-58	Internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines.	▣	0	Principle 10, pp. 7, 16-25		p. 91

GRI N°	Indicators	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
ECONOMIC						p. 34
Sustainable Portfolio Management						
	Context and Methodology	■	O			p. 35
	Assessment scope and planning - Product portfolio	■	O			p. 36
	Assessment results per category - Product portfolio	■	O			p. 36
	Assessment results for the "Aligned and Star" category - Product portfolio	■	O			p. 37
	Assessment results - Innovation portfolio	■	O			p. 38
Research and Innovation Management						
	Expenditure efforts in innovation	■	F			p. 39
	Sustainable innovation highlights in 2013	■	F			p. 40
	Research & Innovation staff	■	-			p. 41
	Open Innovation	■	-			p. 42
	Innovation output	■	F			p. 42
	New sales ratios	■	F			p. 42
Economic performance						
G4-EC1	Direct economic value generated and distributed	▣	F			p. 43
G4-EC2	Financial implications, risks and opportunities due to climate change	▣	F	Principle 7, pp. 5, 26-30		p. 45
G4-EC3	Coverage of the organization's defined benefit plan obligations	-	-			
G4-EC4	Financial assistance received from government	-	-			
Market Presence						
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation	-	-	Principle 6, p. 5		
G4-EC6	Proportion of senior management hired from the local community at significant locations of operation	-	-	Principle 6, p. 5		
Indirect Economic Impacts						
G4-EC7	Development and impact of infrastructure investments and services supported	-	-			
G4-EC8	Significant indirect economic impacts, including the extent of impacts	-	-			
Procurement Practices						
G4-EC9	Proportion of spending on local suppliers at significant locations of operation	NA	-			

GRI N°	Indicators	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
ENVIRONMENT						p. 46
Environmental Management						
	Environmental Management	■	O	pp. 5, 26-30		p. 48
	Compliance and environmental improvement programs	■	O	pp. 5, 26-30		p. 48
Materials						
G4-EN1	Materials used by Weight or volume	▣	–	Principle 7 & 8, pp. 5, 26-30		p. 50
G4-EN2	Percentage of materials used that are recycled input materials	▣	–	Principle 8, pp. 5, 26-30		p. 51
Energy						
G4-EN3	Energy consumption within the organization	■	F	Principle 7 & 8, pp. 5, 26-30		p. 51
G4-EN4	Energy consumption outside of the organization	–	–	Principle 8, pp. 5, 26-30		
G4-EN5	Energy Intensity	■	F	Principle 8, pp. 5, 26-30		p. 52
G4-EN6	Reduction of energy Consumption	▣	F	Principle 8 & 9, pp. 5, 26-30		p. 52
G4-EN7	Reductions in energy requirements of products and services	–	–	Principle 8 & 9, pp. 5, 26-30		
Water						
G4-EN8	Total water withdrawal by source	■	F	Principle 7 & 8, pp. 5, 26-30		p. 53
G4-EN9	Water sources significantly affected by withdrawal of water	–	–	Principle 8, pp. 5, 26-30		
G4-EN10	Percentage and total volume of water recycled and reused	–	–	Principle 8, pp. 5, 26-30		
Biodiversity						
G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	NA	–	Principle 8, pp. 5, 26-30		
G4-EN12	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	▣	O	Principle 8, pp. 5, 26-30		p. 55
G4-EN13	Habitats protected or restored	▣	O	Principle 8, pp. 5, 26-30		p. 55
G4-EN14	Total number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk	–	–	Principle 8, pp. 5, 26-30		
Emissions						
G4-EN15	Direct Greenhouse Gas Emissions (Scope 1)	■	F	Principle 7 & 8, pp. 5, 26-30		p. 56
G4-EN16	Energy indirect Greenhouse Gas emissions (Scope 2)	■	F	Principle 7 & 8, pp. 5, 26-30		p. 56
G4-EN17	Other indirect greenhouse gas (GHG) emissions (Scope 3)	▣	F	Principle 7 & 8, pp. 5, 26-30		p. 57
G4-EN18	Greenhouse Gas Emissions Intensity	■	F	Principle 8, pp. 5, 26-30		p. 58
G4-EN19	Reduction of Greenhouse Gas Emissions	■	F	Principle 8 & 9, pp. 5, 26-30		p. 58
G4-EN20	Emissions of ozone-depleting Substance (ODS)	■	F	Principle 7 & 8, pp. 5, 26-30		p. 58
G4-EN21	NO _x , SO _x , And other significant air emissions	■	F	Principle 7 & 8		p. 58

■ Fully ▣ Partly – Not reported NA Not applicable // F : Financial O : Operational

GRI Index

GRI N°	Indicators	Level of fulfilment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
ENVIRONMENT						
Effluents and waste						
G4-EN22	Total water discharge by quality and by destination	▣	F	Principle 8, pp. 5, 26-30		p. 60
G4-EN23	Total weight of waste by type and disposal method	■	F	Principle 8, pp. 5, 26-30		p. 62
G4-EN24	Total number and volume of significant spills	▣	F	Principle 8, pp. 5, 26-30		p. 64
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Base I Convention 2 Annex I, II, III, and VIII, and percentage of transported waste shipped internationally	–	–	Principle 8, pp. 5, 26-30		
G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff	–	–	Principle 8, pp. 5, 26-30		
Soil Management						
	Soil Management	■	O			p. 65
Products and services						
G4-EN27	Extent of impact mitigation of environmental impacts and services	▣	O	Principle 7, 8 & 9, pp. 5, 26-30		p. 67
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category	▣	O	Principle 8, pp. 5, 26-30		p. 67
Compliance						
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	–	–	Principle 8, pp. 5, 26-30		
Transport						
	Transport safety	■	O			p. 69
G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce	–	–	Principle 8, pp. 5, 26-30		
Overall						
G4-EN31	Total environmental protection expenditures and investments by type	–	–	Principle 7, 8 & 9, pp. 5, 26-30		
Supplier Environmental Assessment						
G4-EN32	Percentage of new suppliers that were screened using environmental criteria	▣	O	Principle 8, pp. 5, 26-30		pp. 70, 93
G4-EN33	Significant actual and potential negative environmental impacts in the supply chain and actions taken	–	–	Principle 8, pp. 5, 26-30		
Environmental Grievance Mechanisms						
G4-EN34	Number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms	–	–	Principle 8, pp. 5, 26-30		

■ Fully ▣ Partly – Not reported NA Not applicable // F: Financial O: Operational

GRI N°	Indicators	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
SOCIAL						p. 72
LABOR PRACTICES AND DECENT WORK						p. 74
Employment						
G4-LA1	Total number and rates of new employee hires and employee turnover by age group, gender and region	▣	0	Principle 6, pp. 5, 20-25		p. 76
G4-LA2	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	-	-			
G4-LA3	Return to work and retention rates after parental leave, by gender	-	-	Principle 6, p. 5		
Labor / Management relations						
G4-LA4	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	-	-	Principle 3, pp. 5, 20-25		
Occupational Health and safety						
	Management of personnel well-being & stress	■	0			p. 78
	Group Standards and medial follow-up	■	0			p. 79
	Health awareness programs at sites	■	0			p. 79
	Human and organizational factors for safety	■	0			p. 80
	Management of systems for occupational safety	■	0			p. 81
	Process safety	■	0			p. 82
G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety programs	-	-			
G4-LA6	Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	▣	0			p. 83
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	■	0			p. 85
G4-LA8	Health and safety topics covered in formal agreements with trade unions	■	0			p. 86
Training and education						
G4-LA9	Average hours of training per year per employee by gender, and by employee category	■	0	Principle 6, pp. 5, 20-25		p. 87
G4-LA10	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	■	0			p. 87
G4-LA11	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	■	0	Principle 6, pp. 5, 20-25		p. 88
Diversity and Equal Opportunity						
G4-LA12	Indicator of diversity	▣	0	Principle 6, pp. 5, 20-25		p. 89

GRI N°	Indicators	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
LABOR PRACTICES AND DECENT WORK						
Equal Remuneration for Women and Men						
G4-LA13	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	▣	0	Principle 6, pp. 5, 20-25		p. 90
Supplier Assessment for Labor Practices						
G4-LA14	Percentage of new suppliers that were screened using labor practices criteria	▣	0			p. 90
G4-LA15	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken	-	-			
Labor Practices Grievance Mechanisms						
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	-	-			
HUMAN RIGHTS						p. 92
Investment						
G4-HR1	Total number and percentage of significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	-	-	Principle 2, pp. 4, 16-19		
G4-HR2	Total hours of employee training on human rights policies or procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained	-	-	Principle 1, pp. 4, 16-19		
Non-discrimination						
G4-HR3	Total number of incidents of discrimination and corrective actions taken	-	-	Principle 6, p. 5, 16-19		
Freedom of Association and Collective Bargaining						
G4-HR4	Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and measures taken to support these rights	▣	0	Principle 3, pp. 5, 20-25		p. 92
Child Labor						
G4-HR5	Operations and suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	-	-	Principle 5, pp. 5, 16-25		
Forced or Compulsory Labor						
G4-HR6	Operations and 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	-	-	Principle 4, pp. 5, 16-25		

GRI N°	Indicators	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
HUMAN RIGHTS						
Security Practices						
G4-HR7	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations	-	-	Principle 1, pp. 4, 16-19		
Indigenous Rights						
G4-HR8	Total number of incidents of violations involving rights of indigenous peoples and actions taken	-	-	Principle 1, pp. 4, 16-19		
Assessment						
G4-HR9	Total number and percentage of operations that have been subject to human rights reviews or impact assessments	-	-	Principle 1, pp. 4, 16-19		
Supplier human right Assessment						
G4-HR10	Percentage of new suppliers that were screened using human rights criteria	■	0	Principle 2, pp. 4, 16-19		p. 93
G4-HR11	Significant actual and potential negative human rights impacts in the supply chain and actions taken	-	-	Principle 2, pp. 4, 16-19		
Human Rights Grievance Mechanisms						
G4-HR12	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	-	-	Principle 1, pp. 4, 16-19		
SOCIETY p. 94						
Local communities						
	Corporate philanthropy and charities	■	0			p.94
G4-S01	Percentage of operations with implemented local community engagement, impact assessments, and development programs	■	0	Principle 1, pp. 4, 16-19		p. 95
G4-S02	Operations with significant actual or potential negative impacts on local communities	-	-	Principle 1, pp. 4, 16-19		
	Awards and recognitions	■	0			p.96
Anti-Corruption						
G4-S03	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	-	-	Principle 10, pp. 7, 31-34		
G4-S04	Communication and training on anti-corruption policies and procedures	■	0	Principle 10, pp. 7, 31-34		p. 98
G4-S05	Confirmed incidents of corruption and actions taken	-	-	Principle 10, pp. 7, 31-34		
Public Policy						
G4-S06	Total value of political contributions by country and recipient/beneficiary	NA	-	Principle 10, pp. 7, 31-34		p. 98

GRI N°	Indicators	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
SOCIETY						
Anti-competitive Behavior						
G4-S07	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	▣	0			p. 99
Compliance						
G4-S08	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	▣	0			p. 99
Supplier Assessment on Society						
G4-S09	Percentage of new suppliers that were screened using criteria for impacts on society	▣	0			p. 100
G4-S010	Significant actual and potential negative impacts on society in the supply chain and actions taken	-	-			
Grievance Mechanisms for Impacts on Society						
G4-S011	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	▣	0			p. 100
PRODUCT RESPONSIBILITY						
Product stewardship						
	Management of Product Stewardship	■	0			p. 101
Sustainable products and solutions						
	Energy saving	■	0			p. 102
	Water management	■	0			p. 102
	Cleaner environment	■	0			p. 103
Customer Health and Safety						
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	▣	0			p. 104
G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle, by type of outcomes	-	-			
Product and Service Labeling						
G4-PR3	Type of product and service information required by the organization's procedures for product and service information and labeling, and percentage of significant product and service categories subject to such information requirements	▣	0			p. 106
G4-PR4	Number of incidents of non-compliance with regulation	-	-			
G4-PR5	Results of surveys measuring customer satisfaction	NA	-			

GRI N°	Indicators	Level of fulfillment	Perimeter	UN Global Compact Principles	Annual Report	Sustainable Development Report
PRODUCT RESPONSIBILITY						
Marketing and communications						
G4-PR6	Sale of banned or disputed products	▣	0			p. 107
G4-PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship, by type of outcomes	-	-			
Customer Privacy						
G4-PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	NA	-			
Compliance						
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	-	-			

Solvay SA/NV

Limited assurance report of the Statutory Auditor on a selection of social, environmental and other sustainable development information for the year ended 31 December 2013

Pursuant to your request and in our capacity of Statutory Auditor of Solvay SA, we hereby present you our limited assurance report on a selection of social, environmental and other sustainable development information disclosed in sections "1.7 2013 Solvay Way results", "2.4 Economic contents", "2.5 Environmental contents", "2.6 Social contents" of Solvay Group Sustainable Development Report for the year ended 31 December 2013 (the "2013 Sustainable Development Report"), identified by the symbol .

■ Responsibility of the Company

This selection of information (the "Information") extracted from the 2013 Sustainable Development Report has been prepared under the responsibility of Solvay Group management, in accordance with internal measurement and reporting principles used by Solvay Group (the "Reporting Framework"). The Reporting Framework consists of specific definitions and assumptions that are summarized in section "2.1 Scope and perimeter of reporting" of the 2013 Sustainable Development Report.

■ Responsibility of the Statutory Auditor

It is our responsibility, based on the procedures performed by us, to express limited assurance on whether the Information identified by the symbol  in the 2013 Sustainable Development Report is prepared, in all material respects, in accordance with the Reporting Framework.

We conducted our procedures in accordance with the international standard as defined in ISAE (International Standard on Assurance Engagements) 3000¹. With respect to independence rules, these are defined by the respective legal and regulatory texts as well as by the professional Code of Ethics, issued by the International Federation of Account ("IFAC").

■ Nature and scope of procedures

We have carried out the following procedures to obtain limited assurance on whether the Information selected by Solvay and identified by the symbol  in the 2013 Sustainable Development Report does not contain any material errors that would question its preparation, in all material respects, in accordance with the Reporting Framework. A higher level of assurance would have required more extensive procedures.

We performed the following procedures:

- We assessed the appropriateness of the Reporting Framework with respect to its relevance, completeness, neutrality, clarity and reliability, by taking into consideration, when relevant, the sector reporting practices.
- We have verified the set-up within Solvay Group of the process to obtain, consolidate and check the selected Information with regard to its completeness and consistency. We have familiarized ourselves with the internal control and risk management procedures relating to the compilation of the information. We have conducted interviews with individuals responsible for social, environmental and other sustainable development reporting.
- Concerning the selected Information²:
 - For the entity in charge of their consolidation, as well as for the controlled entities, we have designed analytical procedures and verified, using sampling techniques, the calculations as well as the consolidation of this information.
 - At the sites that we have selected³ based on their activity, their contribution to consolidated indicators, their location and a risk analysis, we have:
 - Conducted interviews to verify the proper application of procedures and obtained information to perform our verifications;
 - Conducted substantive tests, using sampling techniques, to verify the calculations performed and reconcile data with supporting evidence.

■ Qualification

The indicator “Average number of learning hours per year per employee” comprises a significant degree of error because of the lack of reporting process maturity and incompleteness of the reported data.

■ Conclusion

On the basis of the procedures performed by us and subject to the above-mentioned qualification, nothing came to our attention that causes us to believe that the Information identified by the symbol  as included in Solvay Group Sustainable Development Report for the year ended 31 December 2013, is not prepared, in all material respects, in accordance with the Reporting Framework.

Diegem, 4 April 2014

The Statutory Auditor



DELOITTE Bedrijfsrevisoren / Reviseurs d'Entreprises

BV o.v.v.e. CVBA / SC s.f.d. SCRL

Represented by Eric Nys

¹ ISAE 3000 – Assurance engagements other than audits or reviews of historical information

² **Social information:** Employment by region (FTE), Distribution of employees by hierarchical level, Age pyramid, Hirings per region, percentage of female employees per management level, percentage of female employees (total headcount), Accident frequency rate – Lost Time Accident Rate (LTAR) – employees, Accident frequency rate – Medical Treatment Accident Rate (MTAR) – employees and contractors, Number of fatal accidents – employees and contractors, Average number of learning hours per year per employee, Number of remaining level 1 risk situations under 1 year old

Environmental information: Energy consumption, Water intake - Groundwater + drinking water, Intake of surface water, Intake of underground water, Intake of estuary and sea water, Direct & indirect CO₂ emissions (scopes 1 & 2), Other greenhouse gases (Kyoto Protocol) emissions (scope 1), Total greenhouse gases (Kyoto Protocol) emissions, Other greenhouse gases (non-Kyoto Protocol) emission (scope 1), Ozone Depletion – ODP, Acidification, Photochemical oxidant formation (POF) emissions, Non Methanic Volatile Organic Compounds (NMVOC), Sulfur oxides – SO_x emissions, Nitrogen oxides – NO_x, Dust emissions, Chemical Oxygen Demand - COD emissions, Nitrogen emissions to water, Phosphorus emissions to water, Heavy metals emissions to water, Eutrophication (water entry), Total industrial hazardous waste (tons), Total industrial non-hazardous waste (tons)

Information related to Sustainable Portfolio Management (SPM): revenue covered by the “market alignment” assessment, revenues of Product-Application Combinations in the “Aligned” and the “Star” categories

Information related to Solvay Way: deployment of Solvay Way on the ground, scope of Solvay entities covered by the Solvay Way assessment and alignment with ISO 26000 guidelines.

³ Dombasle-sur-Meurthe (France), La Rochelle (France), Chalampé (France), Roussillon (France), Orange (USA), Vernon (USA), Torrelavega (Spain), Zhenjiang (China), Santo Andre (Brazil) (Non Methanic Volatile Organic Compounds (NMVOC) emissions only)

Economic Contents

Sustainable Portfolio Management (SPM)	35
Research & Innovation Management	39
Economic performance	43

Sustainable Portfolio Management (SPM)

a. Context and Methodology

■ Being a strong leader in sustainable and responsible chemistry

In order to deliver on this very ambitious vision, well-informed and balanced decisions need to be made regarding resource allocation and balancing the business portfolio. This is the *raison d'être* of the SPM methodology: systematically, robustly and rigorously developing the information that decision makers need when making their judgments, with one eye on sustainability megatrends in the outside world that may positively or negatively affect Solvay's top and bottom lines.

The SPM strategic toolkit effectively and simultaneously spotlights:

- **Operations Vulnerability** (vertical axis): the risks and opportunities of products in relation to the environmental footprint of their manufacturing processes;
- **Market Alignment** (horizontal axis): the extent to which the product(s) are ultimately part of the solutions that consumers seek when addressing their own sustainability and responsibility concerns.

■ Closely embedded in key group processes

The SPM methodology thus serves as a strategic tool to develop information on and analyze the impacts of sustainability megatrends on our businesses. It is integrated into the Solvay Way framework (3 commitments and 7 practices) and interacts with corporate processes that directly impact the business portfolio; such as strategic planning, merger and acquisition, investment and research & innovation. 2 of the 13 SD objectives are directly measured with the SPM tool: the balancing of the business portfolio towards sustainability and the allocation of resources in Research and Innovation (see page 36). Ultimately the information revealed by the SPM evaluations complements the "usual" elements that the Executive Committee, the Global Business Units (GBUs) and the corporate functions need to prioritize resource allocation (capital expenditure, research and innovation projects) and make strategic decisions (acquisitions, divestments).

■ In close cooperation with the GBU and the corporate functions

The SPM methodology was devised in-house in 2009 and developed further with the support of two authoritative consultancies, Arthur D. Little and TNO, because no such simple yet robust methodology existed at the time. It has been continuously improved since 2009 in order to make more pertinent and reliable SPM evaluations at Product-Application Combinations (PACs) level. One such example:

- Adipic acid (the product) is a raw material used in the manufacturing of polyamide 6.6;
- Polyamide 6.6 is a lightweight product ultimately used to manufacture support mechanically stressed parts under the hood of an automobile (the application), thus reducing the weight of the car and thereby increasing its energy efficiency.

In practice, an SPM work plan is discussed every year with each GBU. Priorities and workloads are defined, based on the results of the SPM evaluation of the previous year and including any new elements in the market place, legal regulations, etc. The evaluations are carefully prepared in close consultation with the Solvay Way Champion of the GBU and realized in workshops with GBU experts: strategy, marketing and technical service are covered by the **Market Alignment** indicator in the SPM, with all industrial aspects analyzed in the **Operation Vulnerability** analysis:

- The **Operations Vulnerability** indicator evaluates any potential financial risk posed by the "polluter pays for the damage" megatrend. The basic evaluation begins with a classic ecoprofile calculation (ISO 14040 to 44). The environmental impacts are monetized, summarized and evaluated against the average sales price for that product in that application (the intent is to reflect SD issues and not short-term market prices). Solvay has decided not to communicate the results of those evaluations, which represent highly sensitive material from a competition perspective;
- The **Market Alignment** indicator addresses the sustainability megatrends in the marketplace: i.e., do we anticipate double-digit growth for this product because it is an active part of the sustainable solution that the market (i.e. the consumer) demands? The reader is referred to page 40 for practical examples.

The consolidated results of the SPM assessments are presented to and endorsed by the Executive Committee. In face-to-face meetings personalized feedback is given to presidents of the Global Business Units (GBUs) and their staff to enable them to incorporate the lessons learned into their strategy.

■ Enlarge the scope

Significant improvements have been made to the SPM tool in the last year. Whereas previously it addressed only basic conditions for life and the basic needs of human beings on planet Earth, this year the market alignment questionnaire of the SPM methodology now also covers their wellbeing and quality of life- an integration made possible with the help and support of Arthur D. Little. The criteria that have been added are listed in the table on page 37.

■ Create shared value

Up to now, Solvay considered that keeping the SPM methodology in-house represented a competitive advantage, enabling it to proactively incorporate sustainability megatrends into its strategy and resource allocation decision-making process.

Having applied the SPM methodology to its ongoing operations and its recent Rhodia acquisition, Solvay considers there to be significant value in other companies adopting the same approach, in addition to the benefits for Solvay itself:

- in further improving the methodology through having it challenged by other companies, not only chemists;
- in creating progressive consistent benchmarks.

Arthur D. Little, one of its co-developers, is the vehicle for propagating the SPM methodology. Solvay and Arthur D. Little will organize appropriate pre-competitive opportunities where the SPM methodology can be discussed and expertise and experiences shared.

b. Assessment scope and planning - Product portfolio

 The SPM tool has been widely deployed in Solvay legacy since 2010 and has been progressively deployed in Rhodia legacy since 2012. By the end of 2013, 64% of both legacies' revenue had been assessed from a market alignment perspective, which is almost double the previous year's figure (35%) and ahead of schedule. By mid-2015, 80% of Group revenue will have been assessed.



Perimeter: SPM operational perimeter: entities are fully consolidated or proportionately consolidated in the case Solvay isn't the sole owner.

Legend: SPM penetration expressed as the ratio of the operational turnover assessed with the SPM methodology to the total operational turnover.

Solvay's 2015 target:

➔ To evaluate 80% of Solvay turnover with the SPM methodology.

Why operational and not a purely financial reporting perimeter?

Solvay wants to make decisions informed by sustainability on all its activities, not just the activities it directly operates itself and that are consolidated in its financial reporting perimeter. This explains the choice to include operational perimeter data in the SPM indicators. The sustainability opportunities and risks are the same, whether or not the activities appear in the financial participations section in the balance sheet.

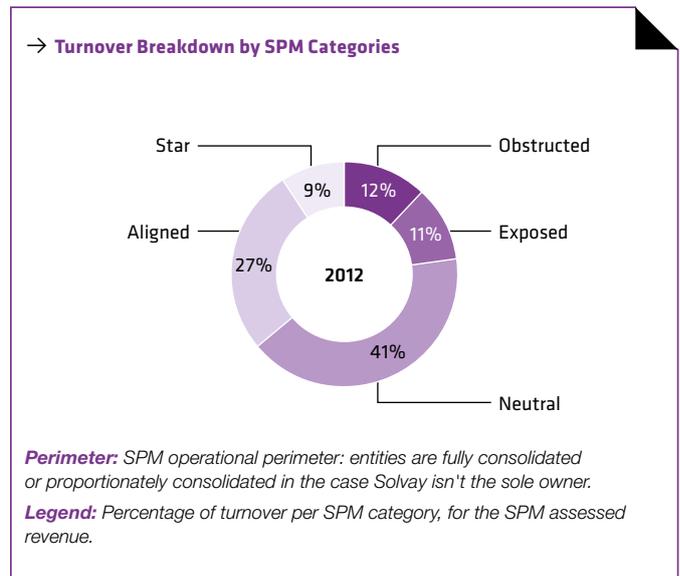
c. Assessment results per category - Product portfolio

Solvay wants to provide solutions that match the sustainability needs of the marketplace: not only "obvious" solutions such as biodegradable products for soaps and shampoos or renewable-based solvents for paints and coatings, or more complex solutions that ultimately enable consumers to reduce their energy consumption or the amount of food waste they generate, to limit the impact of aging, or to increase the amount of medical treatment given at home etc.

■ SPM categories:

SPM assessment is made at the Product-Application Combination (PAC) level.

- **Star:** PAC for which there are positive signals, in line with sustainability trends in the marketplace, with anticipated double-digit growth;
- **Aligned:** PAC for which there are positive signals resulting from sustainability trends in the marketplace;
- **Neutral:** for which there are neither positive nor negative signals resulting from sustainability trends in the marketplace;
- **Exposed:** PAC for which there are weak negative signals resulting from sustainability trends in the marketplace;
- **Obstructed:** PAC for which there are strong negative signals resulting from sustainability trends in the marketplace.



Solvay's 2020 target:

➔ To reach 20% of "Product-Application Combinations" in the "Star" category, i.e. in markets expected to experience double-digit growth for sustainability reasons.

 The assessed portfolio encompasses 27% of Product-Application Combinations in the "Aligned" category and 9% into the "Star" (up from 6% the previous year). Together, this 36% (same as last year) of revenue represents "Product-Application Combinations" which match solutions sought by customers to improve their sustainability profile and ultimately deliver environmental benefits to end consumers.

Over the last year, the main focus has been on assessment of the "new" Solvay entities (former Rhodia legacies) and improving the cross-references between the commercial reporting systems and the turnover allocation to SPM PACs. The commercial reporting systems tell us how much revenue has been generated in one year for hydrogen peroxides, used by the pulp & paper industry, but the evaluations are made at consumer level (paper for magazine, for reprography, or for tissues, paperboard for packaging etc.). The cross-references are continuously improved as they are monitored within the Business Intelligence (BI) process of the GBUs: for example, each time the GBU receives updated information about Hydrogen Peroxide sales used in reprography paper the accuracy of both the information systems (BI and SPM) are improved simultaneously.

■ How sustainability trends in the market are taken into account in the SPM methodology

To be classified as “Star” or “Aligned”, products must serve a use that demonstrates a direct, significant and measurable benefit to the market, impacting positively upon at least one of the sustainability megatrends below, without any sustainability roadblock:

Essential living conditions	Living well
Climate change	Medical care
Energy efficiency	Chronic diseases
Exposure to harmful and toxic substances	Limitation of the effects of aging
Resource efficiency	Medical care at home
Fresh water	Water & air quality
Renewable materials	Safety & prevention
Availability of food	Healthy nutrition
Renewable energy	Healthy habits
Biodegradability	Topical care
Recyclability	
Waste treatment	
Minimizing use of scarce inputs	

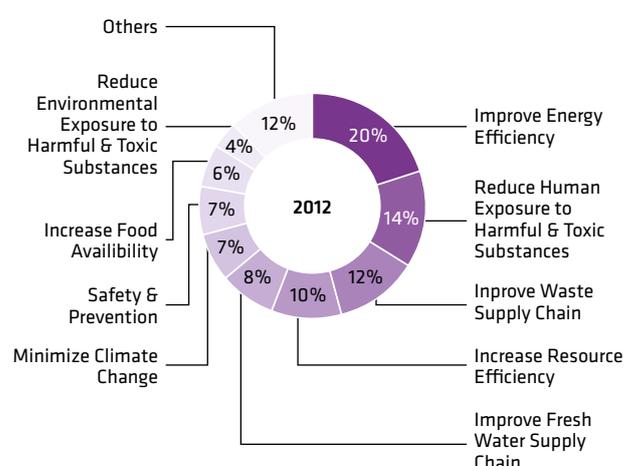
Legend: List of the SPM benefits.

Authoritative external evidence supports the benefits of this sustainability approach at PAC level. It is not enough to have a renewable-sourced product in our portfolio; we have to demonstrate that it also matches a specific need for that renewable-based product in the marketplace. As an example, renewable-source epichlorohydrin (Epicerol® process) exhibits a specific benefit when used in epoxy coating as it matches AkzoNobel’s sustainability needs (and ultimately those of the consumers), but does not represent such a benefit when used in epoxy resins for printed circuit board laminates, as no sustainability need has been identified for this application.

d. Assessment results for the “Aligned and Star” category - Product portfolio

What are the sustainability issues that Solvay is tackling with the 36% of its turnover that is classified as Star or Aligned? As a reminder, the classification requires a product to represent a direct, significant and measurable sustainability benefit, to be evidenced by authoritative elements, without raising any sustainability concerns.

→ Turnover Breakdown by Sustainability Benefit for Aligned and Star SPM Categories



Perimeter: SPM operational perimeter: entities are fully consolidated or proportionately consolidated in the case Solvay isn't the sole owner.
Legend: Breakdown of the Benefits behind the Aligned and Star PACs.

"To become a model in sustainable chemistry" ...

The SPM tool is supporting the Group in its strategic sustainability objectives:

- to have a balanced portfolio of activities in terms of sustainability;
- to increase the proportion of products in the “Aligned” and “Star” categories.

... combined with the Group’s strategic objectives:

The SPM tool is supporting the Group in its strategic sustainability objectives:

- to focus on Research & Innovation and develop solutions to key societal challenges;
- to reinforce investment in regions and market segments with high growth potential;
- to develop operational excellence in all areas, in order to consolidate its competitiveness and leadership.

e. Assessment scope and planning - Innovation portfolio

With the merger of the Solvay and Rhodia legacies, two tools for measuring the sustainability alignment of Research & Innovation existed side-by-side:

- the Sustainable Portfolio Management (SPM);
- the Sustainability Index (SI).

In 2012 and 2013, a team composed of experts from both methodologies systematically examined every component of both "historic" tools and constructed a new methodology incorporating their respective strengths. The new SPM 2.1 methodology was born and has already been honored by the 150th Anniversary Innovation Award in the Managerial category.

From January 2014, all Research & Innovation project activities will be assessed by this new SPM 2.1 methodology. As it includes key features of both the Sustainability Index (SI) and of the "old" SPM tools, it is anticipated that 80% or more of the information which needs to be collected in order to assess projects with SPM 2.1 will already be available - taken from the "old" tools and reused. The new methodology has been formally validated by the Presidents of R&I and SD functions following two successful pilots programs.

SPM 2.1 will be applied progressively from January 2014 to any new R&I project and to any R&I project that is changing phase (i.e. crossing a gate, in a classical stage-gate process).

Solvay's 2020 target:

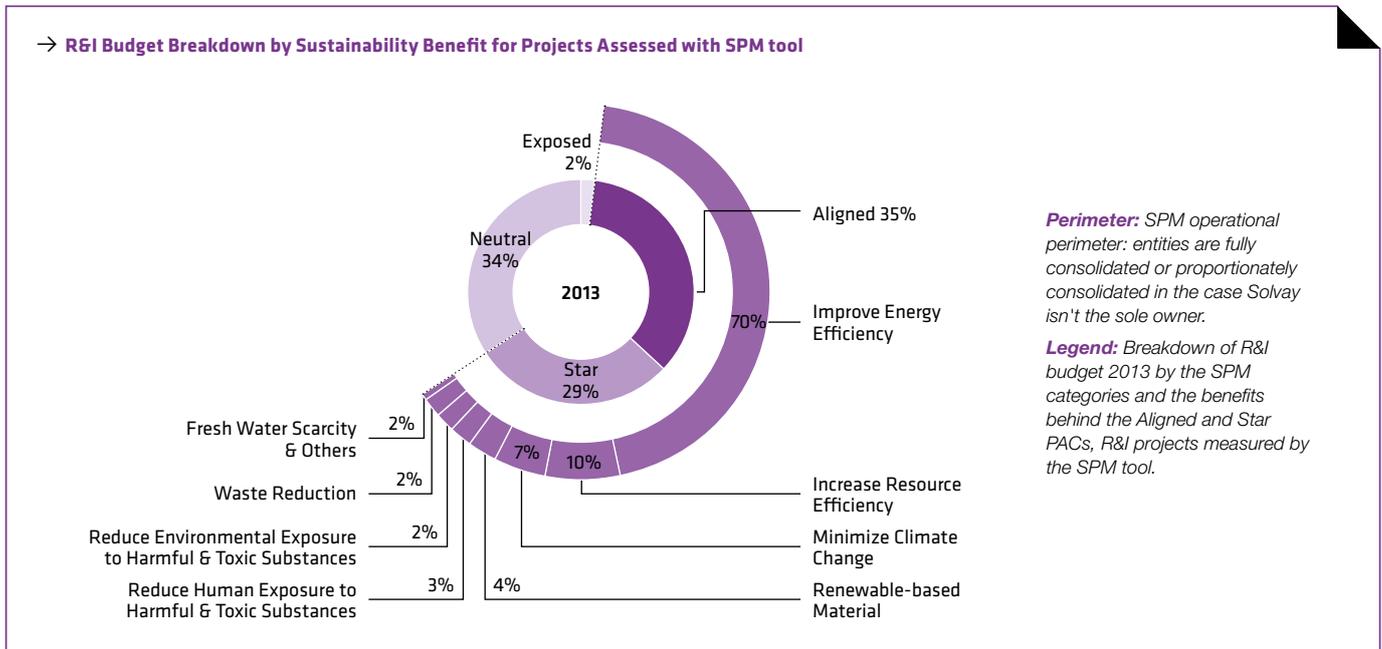
- ➔ To ensure that 100% of R&I resources are spent on projects in the Star or Aligned categories, or projects that significantly decrease the environmental footprint of the upstream value chain (cradle-to-gate).

This will be the last time, therefore, that the sustainability evaluations of each R&I project are reported separately, according to the tool originally used to evaluate them.

f. Assessment results - Innovation portfolio

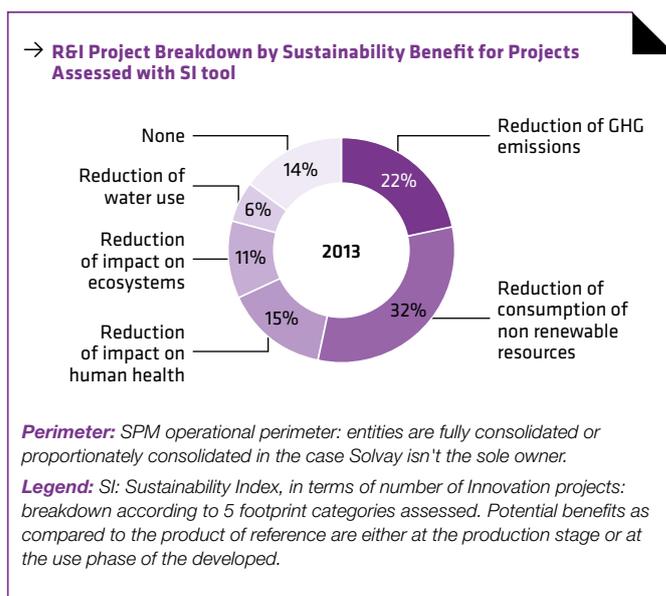
■ With the SPM methodology

A significant part of the R&I pipeline of the Solvay legacy is Star or Aligned, according to the SPM assessment, that is products that will contribute to addressing key sustainability issues, in particular improved energy efficiency and renewable energy. The portion of resources allocated to R&I projects classified as Aligned and Star remains stable compared to 2012 (64%).



■ With the SI methodology

The Sustainability Index (SI) methodology and the structure of the Sustainable Index tool have been reviewed by PwC, who considered SI to be a tool well-suited for an eco-design approach. This tool enables assessments to be reviewed at every gate crossing. From the earliest stages of a R&I project, SI delivers key statistics of the footprint of the future product: CO₂ footprint, consumption of non-renewable resources, impact on human health and ecosystem quality (including water footprint), and provides recommendations for orientating the project towards more environmentally-friendly solutions. The widespread use of this tool was a basic element in Rhodia's legacy of good practice in R&I management. The SI assessments also provide a strong basis for a full lifecycle assessment of the future product or process, which can then be submitted to a critical review for compliance with ISO 14040/44 standards, and subsequently to support product promotion.



In 2013, 90% of the Innovation Project portfolio of Rhodia legacy had been assessed with the SI methodology. Compared to the previous year, the number of projects having no sustainability benefit decreased from 21% to 15%. This is a significant achievement.

Research & Innovation Management

R&I (Research and Innovation) strongly reflects Solvay's ambition to reduce our environmental footprint and to increase the proportion of our revenues that meet the challenges of sustainable development, by providing our customers with high value, innovative and competitive solutions tailored to the present and future needs of end users.

Scarcity of resources, the fight against climate change, soaring consumption in high-growth parts of the world, and new demands for environmental care, health and well-being are the megatrends that determine the main themes of Solvay Research & Innovation policy.

The key drivers of the effort invested in Research and Innovation (R&I) include:

- a process of excellence to improve efficiency and shorten time-to-market;
- the intellectual property obtained, that directly drives Solvay's future differentiation;
- the creation of a sufficiently extended network of open innovation (through partnerships) to maximize efficiency and, most importantly, tap into the creativity and competencies of the outside world.

a. Expenditure efforts in Innovation

Unit	Solvay
Competitiveness & Defense MEUR	67
Growth MEUR	170

Perimeter: Solvay financial perimeter.

Legend: R&I expenses include all expenses, wether 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 labour material costs and outsourced R&I but also, infrastructure, depreciation of R&I equipment, intellectual property costs and are net of R&I tax credits and subsidies. This indicator does not include investments in start-up companies nor capital expenditures.

Research and development costs of €237 million in 2013 represent a 4% reduction compared to restated 2012 costs, but remain unchanged at 2.3% on net sales on a comparable basis. The decrease in costs was compensated for by an increase in capitalized development expenses, with the total cash out for research and development actually increasing by 3% compared to 2012.

A global expenditure analysis clearly underlines that innovation projects are widely focused on growth, with more than 70% of total global spending dedicated to projects focused on growth.

Among these R&I efforts, nearly 40% are oriented towards the development of advanced materials with high added value, providing unique solutions to high-growth markets such as energy, medical applications, water, sustainable mobility and mobile devices.

Economic

The Group has also dedicated 20% of total R&I efforts to corporate activities, with the clear intention of maintaining long-term development projects aimed at building expertise and competencies in emerging technologies or at developing diversification and new business development opportunities through breakthrough innovations. These R&I corporate activities are focused on six areas of innovation identified as crucial for sustainable growth:

1. **Advanced materials:** The Group's expertise in polymers and formulation enables it to design new, lighter, safer and more efficient functional materials.
2. **Sustainable energy:** Solvay is helping to develop alternatives to fossil fuel consumption: new generation batteries, photovoltaics, bio-energy etc.
3. **Organic electronics:** Solvay is developing increasingly affordable, higher performance and resistant materials to improve the sustainability of lighting devices and screens.
4. **Eco-designed processes:** Solvay is developing breakthrough innovations for itself and its clients, offering diminished raw materials and energy consumption, reduced emissions and lower investment costs.
5. **Advanced formulations:** Solvay's formulation expertise is enabling it to create responsible products that provide solutions to global issues or contribute to the health and wellbeing of consumers.
6. **Renewable chemistry:** innovation in renewable or recycled raw materials contributes to the evolution of Group products and processes.

b. Sustainable Innovation highlights in 2013

■ Sustainable Energy/Organic Electronics:

- **Organic Light-Emitting Diodes (OLED):** Further developments in solution-processed OLEDs have been made in collaboration with close partners such as Plextronics and the Holst Center, broadening the range of materials, formulations and technologies that enable solution-processed OLED devices.
- **Launch of the EU-funded collaborative project MAT4BAT dedicated to advanced materials for Li-ion batteries:** Solvay will actively participate until 2017 in this European consortium led by CEA and involving 16 partners. Solvay's contribution will include the fabrication of fluorinated polymers as innovative binders and separators, performance of electrochemical tests and high throughput measurements on electrolytes, and providing innovative fluorinated compounds and salts for more effective electrolytes."
- **Semi-transparent organic photovoltaic (OPV) cell on large area coatings:** Solvay has created the world's largest semi-transparent single OPV cell on large area coating equipment (LACE) in collaboration with Polysolar, a start-up company located in Cambridge (UK) and CPI-PETEC, a technology transfer center for printed electronics (Durham, UK). This proof-of-concept has now been developed into a working demonstration module of a transparent OPV window, which will offer the advantages of energy conservation combined with power generation to meet current and future building standards at a price comparable with existing glazing units.

■ Breakthrough initiatives to enhance energy integration of Polyamides and Intermediates' processes:

The first project, called IRENE was implemented in 2013 at the Olone plant in Chalampé (France), leading to a 9% reduction in the energy bill. Energy integration projects, together with continuous improvements, will enable Solvay Polyamides and Intermediates to be ahead of their target of a 10% improvement by 2020. This project has been supported by Electricité de France and the Alsace region through a joint partnership. IRENE combines environmental protection, economic development and joint action with local communities.

■ Cleaner environment (Advanced formulations, Advanced Materials):

- **Sustainable Chemical solutions for the fast-growing Oil and Gas (O&G) market:** Requirements for fluid viscosifiers used in O&G extraction technologies are becoming more and more demanding. This is not only due to the harsher conditions of today's O&G recovery (higher temperatures, higher salinity) but also to the need to improve the sustainability profile of operations by recycling the process water and using less fresh water. Solvay Novocare is developing and commercializing new generations of surfactant viscosifiers and guar derivatives to address this market need.
- **Demonstration of an innovative fuel additive system for diesel:** This innovation, from Solvay Rare Earth Systems, is key to improved reliability, robustness, cleanliness and flexibility of engines in real field operations, which will aid the automotive industry in reducing its CO₂ emissions. The project, in partnership with SOGEFI, has received the support of the European Commission's LIFE+2012(LIFE 12ENV/FR/000480) program for the next three years.
- **Innovation Portfolio expanded into two new market segments: fertilizer protection and seed boosting:** The innovation portfolio of Solvay Novocare for Agrochemicals Specialties has been expanded into two new market segments: fertilizer protection and seed boosting. To protect urea from decomposition into ammoniac, this fertilizer is treated with a formulation containing NBPT (NButylthioPhosphoric Triamide) as the active ingredient. Previously these formulations contained NMP (NMethylPyrrolidone), which is a toxic solvent. In the new formulations we use Solvay's eco-friendly solvents (glycerol derivatives and di-esters) which are non-toxic and biodegradable. Seed boosting technology based on GSB (Germination Seed Boosting) agro-polymers creates a favorable environment for seeds to germinate and promotes root development. This ultimately results in better crop yields thus providing an answer to one of the megatrends in agriculture: yield improvement.
- **Thermoformable foam for insulative and structural components in aircraft:** Solvay Specialty Polymers has launched the industry's first thermoformable polyphenylsulfone (PPSU) Foam for insulative and structural components used in aircraft interiors. Radel® PPSU foam offers better chemical resistance than competing polymer-based foams and simpler, more affordable part manufacturing than traditional cores.
- **High-performance polyamides for engine cooling components:** The demand for engineering thermoplastics continues to climb as OEMs (Original Equipment Manufacturers) identify new ways to reduce the number and weight of under-the-hood parts to meet tougher CAFE regulations and stricter emissions standards. Polyphthalamide (PPA) has filled an important market need,

bridging the cost and performance gap between high-volume, moderate-performance engineering resins such as thermoplastic polyesters and nylon and low volume, high cost specialty thermoplastics such as polyetheretherketone (PEEK). Compared to standard polyamides, Amodel® AS-1933 HS, a 33% glass filled PPA developed by Solvay Specialty Polymers, has higher thermal capabilities and is stronger, stiffer and less sensitive to moisture. It also retains its excellent mechanical properties, including fatigue and creep resistance, over a broad temperature range in humid and chemically aggressive environments.

- **Allowing lower environmental impact solvents during rubber synthesis:** A new neodymium-based, high performance, sustainable polymerization catalyst precursor for green tire rubber (NdDEHP55) has been launched by Solvay Rare Earth Systems. This technology significantly decreases the effluent stream during manufacturing and enables the use of are less environmentally-damaging solvents in rubber synthesis.

■ Renewable chemistry

- **Investments by Solvay's partner venture capital funds in the Cleantech and Renewable Chemistry sectors:** As an example, Solvay is an investor in Sofinnova Green Seed Fund. This €22.5 million fund supporting innovation in industrial biotechnologies, financed two European SMEs in 2013: Synthace, a synthetic biology bio-manufacturing platform, and Cellucomp, a manufacturer of nanocellulose fibers for composites and paints. Possible uses for these materials in markets where Solvay operates will be explored.
- **Cooperation with 48 laboratories in Brazil for developing renewable chemistry:** Solvay has signed a cooperation agreement with EMBRAPA, a network of 48 laboratories in Brazil linked to the Ministry of Agriculture, for developing renewable chemistry oriented joint-projects in the area.
- **High performance modified wood:** Solvay Acetow and Accsys Technologies PLC confirmed in December a license agreement for Accoya®, a high performance modified wood based on Accsys technology, which converts softwoods and hardwoods into "high technology wood". This modified wood exhibits superior dimensional stability and improved durability when compared with alternative natural, treated and modified woods. Accoya® wood is perfect for external applications, in particular for decking, cladding, siding windows and external doors.
- **A cellulose acetate bio-plastic manufactured using wood pulp:** In October 2013 Solvay Acetow introduced Ocalio™, a cellulose acetate bio-plastic manufactured using wood pulp, an entirely renewable resource obtained from SFI (Sustainable Forestry Initiative) certified forests. This entirely renewable resource does not compete for food resources. Ocalio™ has a bio-based content at present of 50% and has a much lower CO₂ manufacturing footprint when compared to conventional plastics. Ocalio™ can be easily molded and is designed for a wide range of consumer goods end-use such as containers for cosmetics and personal care, electronic devices, toys and mobile phones.
- **Outstanding environmental benefits with 100% recycled Technyl® Eco:** Solvay Engineering Plastics has taken the initiative to launch a cradle to gate life-cycle analysis to determine the environmental footprint of the production of recycled Technyl® A718 V30, a grade based on 100% recycled polyamide, commercialized under the Technyl® Eco brand name. Technyl® Eco is exclusively made of post-industrial polyamide scraps (fibers & yarns) that are first depolymerized,

before being polymerized again prior to transformation into pellets. These pellets are compounded in Solvay Engineering Plastics' São Bernardo plant (São Paulo, Brazil). Thanks to the mechanical performance and durability of Technyl® Eco, Solvay can use it to develop applications requiring pellets with the same weight and design as the ones made from primary polymer. When comparing compounds made out of primary polymer with Technyl® Eco compounds, outstanding results are obtained for the cradle-to-gate assessment: CO₂ footprint is reduced by 69%, and use of non-renewable resources by 76%. Indicators of potential impact on Human Health and Ecosystems also show a significant reduction; water consumption is also dramatically reduced. For 1 ton produced, the savings on CO₂ emissions are equivalent to a 15 000 km (9 320 miles) trip in a gasoline-powered car. For 1 ton produced, the economy of non-renewable primary energy is equivalent to the consumption for the annual production of electricity for 1 person over a 25-year period in Brazil.

- **Preserving renewable resources with Technyl® eXten:** The matrix of Technyl eXten®, developed by Solvay Engineering Plastics, is a partially bio-sourced polyamide. One of its monomers is sebacic acid synthesized from castor oil. This allows a reduced carbon footprint and the preservation of non-renewable resources, while still complying with today's most demanding sustainable development criteria. Due to the vegetable origin of part of its structure, the matrix of Technyl® eXten contains 62.5% of bio-based carbon. As a consequence, Technyl® exten will release less than 1 kg CO₂ eq. of fossil CO₂, as compared to fully petro-sourced Polyamide 12 or 6.6, which will respectively release 2.6 kg CO₂ eq and 2.3 kg CO₂ eq of fossil CO₂ upon their total oxidation.

■ Other developments in sustainable innovation

- New halogen-free flame retardant polyamides for mobile devices (Solvay Specialty Polymers): see page 102.
- Fluorinated polymers for high-performance lithium batteries (Solvay Specialty Polymers and Solvay Aroma Performance): agreement with the Bollorée Group: see page 102.
- Epicero®: one of the world largest "bio-based chemistry" projects (Solvay Emerging Biochemicals): see page 102.
- New plant to produce ethoxy-4,4,4-trifluoro 2 butene-on as a building block for the agrochemical industry (Solvay Special Chemicals): see page 103.
- Producing fluorine gas at the customer premises (Solvay Special Chemicals): see page 103.

c. Research & Innovation staff

	2011	2012	2013
Number of persons (full time equivalent) employed	1793	1907	1948

Perimeter: Include chlorovinyl activities.

Legend: Employees include research engineers and scientists, technicians, laboratory and pilot operators, and employees dedicated to R&I facility management and R&I support.

Economic

Throughout the Group, about 1948 people work in R&I. Solvay's 15 major R&I centers are located across Europe, Asia, North and Latin America.

In 2013, Solvay has confirmed its growing R&I capacities in Asia with:

- Construction of a new R&I center within Ewha University in Seoul, which will primarily focus on Lithium-ion battery and organic electronic development.
- The new R&I center in Vadodara (India) - focused on materials science, and development of new polymers and new products from renewable resources - received the LEED (Leadership in Energy and Environmental Design) Gold Certification from the IGBC (Indian Green Building Council) in 2013. This is the first 'green' building in Solvay.
- Inauguration of the extension of the Shanghai (China) R&I center in 2013, launched to host in particular a polymer processing platform and a food laboratory.

d. Open Innovation

	2011	2012	2013
Intellectual Property (IP) agreements & cooperation agreements	1597	1570	1381

Perimeter: Include chlorovinyl activities.

The number of IP agreements has slightly decreased (around 10%) compared to 2012 due to the reprioritizing of our research projects in line with our six innovation topics. The number of agreements is still very large, highlighting the openness of our innovation whether through collaborations with partners in public research or industry, or nurtured and acquired from equity relationships with start-up businesses:

- Solvay has a long tradition of collaborations with the National Scientific Research Center (CNRS) of France. By teaming up with several Universities, Solvay and CNRS are able to operate in four Joint Research Units in France, in the USA, and in China.
- Solvay further strengthened its scientific cooperation in the field of renewable raw materials with CTBE, the National Scientific and Technological Laboratory in Brazil with a view to developing high added value molecules from sugarcane biomass.
- Solvay worldwide currently drives or participates in almost one hundred collaborative public-private innovation projects supported by public authorities. Such initiatives involve key players from academia and industry, active in the same fields of competence or in the same value chains. These initiatives bring external competencies and technologies to both current and future innovation projects, as well as knowledge and benchmarks on given topics.
- The technological platform Axel'One, co-founded by Solvay in the Lyon area, will open in early 2014 and host collaborative research and innovation projects.
- Solvay is also strongly engaged in excellence institutes IDEEL, PIVERT and TWC, fostering the development of clean processes and advanced materials.
- Innovation opportunities for Solvay can also be created via partnerships with start-ups such as Plextronics, Polyera, Eight19 or ACAL. Investing in start-ups gives Solvay access to new and

complementary high-tech expertise in fields identified as strategic for the Group, such as renewable chemistry, printable electronics, renewable energies or advanced materials and formulations.

- Another way of accessing innovation outside the scope of existing businesses and technologies is participation in venture capital (VC) funds, which are designed to finance a group of young companies in their development phase. Today, Solvay participates in eight VC funds.

e. Innovation output

	2011	2012	2013
Patents	322	300	252

Perimeter: Include chlorovinyl activities.

The New Solvay Intellectual Property (IP) strategy is fostered by strong partnerships between the Intellectual Assets Management Function, GBUs, and the R&I function. The number of patent applications filed, although slightly lower than the exceptional result achieved in 2011, confirms the Group's positive trend towards more patented innovations since 2009 (205 patents). The slight decrease in last year's number of patent applications represents an effort to limit costs and keep a lid on the resources committed to the integration of the Solvay and Rhodia legacies.

f. New sales ratios

	2011	2012	2013
New Sales ratios	22%	23%	22%

Perimeter: Solvay financial perimeter.

The new sales ratio incorporates two components: newly commercialized products or services (products manufactured or services sold for the first time) and significantly improved products or services:

- Significantly or moderately modified products, with a new characteristic perceived by the customer and claimed as such by Solvay.
- Existing products sold thanks to an innovative service which allows either a differentiated offer or a differentiated implementation.
- Existing products sold for a new application or a new market.
- Existing products created by a new process or significantly improved process that gives a new usage value to the customer.

To qualify for inclusion in the ratio, the new or improved product of service must have been brought to market within the last 5 years.

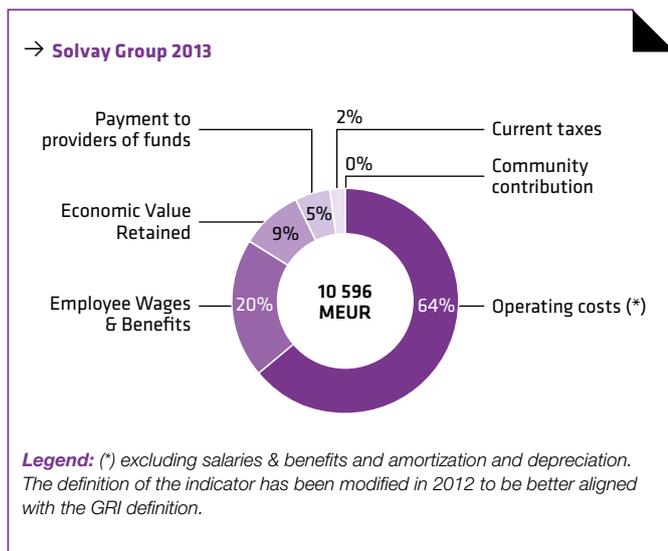
The new sales ratio is calculated by adding the current annual sales of these two components created less than five years ago on the total annual sales.

The date used to measure the age of new products less than 5 years old is the date of effective significant commercialization (date when the category of new product reaches an annual sales volume over €100 000).

Economic performance

G4-EC1 Direct Economic Value Generated and Distributed

■ Distribution of generated value



□ Generation of the economic value

The economic value generated by the Group's activities (10,6 GEUR) includes the sales, interests on lending and short-term deposits, earnings from associates consolidated using the equity method, income from non-consolidated investments and discontinued operations.

□ Redistribution of the economic value

About 64% of the economic value generated is used to cover the operating costs (mainly purchases of raw materials, goods and services)

- 20% is used to pay salaries and benefits;
- 2% for the current taxes;
- 5% is paid to the shareholders and the financial creditors;
- 9% of the economic value generated is retained mostly to invest in tangible and intangible assets.

■ Human capital performance

Solvay considers its employees to be key actors in creating value. As REBITDA is a guiding indicator for its economic success the group follows the economic value created through employees by looking at REBITDA divided per FTE .

The Value created by Employee was 59 150.- EUR in 2012 and 59 000.- EUR in 2013.

The Calculation is based on Financial perimeter excluding contribution from equity affiliates and discontinued operations.

■ Property Loss Prevention

Solvay promotes systematic loss prevention services in all its Business Units and manufacturing plants in order to protect the organization's assets and earnings against potential catastrophic accidental and natural risks. Solvay has specific management systems to prevent accidents and natural catastrophies and reduce their potential consequences if they still happen. The Property Loss Prevention program is primarily focused on protecting economic performance by preventing potential risks of significant Business Interruption and Interdependencies. It also assists Environmental, Social and Society protection by preventing accidental loss of containment.

The Property Loss Prevention policy applies to all Solvay Group industrial sites, either fully owned or belonging to a JV in which Solvay has 50% of the shares and operating control, and within those sites to all industrial installations and equipment. For JV's in which Solvay has less than 50% of the shares or 50% with no operating control it is highly recommended by the Treasury & Insurance Department to perform Property Loss Prevention visits in agreement with the partners and to verify that no unacceptable risk exposures exist.

The policy also applies to installations and equipment owned 50% or more by Solvay and located on third party sites.

By the end of 2013, 87 property loss prevention visits (regular and special visits) had been performed representing an investment of 8 250 field engineering hours. Consequently, 232 recommendations were made for a loss expectancy reduction of €1 723 160 884.

In addition, 40 project reviews were performed (on 29 sites) allowing new property loss prevention recommendations to be presented in order to mitigate risks before the start-up of new activities. Solvay will maintain its investment in Property Loss Prevention through plant visits and project reviews and will reinforce its efforts with regular Risk Improvement visits.

The Property Loss Prevention program will be reinforced using 2 key tools: risk improvements visits and training courses. In liaison with the external risk engineers, Solvay will set up Risk Improvement visits to support sites in prioritizing recommendations. It will also provide training courses for critical recommendations. Training courses and Risk Improvement visits will be performed on a selective basis in all zones and for all critical plants and businesses.

Our policy:

Solvay promotes systematic Property Loss Prevention at its manufacturing plants. Programs are carried out to bring recently acquired plants and new projects up to Group standards.

□ Property Loss Prevention and the role of the corporate teams

Property Loss Prevention is the responsibility of sites, with support available from:

- The Treasury & Insurance Department;
- The Industrial function;
- The Business Unit Management;
- their networks of external risk engineers and consultants, who identify risks, make recommendations, assist with risk reduction activities, and monitor action plans and KPI's.

Economic

The Property Loss Prevention auditing is done by external risk engineers. They assess systems and the process safety culture with particular focus on:

- mechanical integrity of physical plant and equipment;
- loss prevention skills and expertise in place internally or available externally;
- Asset Process Safety management system and framework in place;
- Loss prevention and safety culture of management, supervisory, operating and maintenance personnel.

□ Towards Highly Protected Risk (HPR) certification

The top standard adopted by the Solvay group is the Highly Protected Risk (HPR) level and practice. This certification, given by an external Risk Engineering Company, means that:

- All human element recommendations issued by the external risk engineers have been implemented;
- All recommendations associated with a Loss Expectancy scenario above €10 million have been implemented;
- All recommendations linked to the fire systems reliability have been implemented.

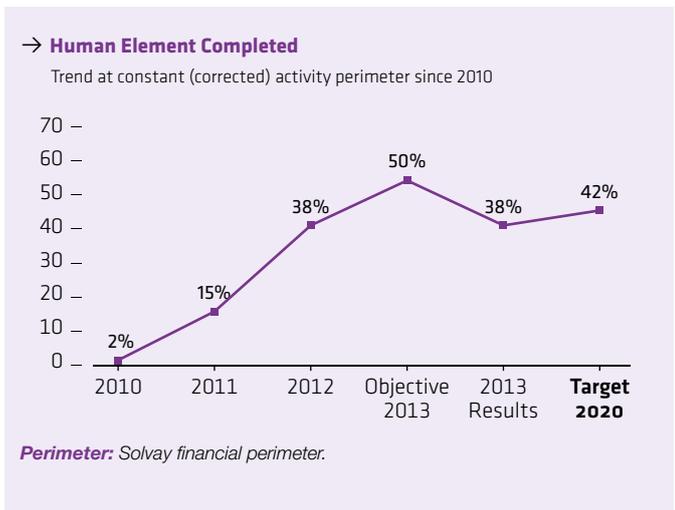
From an organization's point of view, HPR certification places the site at the center of this "Hearts and Minds" culture. It welcomes, encourages and rewards reporting "bad news"; it establishes a proactive attitude towards risk evaluation and risk reduction; it helps people to be prepared to expect the unexpected and it promotes constant anticipation of what could go wrong. Sites are prioritized according to their economical criticality from the GBU's and the Group perspectives.

□ Human element recommendations

The Property Loss Prevention program kicked off in mid-2009. In 2013, 278 human element recommendations made by external risk engineers were implemented.

With 163 new Human Element Recommendations added from new site visits and project reviews by external risk engineers, it was not possible to reach the 2013 objective of implementing 50% of the recommendations and we remain at 38%. Considering the number of new projects foreseen in our Business Growth Strategy, we have set a new objective of 42% of total recommendations to be completed for 2014.

The human element recommendations are recommendations for improving human procedures (operating procedures, safe work practices, asset integrity and reliability, contractor management, training, management of change, emergency) to reduce the likelihood of a loss.



□ Physical Protection recommendations

Recommendations related to the physical protection of manufacturing installations prescribe capital-intensive engineered systems to control and mitigate potential industrial losses.

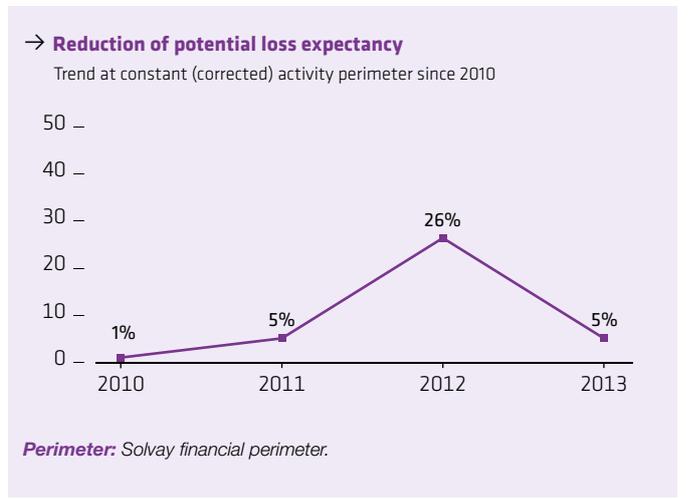
Of these recommendations, 201 were completed by the industrial sites concerned in 2013 resulting in a cumulative Loss Expectancy Reduction of €2 383 183 999. In addition, the external risk engineers assessing the current situation at plants have decided to delete 32 recommendations, with an attendant reduction of loss expectancy of €660 023 115. 9 500 m² of automatic sprinklers have been installed on site.

Compared to 2012, which saw major investment to protect critical businesses, assets and equipment, investment in additional protection returned in 2013 to a more standard level.

The external risk engineers issue Physical Protection recommendations whenever a risk scenario identifies the potential to reduce loss expectancy (assets and/or profit) by at least of €5 million. The annual objective on Physical Protections is flexible and aligned on the overall Group and GBU economic strategy for the year, that determines the level of criticality of the particular site and the consequent protection efforts.

All recommendations are recorded and followed-up in a common tool.

As of today, 82 Solvay plant managers, HSE managers, industrial family members, and Risk Managers) have availed of this service, resulting in more than 850 visits in 2013.



G4-EC2

Financial implications, risks and opportunities due to climate change

For more details, the reader is referred to Risk Management in the Annual Report pages 147-161 and our CDP reporting.

■ Environment provisions

Other environmental aspects than climate change have potential financial implications for the Group. In parallel to the management of risks and opportunities linked to climate change issues, Solvay manages environmental provisions with a long term vision.

→ Environment provisions

	2009	2010	2011	2012	2013
EUR Million	669	737	826	801	629

Perimeter: Solvay financial perimeter.

Legend: The provisions are reviewed on a quarterly basis in accordance with the IFRS norms.

The relative stability over time of the financial provisions for environmental risks is a reflection of the rigorous policy, the systematic risk management as regards health, safety and environment and the solid financial reporting processes. The largest constituent of these provisions is the environmental provisions.

The reduction in environmental provisions in 2013 is mainly a consequence of the classification of the European chlorovinyls activities as “assets held for sale” and of the evolution of financial items (discount & exchange rates). The decrease in provisions in 2012 mainly reflects the reclassification of the South American chlorovinyls activities as “assets held for sale”. The increase in provisions in 2011 was mostly due to the application of IFRS-3 “Business combinations” following the acquisition of Rhodia.

The financial exposure to health, safety and environmental risk is managed by insurance programs and financial provisions.

Environmental Contents

Environmental Management	48
Materials	50
Energy	51
Water	53
Biodiversity	55
Emissions	56
Effluents and waste	60
Soil management	65
Products and services	66
Transport	69
Supplier Environmental Assessment	70

Protection of the environment is for Solvay a key condition for doing business. It is part of its sustainable development policy and of its commitments to ICCA's Responsible Care® Global Charter, first signed in 1992, then resigned in 2007. Solvay thus strives for continuous improvement in environmental protection.

Regarding greenhouse gas emissions, two main objectives are targeted: first, to improve the energy efficiency of production processes so as to reduce CO₂ emissions, with realistic targets that are compatible with the specific energy requirements of a heavy industry, second, to reduce other greenhouse gas emissions as far as technically and economically feasible and in line with existing or expected regulations.

As regards other environmental emissions, special attention is given to deploying environmental management systems and further controlling emissions. At site level, recognized management systems form the reference framework for the concrete deployment of all environment-related activities.

As a major player in the chemical industry, Solvay also draws significant volumes of water from the natural environment and uses large quantities of non-renewable raw materials, predominantly fossil fuels. A dedicated program is under way for sites that can potentially find themselves in water stress situations.

Seven new improvement targets covering emissions, waste, water and energy consumption have been defined to further improve the Group's overall environmental performance between 2012 and 2020. For more details, the reader is referred to the page 3.

□ Policies and means

Four key action lines are followed:

1. Ensuring regulatory Compliance;
2. Controlling and reducing the impact of emissions of hazardous substances;
3. Preventing accidents with environmental consequences;
4. Managing water resources, raw materials and biodiversity in a sustainable way.

These action lines give concrete form to the Group's environmental policies: Environmental Management, Waste Management and Water Management.

Group standards, procedures, programs and tools support and frame sites' management for these 4 action lines, relying on risk analysis, monitoring of performance and compliance with regulations and permits, follow-up of the corresponding corrective actions, performance reviews, and improvement plans. Solvay also takes part in national responsible care programs in all countries where these programs exist and where Solvay has significant manufacturing activities.

□ Regulatory Compliance

All Solvay industrial sites are required to implement an effective process to check compliance with all applicable laws, regulations, permits and voluntary commitments, and to be able to document it. In particular, every site must undergo a full HSE regulatory compliance audit at least every 5 years (by auditors external to the site). Compliance with REACH is covered by a distinct process.

Environmental Management

Sites' environmental management systems (EMS) provide the frame for the deployment on every site of the 4 action lines: (1) ensuring regulatory compliance, (2) control and reduction of the impact of emissions of hazardous substances (3) prevention of accidents with environmental consequences, (4) sustainable management of water resources and raw materials.

Solvay sites rely on recognized EMSs (ISO 14001, EMAS, US Responsible Care Management System) or on the in-house system, the "Solvay Care Management System" (SCMS). For several years this in-house HSE management system has been deployed on a significant large part of sites. It will continue being deployed across the entire Group. Its requirements incorporate all requirements of the ISO 9001, ISO 14001 and OHSAS 18001 international standards and of the main international regulations. It was established by Rhodia which progressively deployed it over the past 10 years. This in-house system addresses all areas of HSE management and is integrated in the Solvay Way sustainability framework. It can be certified under other verification schemes (Occupational Health & Safety Assessment Series (OHSAS) 18001, Voluntary Protection Programs (VPP) or equivalent, ACC's Responsible Care), according to business and local needs.

All management systems in place in operational entities support continuous improvement via risk analysis, performance monitoring, follow-up of corrective actions, and review of performance including improvement plans. Following up compliance with permits and laws, along with documentation, are intrinsic parts of such systems. Process safety management also plays a key role in preventing accidents with environmental consequences.

Compliance with HSE regulations is a critical activity and all the more so for a chemical producer. For 2/3 of sites, the regulatory watch system relies on external services, preferably shared with other sites to reduce costs.

a. Environmental management systems

Our policy is:

- All Solvay industrial sites are to implement HSE Management Systems in line with Group standards.

Environmental management systems form the backbone of all the environmental programs of our sites in a comprehensive, systematic, planned and documented manner. They include the organizational structure, planning and resources for developing, implementing and maintaining policy for environmental protection.

→ Deployment of environmental management systems

Sites with management system	102 sites	77% of our sites
Sites with management system externally certified	80 sites	

Perimeter: Solvay group manufacturing perimeter under operational control (including joint ventures and discontinued operations).

Legend: Environmental management systems in line with Group requirements, either internal (SCMS) or external of ISO 14001 type or equivalent.

■ Deploying environmental management systems

77% of our manufacturing sites have now environmental management systems that are in line with Group requirements, with 78% of them externally certified.

A part of our sites manage environment aspects in the framework of ISO 14001 type or EMAS management systems. Another part of our sites rely on the in-house management system that will progressively be extended. These systems form the basis for our sites to seek or maintain external certification (78% of management systems are certified, especially for activities incurring significant risks of adverse environmental impact), under the various verification schemes.

In the US and in Argentina, Solvay sites' management systems are also based on the national Responsible Care® programs.

The Group HSE Management System is currently being updated. In 2014 a few sites will be audited by Corporate teams based on the redefined reference system. An external certification body will conduct audits to check the compatibility of the revised Solvay Care Management System system with the integrated ISO 9001, ISO 14001 and OHSAS 18001 certification in 6 sites. All sites will then have to progressively implement the updated system, building on their existing management system(s).

b. Compliance and environmental improvement programs

General policy:

- Sites must deploy Group environmental programs and standards, particularly for
 - (1) emission control and reduction;
 - (2) avoiding environmental infringements;
 - (3) compliance with environmental quality standards;
 - (4) assessing compliance and seeking alignment with the environmental requirements related to best available techniques;
 - (5) impact assessments programs;
 - (6) eco-toxicity assessments;
 - (7) appropriate and effective business-specific voluntary commitments.
- Regulatory watch and monitoring: "All Solvay industrial sites must implement an effective process to check compliance with all applicable laws, regulations, permits and voluntary commitments, and must be able to document it."
- Management review: "All Solvay sites must conduct at least an annual management review of their overall HSE performance and compliance."
- Audits: "All sites must undergo periodic audits, conducted by qualified auditors, on the deployment of the Group HSE management system as well as on HSE compliance assessments, in line with the Group audit policy and plan approved by the COMEX. All sites must cooperate fully and with collegiality with all prescribed audits."

Four levers for ensuring compliance at sites

- **HSE regulatory compliance audit:** This is the operational entity's responsibility, and is carried out by outside specialists. The objective is to detect any deviation.
- **Structured and documented HSE regulatory watch:** the site keeps up-to-date with any regulatory changes (new texts or new requirements within the operating permits)
- **Follow-up of deviations and associated action plans:** It is the task of the operational entity to collate all deviations and define corrective action plans.
- **Site Management Reviews:** the entity's management committee meets regularly (once or twice a year) to validate the corrective action plans for ensuring compliance as soon as possible. This plan is then presented to the relevant GBU, which allocates the necessary resources.

Monitoring regulatory compliance

In addition to self-assessments, the Group's policy requires every site to undergo a full audit of its HSE regulatory compliance by auditors external to the site at least every 5 years. At end-2013, 85% of sites had had an external compliance audit performed in the last 5 years.

Audits involve an exhaustive analysis of applicable requirements, and a check that they are properly implemented. This may take several weeks on a complex, high-risk site. For example, 6 000 individual requirements have to be evaluated for a high-threshold Seveso site in France such as Tavaux or Chalampé.

→ Sites with external audit of regulatory compliance < 5 years



Perimeter: Solvay group manufacturing perimeter under operational control (including joint ventures and discontinued operations).

Legend: HSE regulatory compliance audits by auditors external to the site.

Compliance embedded in sites' management systems

Compliance is also at the core of the management systems used within the Group (ISO 14001, EMAS, OHSAS 18001, RCMS). Within the frame of their particular management systems, sites carry out annual management reviews of compliance status. From those reviews environmental improvement programs are decided and deployed.

Improvement programs

→ Plans of environmental improvement

	% of sites
Plans for significant reductions of emissions within the 3 next years	75%
With dedicated waste action plan	89%

Perimeter: Solvay group manufacturing perimeter under operational control (including joint ventures and discontinued operations).

75% of sites are planning significant further reductions of environmental emissions in the coming years. In the frame of environmental management systems, Solvay sites undertake annual management reviews of compliance status and environmental performance. Improvement programs are decided and deployed, in particular in response to the Group's strategy to reduce its environmental risks and footprint.

Europe's Best Available Techniques requirements

The program to benchmark Solvay manufacturing plants to the environmental requirements of Best Available Techniques (BATs) and BREFs (*), started in 2011, is now completed, with more than 500 assessments carried out. Compliance with BATs will be further sought, taking into account, as prescribed, economic feasibility, assessment of the local situation and potential impacts. These in-depth assessments are a strong lever for further progressively aligning environmental performance to the best benchmarks for all similar manufacturing units.

(* Ref: Best Available Techniques Reference documents. According to Article 14(3) of the Industrial Emissions Directive, BAT shall be the reference for setting the permit conditions for installations covered by the Directive.

Specific programs for local nuisances

These programs are deployed site by site on a case by case basis, according to local conditions and manufacturing processes.

→ Deployment of local pollution prevention plans

Sites with dedicated program for dust control	79
Sites with dedicated program for noise control	97
Sites with dedicated program for odour control	50

Materials

G4-EN1

Materials used by weight or volume

■ Bio-sourced raw materials

With regard to biosourced raw materials, Solvay is promoting a responsible sourcing of bio-sourced raw materials, which represents around 400 000 tons or 10% of all raw materials. Although the volume of bio-sourced raw materials remains small as compared to classical raw materials, many projects relying on bio-sourced materials have been examined or have become an industrial reality: Solvay is striving to promote responsible sourcing.

Our policy is:

- To explore and deploy the technical value and long-term competitiveness potential of bio-sourced renewable raw materials or energy, carefully assessing their acceptability regarding biodiversity and ecosystem protection;
- Wherever relevant, to ensure that bio-sourced raw materials are supplied from sustainable, certified sources.

→ **Renewable raw materials used (2013)**

	2012	2013
Tons	381 300	407 200

Legend: Renewable materials used as raw materials in Solvay manufacturing processes.

□ Management of renewable raw materials

One of the 6 axes of Solvay's R&I is to "develop renewable chemistry, opening the way for technologies that promote the use of renewable raw materials: new bio-based compounds, recycling processes..." In 2013, bio-raw materials represented around 407 200 tons of intrants.

Solvay has been active for more than 15 years in exploratory studies and industrial projects based on bio-sourced raw materials or combustibles. Various projects have been implemented relying on a range of bio-sourced raw materials, including wood pulp, bio-ethanol, C12-C14 alcohols, guar split, lauryl alcohol, hydrogenated coconut oil, glycerin, coconut fatty acid, and sebacic acid.

The objective is to take benefit of new raw material bio-sourcing when economically, ecologically and socially viable. Such benefits may be:

- New chemical functionalities brought by the bio-sourced molecules;
- Alternative source for scarce / costly raw materials;
- Reduction, in the long run, of fossil fuel consumption and the related greenhouse gases impact of Solvay's activity (cradle-to-gate) due to raw material or energy sourcing.

With its Epicerol process based on natural glycerin, for example, Solvay currently runs one of the world's largest renewables activities in terms of volumes of bio-sourced chemicals produced.

Several industrial projects in the area of wood-based energy sourcing have also been closely investigated.

Solvay's policy is to promote certified suppliers of bio-sourced materials: key steps have been taken to tackle this requirement.

Main bio-sourced materials

The main bio-sourced materials used are:

- Vegetable oils (soybean, palm), by-products of which are used as raw materials in the manufacture of epichlorohydrin (via bio-sourced glycerin), a significantly cleaner path than traditional processes;
- Wood residues for the manufacture of cellulose acetate;
- Ethanol from straw and sugarcane bagasse to produce oxygenated solvents for paints and varnishes.

Striving for responsible bio-sourcing

Although bio-sourcing for producing chemicals in general remains extremely marginal as compared to the bio-fuel industry, and of course the wood and agro-food industry, Solvay is willing to assess its acceptability in terms of impact on biodiversity and ecosystem protection. Whenever possible, the Group sources bio-sourced raw materials from certified suppliers.

□ Best practices in responsible bio-sourcing

Glycerin derived from the biodiesel industry

The glycerin used in the Epicerol process comes from the oleochemical and biodiesel industries, that use mainly vegetable oils from rapeseed, palm and soybean. Solvay strives to work with suppliers who share its sustainability commitment.

- Rapeseed - of European origin, is covered by the European Directive on renewable energy which commits suppliers to sustainability criteria.
- Oil palm - of Southeast Asian origin, is supplied by members of the Round Table for Sustainable Palm Oil (RSPO). A part of the quantities supplied is certified to RSPO criteria: protection of biodiversity, soil, water, and working conditions (no child labor).
- Soybean oil - of Latin America origin: the supplier is committed to environmental specifications: excluding deforestation, child labor, or the irresponsible use of pesticides.

Solvay encourages the emergence of harmonized certification systems of biobased oils, in the context of the sustainability of biofuels (RED, Fair trade, RSB, RSPO, RTRS etc.). An internal working group will be established to develop an overall responsible procurement policy.

Wood pulp sourcing for cellulose production

We ensure contractually the adherence of our wood-pulp suppliers to international high environmental and social standards, starting from their wood sourcing up to the production of the dissolving wood pulp we buy from them. All of our suppliers and their wood contractors are certified to either FSC, PEFC or SFI standards or, in one case, will be certified shortly. This ensures that their sourcing and production are compliant with key principles: adherence to all applicable laws and

international treaties, the recognition and respect of indigenous people's and forest workers' rights, reduction of the environmental impact of logging activities, and maintenance of the ecological functions, the integrity of the forest and the promotion of restoration and conservation of natural forests.

Ethanol in Brazil for Coatis

All suppliers under contract by Solvay Coatis (which designs oxygenated solvents, phenol-based products and derivatives) are members of the UNICA Association that takes part in the Bonsucro (Better Sugar Cane Initiative) program. This is a certification in the Brazilian sugar cane market, encompassing several sustainability aspects. Contracted suppliers have or are obtaining all the listed certificates (FSSC 22000, OHSAS 18001, ISO 9001 and 14001). For the rest (spot purchases), best efforts are made to buy from companies with the same practices.

Energy

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

Ensuring long-term energy supply is also a permanent concern. Diversifying energy sources and developing alternatives to fossil fuels wherever sustainable in ecological, economic, industrial, and social terms is a strategic goal. This takes concrete form in heavy technical investments or in partnerships and contractual arrangements extending over long periods such as the Exeltium consortium.

A structured reporting system, externally verified, and the response to rating agencies such as the Carbon Disclosure Project or DJSI, help the Group to align its efforts on the materiality of its energy and climate challenges.

G4-EN2 Percentage of materials used that are recycled

For more details on product recycling, the reader is referred to page 67.

G4-EN3 Energy consumption within the organization

→ Energy consumption



	2009	2010	2011	2012	2013
Petajoules (Low heating value)(*)	142	160	227	222	168

Perimeter: Solvay historical financial perimeter.

Legend: This indicator reflects the primary energy consumption during a given year related to manufacturing activities of fully and proportionately consolidated companies for that year. No historical correction for change in activity perimeter. The increase between 2010 and 2011 is due to the acquisition of Rhodia and the decrease between 2012 and 2013 to the classification of the chlorovinyls activity in the discontinued assets for sale category.

The primary energy consumptions of the companies in the financial perimeter represents 66% of the total primary energy consumption of all companies in the operational perimeter.

(*) Absolute figures: no correction for changes in activity perimeter.

- Solvay's energy reporting is in line with the WBCSD "Guidelines for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain";
- For more details on the definition and scope of energy indicators, the reader is referred to the pages 18-19.

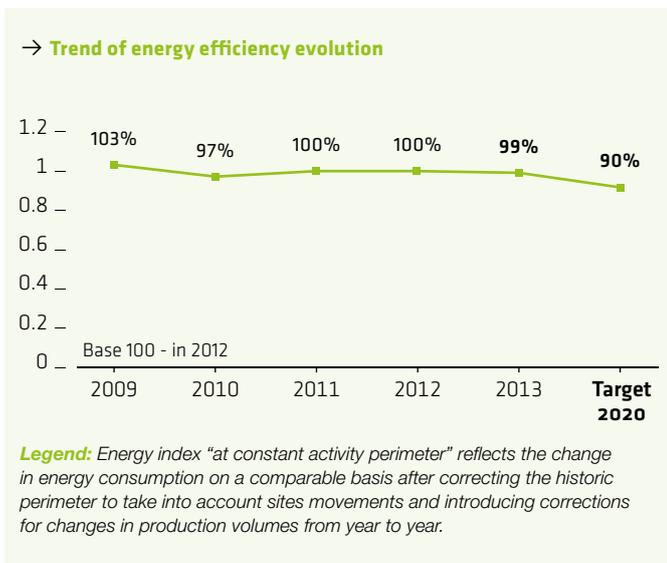
G4-EN5 Energy Intensity

Primary Energy of fuels (coal, gas, fuel oil ...) and of purchased steam and electricity.

Solvay's 2020 target (*):

➔ The Group has committed to reduce its energy consumption by 10% (1.3% per year on average).

^(*) Base 2012 at constant activity perimeter.



G4-EN6 Reduction of energy consumption

The Group has reduced its overall energy intensity by 4% since 2009. Key factors in this progress are the "Solwatt" project to improve the energy efficiency of manufacturing processes and the manufacturing excellence approach.

Three parallel approaches are followed:

- Improving the generation efficiency of secondary energies like steam and electricity by developing the use of high efficiency cogeneration plants. Even if cogeneration is already well deployed within the Group, new cogeneration projects are now being considered, in both Europe and the US;
- Solwatt, the internal pole of excellence in energy efficiency, aims at identifying and implementing energy savings in existing manufacturing units, via technology improvements and management behavior. This project will be extended to all concerned sites that will be evaluated by end 2015;
- New or remodeled plants are optimized for energy consumption and generation.

For example, in 2013, the operational excellence program was deployed in sodium carbonate manufacturing plants. The remodeling of the cogeneration unit in La Rochelle (France) was completed.

Other improvements are in progress, like the new gas engine at Oldbury (UK), or new cogeneration units at Houston and Thorofare (USA).

For the future, technological breakthroughs will improve the global energy efficiency of Solvay's operations:

- Following the mega hydrogen peroxide (HP) plants in Antwerp (BE) and in Map Ta Phut (TH), Solvay has begun constructing one of the world's most efficient HP plants in the Kingdom of Saudi Arabia.

■ Solvay Energy Services

Solvay Energy Services optimizes the energy purchases of the Solvay group, which amount to €0.9 billion per year, as well as helping the Business Units and production sites to manage their energy requirements and CO₂ emissions.

Solvay Energy Services has been managing energy purchases for industrial third parties in France for several years. These activities have been extended to other countries.

For example in Brazil, Solvay Energy Services has developed and operates a biomass fired cogeneration unit using sugar cane bagasse.

Solvay 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 both thermal energy and electricity to be produced with gas turbines) have been undertaken. In 2013, Solvay Energy Services installed three gas-fired high-efficiency cogeneration plants, in Tavaux (F), in Torrelavega (SP) and in Belle-Etoile (FR).

Solvay Energy Services is also a founding member of consortia of electricity intensive industries such as Exeltium, aimed at securing long-term supply to Solvay plants at competitive conditions.

Water

G4-EN8

Total water withdrawal by source

■ Water withdrawal

Our policy is:

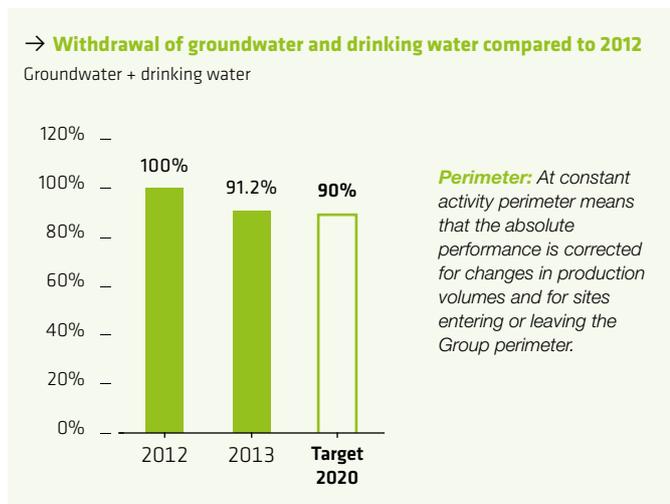
- To protect the quality of the water resource and to limit the need of fresh water withdrawals linked to Solvay industrial activities;
- To reduce fresh water withdrawals and especially where there is a constraint to water access for Solvay or for other needs (domestic, agricultural, industrial or environmental).

Solvay's 2020 Target (*)

- To reduce further by 10% (-1.3% per year) the withdrawal of groundwater and drinking water.
- To implement a Sustainable Water Management at 100% of our sites under water stress.

The withdrawal of groundwater and of drinking water from public networks was reduced by 8.8%. The 2020 objective has almost already been reached.

(*) Base 2012 at constant activity perimeter.



□ Water resource management

Sustainable water management involves a wide variety of technical approaches, specific to each plant's situation. Key management elements to ensure a Sustainable Water Management are integrated in the "Solvay Way" with the aim for sites in water stressed environments to implement the BAT in water consumption.

The impact of withdrawals by Solvay on water availability is generally alleviated by the return of a large part of the abstracted water to the same environmental compartment (surface to surface), particularly cooling waters.

Action plans to reduce water withdrawals will focus in priority on sites using drinking water and/or groundwater and on sites located in regions affected by water stress. Plants located in regions where the freshwater yearly renewal will drop below 1000 m³/capita.year are identified as sites under potential hydric stress.

This methodology encompasses the following main steps for each site:

- Robust water balance reflecting the quality and quantities of all discharges, and impact assessments of withdrawals vs the current or future availability of water taking into account third parties' needs;
- Definition of projects guided by the 3R approach (reduce / reuse / recycle). The focus is on reducing the net use of freshwater, especially groundwater, by promoting techniques to recycle used water, also from external sources, by using lower quality water, such as sea water, and by adequately treating the final waste water flows;
- Implementation of options presenting the best efficiency / cost ratio in line with the site strategy to reduce its vulnerability to water availability.

□ Group program for sites under potential hydric stress

The new Group program on sustainable water management, which started in 2012, consists of three phases:

- Preliminary screening of sites under hydric stress using macroscopic screening tools such as the "Global Water Tool" (World Business Council for Sustainable Development) and "Aquaduct" (World Resource Institute). Predictions from these tools are based on expected demographic, economic and technological evolutions as well as on rainfall predictions. Using these tools, combined with previous internal assessments, we have identified 33 sites from a total of 134 production sites (25%) that are susceptible to face hydric stress by 2025 (together they are responsible for around 12% of the freshwater intake of the Group), and 41 sites (31%) by 2050. Most of the "hot spots" are located in regions at latitudes between 20° and 40°;
- Detailed assessment of the local situation at the "hot spot" sites in order to further qualify and quantify the water risk (physical risk linked to water availability or water quality, regulatory risk or reputational risk);
- Action plans in critical sites in order to address the identified risks and safeguard operations while meeting the water needs for the civil population and agriculture.

■ Group performance (without corrections for changes in activity perimeter)

□ Water intake

	2011	2012	2013
Groundwater + drinking water (1000m ³)	255 123	222 698	210 895

Perimeter: Solvay financial perimeter.

Environment

In 2013, Solvay withdrew less groundwater + drinking water (-5.3%) thanks to significant saving projects implemented in Chalampé (France), Rosignano (Italy) which is located in an hydric stress area and Warrington (UK). Drinking water accounts for only 8% of this indicator value in 2013.



	2011	2012	2013
Intake of surface water (1000m ³)	562 362	312 623	315 853
Intake of underground water (1000m ³)	229 092	205 523	193 835
Intake of estuary and sea water (1000m ³)	127 282	84 039	89 617
Total water intake (1000m³)	949 558	623 807	623 075

Perimeter: Solvay financial perimeter.

In 2013, surface water withdrawal increased only slightly (+1.0%), although production output increased by 2.4%. 2013 figures also include water intake for the new power plant in Brotas (Brazil). The use of sea water as cooling water increased by 6.6%. The main user (Rosignano, Italy) used more water in comparison to 2012 because of a higher average sea water temperature.

Solvay takes part in “E4Water” (*)

Under the umbrella of the European Union’s (FP7) program, Solvay is part of “demonstration projects” within Europe’s “E4Water” initiative. The objective is to bring key water saving approaches up to the industrial scale level. Solvay joins here companies like Procter and Gamble, Dow, and Total, with pilots under way at Martorell (Spain) and Lillo (Belgium).

(*) E4water: Economically and Ecologically Efficient water management in the European chemical industry

■ Key programs for water saving

□ SolVin (Martorell site, Spain), recycles effluents from PVC manufacturing

A project is under way to add post-treatments to recover used water to produce demineralized water, and achieve closed loops in the same manufacturing units. As much as 100m³/h (900 000 m³/y) of additional recycling can be anticipated. This will add to the current internal recycling loops already in place for five years (used water from PVC batches recycled in other lower grade PVC batches, representing around 130 000m³/year with recycling rates of 60%).

The demonstration could then be extended to other Solvay PVC plants. The project started mid-2012 and will last for four years.

□ Panoli site (India) brings significant water

An industrial scheme has been set up to reuse up to 80% of waste water from the plant, more particularly as cooling water makeup and boiler feed water. The site has succeeded in doubling its PEEK production capacity with a stable water consumption. This has necessitated an upgrade of the biological treatment unit, several reverse osmosis units, a multiple effect evaporator, and a hardness abatement unit. The quality of the treated water enables multi-reuse. 35% of water is now taken from contaminated groundwater, thanks to a treatment and recycling operation, instead of good quality surface water.

□ Monterrey, a Mexican site in a very arid area

The site is located in a very arid zone. For this reason, a municipal waste water treatment plant water recycling project has been promoted and completed with the support of Solvay and other local companies. 93.5% of the site’s industrial water requirement (109 000 m³/yr) is now supplied via this recycling project, instead of using groundwater. Nevertheless, water issues must continue to be managed very efficiently in this area.

□ Solvic, in Lillo (Belgium) to demonstrate new water savings by closing loops between partners

The project involves Solvic’s industrial neighbors in the area of the Port of Antwerp (Belgium). After inventorizing all potentially recyclable water flows, partners have selected the water streams that are the most suitable for recycling, and are installing the necessary additional treatment modules. This will make water “circular economy” a reality in this area, making the best use of residual water. The issue is to reduce the intake of potable water. Lillo wants to reduce the intake of potable/demineralized water by 30% as a first step (around 300 000m³). Pilots have been constructed and first tests have started.

□ Recycling scheme in Tuscany (Italy)

Since 2006 in Tuscany, the Aretusa (Azienda Servizi Ambientali, Termomeccanica) consortium enables wastewater from the local domestic municipal treatment plant to be recycled as process water in Solvay installations, after adequate retreatment. This leads to very high, recurrent savings (about 4 million m³/y) in water abstraction from groundwater in the region of Bassa Val di Cecina. Even so, in summer 2012, the plant was confronted with significant water shortages.

□ Water savings in Vernon (USA)

The region is hydraulically stressed and the plant uses large amounts of water supplied by the city. Wash water recycling was first investigated in 2010, as it is the product washing step that uses most water. Redefining washing conditions made it possible to minimize water use while still meeting product specifications. Recycling was successfully implemented in 2012. In 2013, based on the product mix processed in the main plant, 40 000 m³ water was saved, representing a 20% reduction of water use.

□ Water from waste water treatment in Australia

To reduce the use of potable freshwater in the dry region of Banksmeadow, Sydney (Australia), the Solvay plant has progressively substituted this scarce supply with water from the nearby Orica Treatment Plant which treats contaminated groundwater from the Botany aquifer. This has more than halved our use of city water. This has called for more sophisticated control of treatment chemical levels within our cooling water circuit, in turn permitting increased utilization of water from Orica, mainly in our cooling circuits and to produce demineralized water.

Biodiversity

Regarding biodiversity, Solvay is willing to limit the potential impacts of operations' discharges into water, air and soil, in particular those with an acidification and eutrophication potential.

Solvay also impacts the natural ecosystems via its own greenhouse gas emissions, but also those avoided thanks to its products along the value chains, and via water abstraction from scarce areas that can also put pressure on ecosystems balance. Water management is a key element of environmental management. In addition, the Solvay owns and manages large areas, in particular mines, quarries, and storage areas containing large volumes of non-dangerous residues, for which there is a long history of rehabilitation.

G4-EN12 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas

■ Operational factors related to biodiversity:

Our policy is:

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

- Bio-sourced raw materials - responsible sourcing: see pages 50-51;
- Water resource management: see page 53;
- Greenhouse gas emissions: see pages 56-58;
- Control of emissions into environment: see pages 58-60.

G4-EN13 Habitats protected or restored

■ Biodiversity and natural areas

→ **Management of natural areas**

Sites with significant natural areas	38 sites
Hectares	18 630 ha
Areas managed as a green area: rehabilitation, plantation, ...	30 sites
Hectares managed as green natural area	3 951 ha
Trees replanted (Total)	65 000 trees

Perimeter: Solvay group manufacturing perimeter under operational control (including joint ventures and discontinued operations).

□ Biodiversity and management of natural areas

Multiannual, often large-scale rehabilitation of natural areas is ongoing in 30 Solvay sites. In particular, the biological rehabilitation of old dikes and quarries on Solvay's lands has been under way for decades. 3 900 hectares have been actively replanted so far, often with trees. Some of these rehabilitated areas are even now recognized as nature reserves to be protected.

Solvay owns and maintains over 18 000 hectares of natural land around its sites, where biodiversity is most often protected from housing or roads and plays its role as a natural buffer. The concerned sites manage natural areas so as to contribute to biodiversity protection. Solvay is committed to developing collaboration with NGOs and third parties around its manufacturing operations and fosters synergies with third parties, for example allowing farmers or others to use its lands. A range of sites are working towards the recognition of rehabilitated areas as nature reserves.

In 2013, the celebration of the 20th anniversary of the Santa Luce Lake natural oasis (a large birds sanctuary near the Solvay plant at Rosignano in Tuscany) demonstrated again the success of this already longstanding project to protect and restore biodiversity between Solvay, LIPU³ and the local authorities.

Acting with government agency on biodiversity at Tavaux (France)

The replanting of settling ponds is under way. Other replanting programs are ongoing with the firm Geophyte. The Prolipyt project has been selected by the French Environmental Agency under the national "ecoindustrie" program. A study of the fauna and flora of the nearby Aillon pond, which the plant effluent passes through, has been carried out by the University of Franche Comté. Two steps are necessary to green the first 10 000 m²: adding an agronomically suitable soil, and sowing with a mixture of specifically adapted plant species. After this first phase, the full project, representing 60 000m², will be deployed.

³ The Italian Society for the Protection of Birds

Emissions

Controlling the environmental impact of Solvay operations is a constant endeavor, in line with the Group's environmental management policy. Globally, emissions to air and water have been dramatically reduced during the last twenty years.

Improved environmental performance overall results from:

- Developing management systems at each site with a focus on permit compliance and emission reductions;
- Achieving the past eco-efficiency improvement targets defined by the Group bringing significant overall impacts reduction: Progress in the past 8 years has gone beyond the pre-defined targets: between 2006 and 2012 with -58% for emissions in terms

of ozone depletion potential impact, -42% for acidification potential impact, -33% for eutrophication potential impact and -23% for Photochemical oxidant formation (POF);

- Targeting further reduction for the medium term (2012-2020): by 25% for air emissions with an acidification potential (in SO₂ equivalent), by 10% for air emissions with a photochemical oxidant formation (in NMVOC equivalent), and by 20% for water emissions with an eutrophication potential (in PO₄ equivalent);
- Focused actions on the control of Substances of Very High Concern wherever necessary;
- Seeking high performance in new and acquired activities.

G4-EN15 Direct greenhouse gas emissions (Scope 1)

→ Greenhouse gas emissions



		2009	2010	2011	2012	2013
Direct & indirect CO ₂ emissions (scopes 1 & 2)	MtCO ₂	8.3	9.5	12.8	12.4	10.7
Other greenhouse gases (Kyoto Protocol) emissions (scope 1)	MtCO ₂ eq	2.9	2.3	2.3	2.5	2.8
Total greenhouse gases (Kyoto Protocol) emissions	MtCO ₂ eq	11.1	11.9	15.1	14.9	13.5
Other greenhouse gases (non-Kyoto Protocol) emission (scope 1)	MtCO ₂ eq	0.2	0.2	0.2	0.1	0.1

Perimeter: Solvay historical financial perimeter.

Legend: This indicator reflects the greenhouse gas emission during a given year related to manufacturing activities of fully and proportionately consolidated companies for that year. No historical correction for change in activity perimeter. The increase between 2010 and 2011 is due to the acquisition of Rhodia and the decrease between 2012 and 2013 to the classification of the chlorovinyls activity in the category discontinued assets for sale.

The greenhouse gas emission of the companies in the financial perimeter represents 73% of the total greenhouse gas emission of all companies in the operational perimeter.

Solvay's energy reporting is in line with the WBCSD "Guidelines for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain".

For more details on the definition and scope of energy indicators, the reader is referred to the pages 18-19.

G4-EN16 Energy indirect greenhouse gas emissions (Scope 2)

See chart above.

G4-EN17 Other indirect greenhouse gas (GHG) emissions (Scope 3)

In 2013, emissions due to the transport of Solvay products (downstream transportation and distribution) represents: 1 071 150 tons of CO₂. Other elements of scope 3 are not yet reported.

Solvay has taken part, via the World Business Council for Sustainable Development (WBCSD), in world-scale streamlining of the chemical industry's sustainability accounting: The new WBCSD guide gives direction to companies on a common approach for accounting and reporting on challenges such as joint ventures, the resale of energy, identifying relevant value chain (scope 3) activities such as combined heat and power installations, and swapping arrangements. It also provides a consistent framework for reporting, which allows for more transparency and consistency on corporate-level climate impacts across companies. By having a common, sector-wide approach, companies can now compete on sustainability performance, rather than on methodologies.

As members of the WBCSD, Solvay participated with nine other world large chemical companies on the redaction of guidance for accounting & reporting corporate GHG emissions in the chemical sector value chain. This guidance published in February 2013, provides a consistent framework for reporting, which allows for more transparency and consistency on corporate climate impacts across companies.

Solvay participated also to the preparation of two other WBCSD guidelines:

- Guideline on accounting for and reporting avoided GHG emissions.
- Guideline on life cycle metrics for LCA⁵ published by the chemical industry.

■ Addressing minor greenhouse gas emissions: looking for energy savings beyond manufacturing processes

In the Belle Etoile facilities in Saint Fons and Feyzin (France) for example, 12 000 square meters of photovoltaic panels have been fitted to the roof. This project, one of the largest roof solar panel projects in France, is a partnership with companies involved in solar power production.

The facility produces 2 million kilowatt-hours per year, corresponding to the annual electricity consumption of a town of 2 000 inhabitants. Ultimately, the electricity produced will avoid releasing 1 000 tons of CO₂ each year.

For the car fleet, the objective defined in 2008 to reduce by at least 30% the CO₂ emissions related to the car fleet has been largely reached, via a significant reduction in the European & American fleets, in part from the sale of the Pharma sector. This achievement results from Solvay's car policy and from much improved vehicle efficiency leading to fuel economy, and lower emissions.

The reduction obtained in European countries (especially in BE, FR, IT, PT, ES, and DE) is mainly due to the change in the fleet structure, with a higher proportion of status cars with lower annual mileage.

Eco Fleet Management

The Eco Fleet Management concept aims at better selecting, managing, and monitoring the fleet along both its ecological and economic dimensions.

The "Drive low CO₂, drive less, drive better" campaign includes:

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

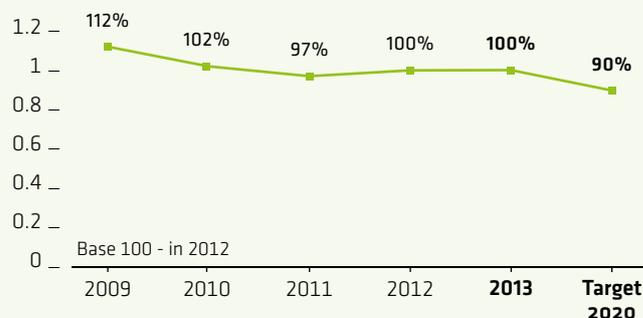
G4-EN18 Greenhouse gas emissions intensity

Solvay's 2020 target^(*):

- The Group has committed to reduce its Greenhouse gas emissions by 10% (1.3% per year on average).

(*) Base 2012 at constant activity perimeter.

→ Trend of greenhouse gas intensity index



Legend: Greenhouse gas intensity index "at constant activity perimeter" reflects the change in greenhouse gas emissions on a comparable basis after correcting the historic perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.

⁵ LCA = Life Cycle Assessment

G4-EN19 Reduction of greenhouse gas emissions

The Group has reduced its greenhouse gases emissions by 12% since 2009, at constant activity perimeter.

This was mainly achieved thanks to the reduction of greenhouse gas emissions other than CO₂. Decreases were also made possible by purchases of lower carbon electricity, use of recycled wastes as fuel in Bernburg (DE) and reduction of emissions of fluorinated gases in Bad Wimpfen (DE), Frankfurt (DE) and Onsan (KR). Projects contributing to improved energy efficiency of manufacturing processes also significantly contributed to progress in the past 5 years.

□ Key achievements

In the trona mine at Green River (USA), partial recovery of the methane emitted during extraction of the trona, and its combustion, avoiding emissions equivalent to 100 000 tons CO₂ per year since 2011. Since 2012 the heat from the combustion of the recovered methane has been recovered in the manufacturing process, bringing additional energy and CO₂ savings. However, recent extension of the mining area has also produced additional methane emissions.

- At Bernburg (DE), reuse of regional recyclable waste to produce energy since end 2010, avoiding 350 000 tons of CO₂ emissions/year.
- In France, supply of nuclear electricity via Exeltium.

G4-EN20 Emissions of ozone-depleting substances (ODS)

→ Emissions without corrections for changes in activity perimeter



	2011	2012	2013
Ozone Depletion - ODP (teq CFC-11)	22.5	18.3	17.6

Perimeter: Solvay financial perimeter.

Legend: Ozone Depletion: impact indicator quantifying the potential destruction of stratospheric ozone due to the emission of ozone depleting substances (mainly refrigerants from the HCFC et HFC families).

Solvay emitted less substances contributing to ozone depletion in 2013 (-3.6% expressed as teq CFC-11, as compared to 2012) despite the overall increase in production output by 2.4%. The results are due to the program to eliminate the R22 refrigerant utilized in refrigeration equipment and to the decrease in emissions of methylchloride on the Zhangjiagang Feixiang site (China).

G4-EN21 NO_x, SO_x, and other significant air emissions

■ Air emissions

Acidifying gases, photochemical oxidant formation (POF), non-methanic volatile organic compounds, ozone depletion SO_x, NO_x, dust.

Our policy is:

- To protect the environment, including by reducing emissions, and to pursue the goal of doing no harm to people or the planet.

Solvay's 2020 target (*)

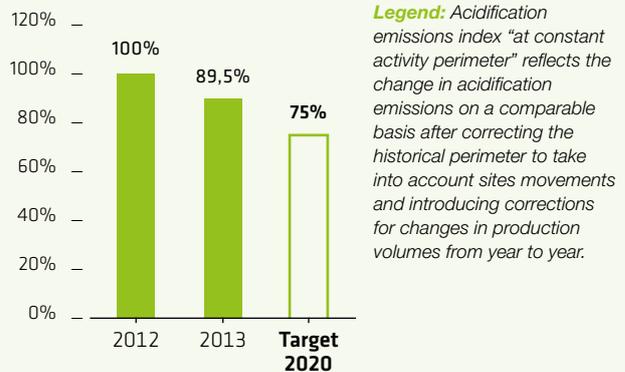
- To reduce by a further 25% (-3.6% per year) the air emissions of substances with an acidification potential (in SO₂ equivalent).
- To reduce by a further 10% (-1.3% per year) the air emissions of substances with a photochemical oxidant formation (in NMVOC equivalent).

(*) Base 2012 at constant activity perimeter.

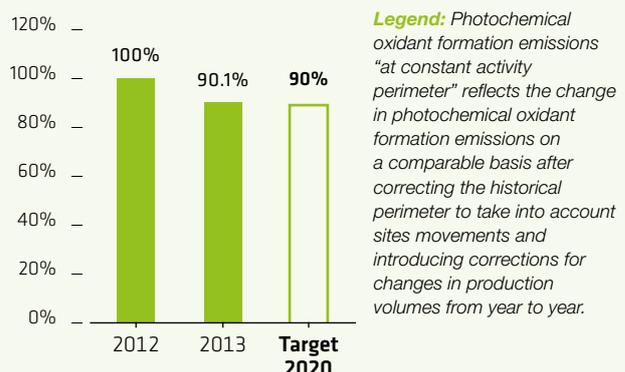
The release to air of substances with an acidification potential was reduced by 10.5% in 2013. After one year, the Group has already achieved 40% of its commitment.

The release to air of POF substances capable to generate ground-level ozone and produce smog has been reduced by 10% in 2013. After one year, the Group has already reached the defined target.

→ Acidification emissions compared to 2012



→ Photochemical oxidant formation (POF) emissions



■ **Group performance (without corrections for changes in activity perimeter)**

→ **Acidification**



	2011	2012	2013
Acidification (teq SO ₂)	27 074	24 409	23 420

Perimeter: Solvay financial perimeter.

Legend: Acidification: consequence of acids (mainly combustion gases such as NO_x and SO_x) emitted to the atmosphere and subsequently deposited (through acid rain, for instance) in surface waters and soils. The acidification indicator published quantifies the potential for terrestrial acidification on forests at the European scale (ReCiPe database). Other effects such as acidification of lakes or damage to buildings are not integrated into this indicator.

The decrease of the acidification indicator in 2013 (-4.1% expressed as teq SO₂, as compared to 2012) is due to the combined effect of variations in emissions of NO_x and SO_x, (see below) and to substantial reductions in the ammonia (NH₃) releases to air at the sites of Zhangjiagang Feixiang (China) and Rosignano (Italy).

→ **Photochemical oxidant formation (POF) emissions**



	2011	2012	2013
Photochemical oxidant formation (POF) (teq NMVOC)	19 624	16 487	16 332

Perimeter: Solvay financial perimeter.

Legend: Photochemical oxidant formation (POF) emissions: Radiation from the sun and the presence of nitrogen oxides and hydrocarbons in the lower layers of the atmosphere (troposphere) can lead to the formation of aggressive reaction products, one of which is ozone. Ozone leads to the formation of summer smog, damages vegetation and is toxic for humans. The POF potential of a substance, expressed as teq NMVOC, is its relative ability to contribute to this effect.

Emissions of POF substances (with a potential to produce ground-level ozone and smog: nitrogen oxides, carbon monoxide, sulfur oxides and volatile organics) were slightly reduced in 2013 (-0.9% expressed in teq NMVOC, as compared to 2012) despite an overall increase in production output of 2.4%.

→ **Non Methanic Volatile Organic Compounds**



	2011	2012	2013
NMVOC (tons) defined according to European Directive 1999/13/EC	9 019	7 917	7 565

Perimeter: Solvay financial perimeter.

Legend: Non methanic volatile organic compounds: compounds taken into account are those for which the normal boiling point is inferior or equal to 250°C. This definition is based on the European Solvent Directive.

NMVOC (Non-Methanic Volatile Organic Compounds) decreased by 4.4% between 2012 and 2013. The most contributing sites to this improvement are Green River's (USA), Zhanjiagang Feixiang (China) and Santo André - Rhodia (Brazil).

→ **Sulfur oxides (SO_x) emissions**



	2011	2012	2013
Sulfur oxides - SO _x (tons SO ₂)	13 043	10 356	10 298

Perimeter: Solvay financial perimeter.

Legend: Sulfur oxides (expressed as tons SO₂): acidifying gases mainly resulting from the combustion of sulfur containing combustibles (heavy oils, coal). The sulfur content of natural gas can be neglected.

Emissions of sulfur oxides (SO_x) remained stable in 2013. Here significant progress at Baton Rouge (US) and Dombasle (France) with the installation of new abatement equipment were offset by the temporary utilization of coal or lower grade coal in the boilers of Tavaux (France) and Torrelavega (Spain) and by the overall increase in production output (+2.4%).

Environment

→ Nitrogen oxides (NO_x)



	2011	2012	2013
Nitrogen oxides - NO _x (tons NO ₂)	9 169	8 717	8 988

Perimeter: Solvay financial perimeter.

Legend: Nitrogen oxides (expressed as tons NO₂): acidifying gases resulting from combustion processes. Thermal NO_x (generated from the nitrogen contained in the air used for a combustion process) is generally the biggest contribution. Additional NO_x can be formed from combustibles containing nitrogen compounds, such as coal.

Emissions of nitrogen oxides (NO_x) slightly increased in 2013 (+3% as compared to 2012), mainly due to the start-up of the Brotas (BR) power plant and the utilization of lower quality coal in Torrelavega (ES) but also to the overall increase in production output (+2,4%).

→ Dust emissions



	2011	2012	2013
Solid particulates (tons)	1 613	1 271	1 505

Perimeter: Solvay financial perimeter.

Legend: Dust: particulate materials in gaseous effluents streams.

Dust emissions increased by 18% compared to 2012, mainly due to the first year of reporting of our new power plant at Brotas (Brazil), using sugar cane residues as fuel. On the other hand, Silica and Eco Service businesses continued to record significant progress in reducing their channeled and diffuse emissions. At constant activity perimeter, emissions were reduced by 9.6%.

An exemplary assessment in Rheinberg (Germany) for an SVHC

Following the permit request by Rheinberg in 2006 for a new waste treatment plant, concern about emissions of vinyl chloride was expressed. In 2008 a working group was initiated (Rheinberg city, 3 NGOs (BISS, Frauen nach Krebs, Ärzte- und Apothekerinitiative Niederrhein), and Öko-Institut Darmstadt, Solvay). An independent laboratory (Müller BBM) was engaged to develop a new method to measure very low quantities of <1µg/m³. After months of validation, the method was identified and agreed. In 2011, during 6 months, a measurement container took samples and analyzed them in the nearby localities of Ossenbergl and Millingen, generating more than 10 000 measurements. Dispersion modeling and the measurements made it possible to build a highly realistic overview of the full impact around the Rheinberg site. This overview with third parties demonstrated no concern. Local NGOs praised Solvay for its good and brave engagement.

Effluents and waste

G4-EN22

Total water discharge by quality and by destination

Solvay reports on emissions to the environment in terms of quantities of pollutants emitted, not on water discharge by quality and destination. Indeed, the quality of water restituted to the environment is defined according to individual permits: There is no unified definition of water quality, especially of rejected water, which is usually defined on a case by case basis in relation to the nature and characteristics of the streams.

■ Water emissions

Eutrophication, nitrogen, phosphorus, Chemical Oxygen Demand (COD), heavy metals, adsorbable organic halogens.

Our policy is:

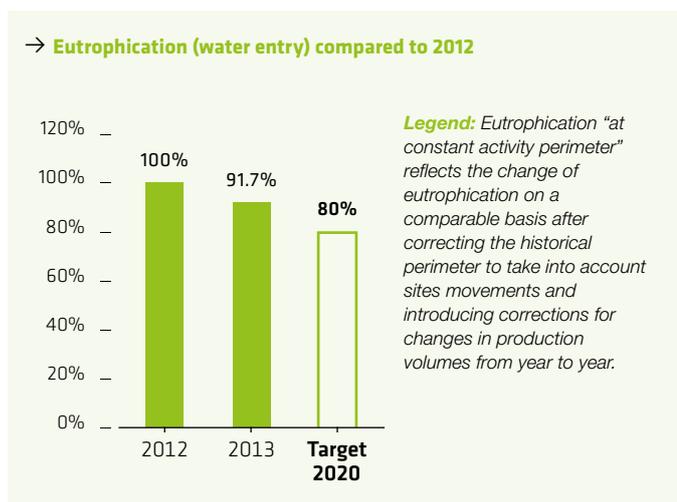
- To protect the environment, including by reducing emissions and to pursue the goal of doing no harm to people or the planet.

Solvay's 2020 target (*)

➔ To reduce by a further 20% (-2.8% per year) the water emissions of substances with an eutrophication potential (in PO₄ equivalent).

The release to water of substances capable of inducing eutrophication potential was reduced by 8.3%. The progress to target is already 42%.

(*) Base 2012 at constant activity perimeter.



Solvay runs 132 manufacturing sites in the world (117 sites in the financial perimeter) which use water and reject aqueous effluents that have the potential to impact the environment. Significant improvements were achieved in 2013: Even without correction for changes in activity perimeter, nitrogen discharges into surface water were -15%, releases of AOX compounds -7.8%, the eutrophication indicator -11%. This recent progress comes on top of very substantial progress achieved in the past, with, between 2006 and 2012: -42% for acidification, -33% for eutrophication and -20% for Chemical Oxygen Demand (COD). Adsorbable Organic Halogens (AOX) emissions have also been reduced by more than 80% over the past 7 years.

In order to verify the absence of impairment of aquatic biodiversity, Solvay has developed an impact assessment method based on a biotic index and an overall effluent toxicity approach.

The biotic index has already been in use at site level for several years and will be extended to more sites, helping check that water effluents do not influence the local water biological life.

For the next 2 years, special focus will be placed on controlling the impact of emissions of hazardous substances into the natural environment. Solvay will reinforce the inventory by sites of all substances of very high concern (SVHC) in the framework of the Group overall policy on such substances. The first step will be to further investigate alternatives at an affordable cost. A list of these substances is currently being drawn up by the SVHC Advisory Team. (For more details on Substance of Very High Concern, the reader is referred to pages 107-108). Dedicated work will very probably be necessary to assess salt effluents, especially in Asia.

■ Group performance (without corrections for changes in activity perimeter)

➔ **Chemical Oxygen Demand - COD emissions**



	2011	2012	2013
Chemical Oxygen Demand - COD (tons O ₂)	11 621	9 016	9 379

Perimeter: Solvay financial perimeter.

Legend: Chemical Oxygen Demand (COD): sum of substances (mostly organic but eventually also some inorganic species) which can be chemically oxidized into carbon dioxide. The COD value of an effluent is expressed in mg/L O₂. COD contributes to eutrophication.

Emissions of reducing substances (Chemical Oxygen Demand, COD) slightly increased in 2013 (+4% as compared to 2012), as the overall production output increased (+2.4%). The Rosignano soda ash plant (Italy) significantly contributed to this trend with an increased use of flocculation agents.

➔ **Nitrogen emissions to water**



	2011	2012	2013
Nitrogen (tons)	5 880	5 464	4 646

Perimeter: Solvay financial perimeter.

A 15% improvement in nitrogen releases to water was achieved in 2013, due to the start-up of two significant projects: the new ammonia distillation column in Alexandria (Egypt) and debottlenecking of the ammonium nitrate recovery plant at La Rochelle (France).

➔ **Phosphorus emissions to water**



	2011	2012	2013
Phosphorus (tons)	280	214	212

Perimeter: Solvay financial perimeter.

Solvay discharged stable amounts of phosphorus into water (-0.8% in 2013 as compared to 2012), as contributing sites had a stable production rate and did not implement any significant reduction project in that field.

Environment

→ Heavy metals emissions (E-PRTR list)



	2011	2012	2013
Total heavy metals to water - E-PRTR list (tons)	78.2	79.5	75.8

Perimeter: Solvay financial perimeter.

Legend: Heavy metals: E-PRTR list of heavy metals: As, Cd, Cr, Cu, Hg, Ni, Pb, Zn.

A decrease (-4.7% in 2013 as compared to 2012) of heavy metal in effluents to water has taken place. With soda ash plants being the main contributors to the emissions of heavy metals, the observed decrease can most probably be explained by normal variations in raw material quality (limestone, coal).

→ Adsorbable Organic Halogens (AOX) emissions

	2011	2012	2013
Adsorbable Halogenated Organics (tons)	49.8	34.8	32.1

Perimeter: Solvay financial perimeter.

Legend: Adsorbable Halogenated Organics (AOX): Halogenated organic substances adsorbable onto active carbon (X= Cl, Br...).

Aqueous releases of compounds belonging to the AOX category decreased by 7.8% in 2013 as compared to 2012. Part of this reduction comes from the Roussillon site (France) and is due to the decreased production volume of the Oxadiazon unit.

→ Eutrophication (water entry)



	2011	2012	2013
Eutrophication water entry (teq PO ₄)	3 582	3 148	2 807

Perimeter: Solvay financial perimeter.

Legend: Eutrophication (water entry): Environmental impact indicator quantifying the eutrophication in freshwater and marine water systems due to the release to water of COD, nitrogen- and phosphorus compounds.

The eutrophication indicator (water entry) reduced by 11% in 2013 as compared to 2012. The eutrophication indicator (expressed as teq PO₄) agglomerates the eutrophication impact of aquatic releases of nitrogen, phosphorous and reducing substances (COD).

Exploring new areas: “Moving bed bioreactors”

Moving Bed BioReactors (MBBR) is a water treatment technology that has been applied for many years now. It consists in developing a biomass biofilm on a carrier which is kept moving in the bioreactor and retained in place by a grid, resulting among other things in an increased biomass concentration. In 2013, Solvay successfully assessed the efficiency of this technology in the treatment of 2 kinds of effluents typical of the manufacturing portfolio: continuous on-site tests were carried out at Jemeppe (Belgium) in H₂O₂ manufacturing, and at Melle (France), where Aroma Performance products are manufactured. Both tests delivered good results for removing slowly biodegradable compounds or micro-pollutants and/or upgrading existing waste water treatment plants. This opens the way to further assessments at other sites.

G4-EN23 Total weight of waste by type and disposal method

The Group makes every effort to reduce industrial waste and in particular hazardous industrial waste, with as a policy to reduce them to a minimum with a target of -10% landfilled by 2020 for hazardous waste, and a maximum of material or energy recovery. For waste streams handled by third parties, Solvay policy is to contract only with registered and specialized waste management companies.

In many production processes, such as in PVC processes, the key hazardous wastes are already fully recovered and recycled, either by recycling or by thermal destruction with energy recovery in high performance incinerators, often operated on site.

■ Hazardous and non-hazardous industrial waste

Our policy:

- To focus on the reduction of industrial waste, and especially hazardous industrial waste;
- To limit landfill of hazardous waste to a minimum, aiming at zero landfill in the long run, by recycling or producing secondary raw materials;
- To maximize the recovery and recycling of residues whenever technically and economically possible in order to improve resource efficiency (raw materials).

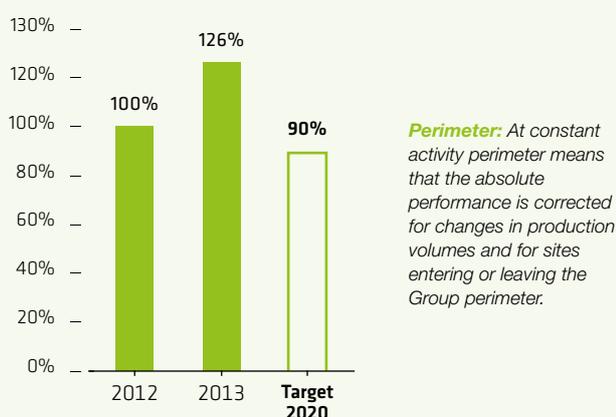
Solvay's 2020 target (*)

➔ To further reduce hazardous waste going to landfill by 10%.

(*) Base 2012, at constant activity perimeter.

Compared to 2012, landfilling of hazardous industrial waste increased by 26%. This figure relates mainly to the production of additional dangerous waste during the 3 yearly maintenance turn-around on the Chalampé (France) site and to process upset in Rosignano (Italy) (3 825 tons, while the overall 2012-2013 increase amounts to only 3 142 tons). The Group is confident that the defined -10% target will be achieved by 2020 despite those peaks in waste production.

➔ Landfilled industrial hazardous waste compared to 2012



■ Group performance (without correction for changes in activity perimeter)

➔ Total industrial waste



	2011	2012	2013
Total industrial hazardous waste (tons)	300 326	196 902	213 111
Total industrial non-hazardous waste (tons)	1 547 661	1 576 931	1 688 882

Perimeter: Solvay financial perimeter.

Legend: Definitions have been fully aligned with EU Directive 2008/98/EC and with the Eurostat Manual on Waste Statistics-2010. Total waste is divided into four categories; i.e. industrial waste, construction and demolition waste, mining waste, and domestic waste.

Hazardous industrial waste increased by 8.2% in 2013.

➔ Total landfilled hazardous industrial waste

	2011	2012	2013
Landfilled hazardous industrial waste (tons)	16 639	10 068	13 210

Perimeter: Solvay financial perimeter.

Landfilled hazardous industrial waste (a part of total hazardous industrial waste) increased by 31% in 2013, mainly due to the 3 yearly maintenance turn-around in the polyamide plant of Chalampé (France) and to process upset in the Rosignano (Italy) soda ash plant.

□ Management of waste

Taking into account technical and economical feasibility, Solvay applies the following hierarchy in waste management:

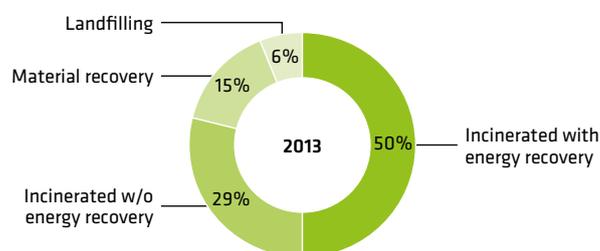
1. by priority and when possible, use of intrinsically waste-free technologies or source reduction;
2. recycling and reuse;
3. material recovery, energy recovery;
4. treatment before landfilling in absence of any alternative.

All sites promote internal reuse and recycling: regeneration of solvents and oils, recycling of catalysts, recovery of organic chlorinated waste, use of ammonium nitrate byproduct as fertilizer, recycling of silica and silicate sludge in cement production etc.

Hazardous industrial waste

A large part of hazardous waste is recycled and recovered, most often internally by Solvay, and a large part destroyed via high performance incineration with heat recovery. Landfilled hazardous waste represents only 6% of the total hazardous industrial waste. In 2013, hazardous industrial wastes increased by 8.2%, mainly due to the 3 yearly maintenance turn-around at the polyamide plant at Chalampé (France) and process upset in Rosignano soda ash plant (Italy).

➔ Hazardous industrial waste - breakdown by destination



Perimeter: Solvay financial perimeter.

Legend: Around 6% of our industrial hazardous waste is land-filled, directly or after an appropriate physico-chemical treatment.

Non-hazardous industrial waste

When it comes to non-hazardous waste, high-capacity soda ash plants in particular (almost 5 million t/y of soda ash manufactured by Solvay in Europe) generate large quantities of non-hazardous mineral inert waste. The composition of this waste, mainly sands and clays, depends on the type of limestone (CaCO₃) used as raw material and includes also some metals. Limestone not transformed in the process is also present in the waste as well as limited amounts of calcium sulfate (CaSO₄). These materials do not represent any significant environmental or health risk and. As their volumes cannot be reduced, they are stored in areas close to Solvay's manufacturing sites. Subsequently these storage areas are rehabilitated with adapted plant species and may become (Belgium, France, Italy) protected natural reserves due to their biodiversity. (For more details on biodiversity, the reader is referred to page 55).

Environment

Mining waste

Production residues from mining operations are non-hazardous waste, mainly limestone fines, other minerals accompanying the fluorite and barium strontium ores, and oil shale. The non-hazardous mining waste is inert and is generally backfilled in mining cavities. The variability of ores quality has a significant impact on the quantity of mining waste.

Organic chlorinated and fluorinated waste

This waste is thermally destroyed in Solvay installations with very high environmental performance specifications, generally recovering the waste materials into hydrochloric and hydrofluoric acids to be reused as secondary raw material. These units (Frankfurt, Porto Marghera, Tavaux) are also able to recover post-use (chloro) fluorocarbon products and SF6 recovered from customers. Policies exist promoting the development of collection schemes (SF6).

The main Solvay approaches for waste recovery and reuse

- Cooperation with waste management companies to promote recovery and reuse
- Recovery in the cement industry (if concentrations are high enough)
 - As mineral intake
 - Optionally as a fuel if sufficient carbon content. (Examples: organic waste from Coatis, fluorinated waste from Onsan and Porto Marghera, carbonated fines)
- Reuse of materials with an alkaline or acid content for neutralization of other flows: H_2SO_4 , HCl, $Ca(OH)_2$
- Waste with relatively pure chemical content for resale as "secondary" product (but with constraints due to purity constraints, transport restrictions): ex: $CaSO_4$ reused in building materials (road foundations, ballast etc.), as biological sludge or inorganic base in agricultural application (subject to local regulations) such as amendment of acid soils (Rheinberg).

□ Main incidents

No incidents with a significant environmental impact took place in 2013. Nevertheless, Two incidents with potential environmental consequences took place, with none of them ultimately incurring environmental impact for the surrounding ecosystem or for health of our employees or neighbours. They both are characterized by a failure of secondary confinement equipment. An action plan focussed on such equipments has been triggered since.

- (Clamecy, France) - A leak of nitric acid solution from a tank led to the loss of 200 tonnes which was collected in a pit. Because the pit was not fully waterproof, a part of the acid (less than 10 tonnes) was released to the nearby watercourse off-site. There were no environmental consequences.
- (Jemeppe-sur-Sambre, Belgium) - The temporary and exceptional use of a retention pit that proved not to be leaktight to store a mix of aqueous and organic effluents resulted in leakage into the soil. The leak was then channeled by the tank's drainage network to the natural environment. No damage was reported, thanks to the prompt reactivity of the site and external emergency services.

Corrective actions and more generally the prevention of accidents are undertaken as part of our process safety management system (For more details on process safety, the reader is referred to page 82).

In the coming year, existing methodologies will be improved to better assess the potential environmental consequences of possible accidents. The risk mapping throughout the Group will then be updated, and appropriate additional mitigation measures taken.

G4-EN24

Total number and volume of significant spills

Solvay classify and reports incidents with environmental consequences according to a gravity scale based on a range of criteria, including the volume of spills in relation to the nature of the emissions.

Our policy concerning environmental incidents is:

- To prevent process and transport incidents with potential impact on people, environment, equipment and assets through effective risk assessment and control;
- All Solvay sites should define and implement an "Emergency Preparedness and Response" plan, in line with the Group standard, including periodical simulations and emergency response training sessions.

Preventing accidents with environmental or human consequences is obviously crucial for a chemical company like Solvay. It is a key element of our societal responsibility.

Soil Management

Soil management is vital to Solvay: Like many other industrial companies, Solvay has to manage past soil contaminations from its own or acquired activities. Environmental legacies have to be managed in order to protect health and the environment and minimize image damage at acceptable cost. (For more details on environmental provision, the reader is referred to page 45).

Our policy:

- To prevent soil contamination;
- To characterize soil conditions whenever needed in concerned sites, in activity or closed;
- To manage the impact of soil/groundwater contamination in the surroundings of our sites.

Assessing soil conditions is a key step in order to define and implement the most appropriate treatments. Whenever needed, the sites concerned have been investigated.

For existing soil contaminations resulting from own past activities or from acquired activities, long-term control and remediation projects have been under way on most Solvay sites for many years. They aim is to assess, secure and remediate these situations. Solvay's soil management is in line with the most recent developments in this area.

The vast majority of governments and local authorities are today moving towards risk-based approaches. This means seeking the level of remediation and/or containment which will reduce the risk resulting from the contamination, in particular for the underground water, given the known intended use of the concerned land. In addition, the possibility of removing the original contaminants, in order to bring a definitive end to the necessary soil management measures, is increasingly being assessed as well.

□ Technical approaches

A range of technologies are currently used in Solvay sites, according to prevailing local conditions:

- Natural attenuation, capitalizing on the spontaneous activity of the underground ecosystem;
- Treatment in-situ of the contaminant (chemical oxidation, chemical reduction thermal treatment, bioremediation etc.);
- Containment by physical barriers or hydraulic barriers with treatment of the extracted water.

In the coming 2 years, a focus will be on further developing dedicated processes or technologies to achieve more extensive treatment of specific contaminations, in collaboration with universities, other companies, authorities or institutions (Ex: France) Silphes project for Tavaux (France), European Nanorem project for Zurzach (Switzerland) and others).

A number of sites belonging to the Solvay group, in particular in Italy, are currently under investigation by the authorities for past soil contaminations.

Long term soil remediation at Jemeppe (Belgium)

The area was used as landfill by Solvay from 1906 till 30 years ago. Since then a major important remediation project has been undertaken. First, on this 8 ha area, a natural capping was installed, during the late 80's, with 200 000 tons of fresh earth and the (re)plantation of 1 000 poplars trees. This significantly reduced rain water percolation and the movement of contaminants outside the concerned soil area, giving significant control of the chlorinated organics and salts present in the soil. In 2006-2007, studies started with the expert consultant Ecofox to assess the possibility of further preventing migration outside the area and better protecting the surrounding surface and ground waters. After careful investigation of water flows and concentration profiles (more than 100 water monitoring wells were installed), the contaminated zone was physically contained by creating slurry walls in the soil to channel water movements. For more than 6 years now, the captured water flow has been pumped and treated. Samples taken downstream from the containment walls now show that contamination has been dramatically reduced.

Products and services

Our policy concerning ecoprofiles of products is:

- To maintain a comprehensive understanding of hazards, risks and environmental impacts of our products, and for that last purpose in a "cradle to gate" or "cradle to grave" approach, using the Life Cycle Assessment methodology.

The running target is to have ecoprofiles for:

- All major products;
- Any product with sustainability-critical characteristics;
- Any new product or process.

	2011	2012	2013
% product with ecoprofile	55	67	77

Legend: coverage of product portfolio (based on turnover) with a representative ecoprofile. The representativeness of ecoprofiles takes account of the quality of data in line with the LCA methodology.

□ Managing product environmental profiles

Extensive eco-profiles (cradle-to-gate) are established for the largest part (77%) of Solvay products. These support:

- For more details on Sustainable Portfolio Management, the reader is referred to pages 35-39;
- Promotion of selected products;
- Comparative assessment of products in R&I projects.

In 2013, a significant number of additional ecoprofiles were established for the Novecare Business. As the number of products of this business is very large, a selection of key molecules/formulations was made, based on the intrinsic properties of the products, to ensure an adequate coverage of the business portfolio.

Another axis of progress is the constant focus on completeness of environmental data inventories and the adaptation of the models to improvements in international databases. Some more extensive studies have also been undertaken, for instance the calculation of the full environmental footprint of epichlorhydrin in the new Epicerol process. A similar calculation has been undertaken for the new Augeo™ new line of solvents based on renewable raw materials, combining performance, competitiveness and sustainability (see box).

The limiting factor for the remaining products still lacking a full eco-profile is often the difficulty of obtaining such data for the raw materials used to produce them. These may be very diverse and of multiple origins, with no reliable data yet available from suppliers or regular databases.

□ Life-cycle thinking for research projects

For these projects, the method was recently improved. It now covers each stage of a product's development, highlighting at an early stage the benefits and potential environmental risks, as well as the market alignment - or not - with sustainability megatrends. (For more details on Assessment results for the "Aligned and Star" category - product portfolio, the reader is referred to page 37).

Ecoprofiles and lifecycle assessments by Solvay

An ecoprofile is the calculation of selected environmental impacts of a product, from raw materials to the saleable product, including all manufacturing steps ("cradle-to-gate" approach).

Ecoprofiles permit extensive internal benchmarking and publication of results through producers associations, which usually aggregate the data into average, multi-manufacturers ecoprofiles.

Ecoprofiles are also used for Solvay's Sustainable Portfolio Management (SPM) assessments as input for assessing the environmental impact of manufacturing (For more information on SPM, the reader is referred to page 35). Finally, ecoprofiles are typically used by customers to calculate Lifecycle Assessments (LCAs) of a given application made with our products.

Solvay embarks on world class LCA platforms

With LCA methods moving fast, how does one remain at the forefront of LCA science?

Solvay is part of a high level research platform on LCA methodologies coordinated by Ciraig(*), via a 5-year collaborative program 2012-2017 with 15 industry partners.

The goal is to:

- Establish long term collaboration and benefit from world-level expertise;
- Keep abreast of moves by frontrunners;
- Enrich own sustainability assessment tools (LCA methods, SPM etc);
- Take better account of social impacts, bio-sourcing, water footprint etc.

Solvay is also active in WBCSD(*) working on Guidance on Life Cycle Metrics for assessing and reporting by the Chemical Sector", with the aim to ensuring consistent communication of product environmental footprints by the chemical sector. The guidance on "GHG avoided emissions" has also been recently established.

(*) CIRAIG: Canada.

(*) WBCSD: World Business Council for Sustainable Development.

G4-EN27

Extent of impact mitigation of environmental impacts and services

Solvay, as a chemical company, sells products that are most often only a part of the final product. Many actors along the value chains have their role to play for chemicals to be transported, stored, used and disposed of safely, both for people and the environment. In this respect, Solvay is active in establishing ecoprofiles of its products, in deploying product stewardship programs, in recycling of end-of-life products, and in supplying adequate information to ensure the safe handling and used of products by the down stream users, a key feature of risk mitigation when dealing with chemicals.

For more details on product responsibility and product stewardship, the reader is referred to pages 101-107.

G4-EN28

Percentage of products sold and their packaging materials that are reclaimed by category

Within the lifecycle of a product, Solvay is usually one player among others in the recycling initiatives and the management of the end of a product's lifetime. This holds true when products are manufactured and sold by Solvay and for third parties' products. Quantitative indicators are difficult to establish due to the diversity of products, applications, stakeholders, and given the complex perimeters to be taken into account. Solvay has been very proactive in developing recycling technologies and schemes and in promoting initiatives through various channels and in particular specialized federations initiatives.

■ End-of-life product recycling

Our policy is:

- To develop and encourage new recycling technological processes: the strategy is to bring our know-how to the development of new or improved technologies;
- To encourage the setting up of waste management schemes involving collection, recovery and recycling of waste at regional and national levels;
- To contribute in the reuse of secondary raw materials (urban mining, industrial ecology, bio-sourcing, etc), taking into account the overall life cycle assessments.

□ Contribution to the recycling at the end of lifetimes - key Solvay products.

VinylsPlus: More than 400 000 tons of PVC recycled in Europe, target of 800 000 tonnes per year by 2020

SolVin has been a key initiator and catalyst of the Vinyl 2010 Voluntary Commitment, the objectives of which have been largely met (> see details on www.vinyl2010.org). SolVin is again a key player in the renewed VinylPlus commitment, with a wider scope introducing new areas such as energy and resource efficiency, climate change and

sustainability awareness, and covering additional PVC waste streams, including automotive, electric & electronic and packaging. One of the most important VinylPlus challenges is to achieve higher recycling rates and to develop innovative recycling technologies. In 2013, PVC recycled volumes reached over 400 000 tons in Europe in the framework of VinylPlus (www.vinylplus.eu).

VinyLoop® process for recycling PVC waste

Solvay is engaged in VinyLoop®, as the only PVC producer with its own recycling activity. Contributing to VinylPlus, this highly innovative recycling technology enables to recycle complex composite materials where traditional recycling methods cannot be employed. The VinyLoop® filtration-based recycling process is now in its eleventh year of operation at Ferrara (IT).

In 2013, VinyLoop® further improved its track record. The process is ISO 14044 compliant, the plant is REACH certified and fully complies with European regulations. In 2013 the updated "White Paper" presents 76% lower water consumption than virgin PVC, 47% lower climate impact and 40% reduced primary energy consumption. Recycled PVC is recognized as a "textbook example" of how to cut natural resources use. Solvay is now looking to license the technology to third parties.

> See www.vinyloop.com.

→ PVC recycling via Vinyloop

	2009	2010	2011	2012	2013
PVC waste received -tons	4 806	5 657	7 549	6 846	7 876
PVC Recycled - tons	3 123	3 615	4 422	4 701	4 875

Recycling rare earths from low-energy lamps

Solvay now has industrial capacities for the distinctive recycling of the six rare earths contained in the fluorescent powders of spent low-energy light bulbs. After reformulation, the rare earths can be re-used in new low-energy light bulbs, making the life-cycle of these energy savers even more sustainable. This development consolidates Solvay's technological leadership as a rare earth formulator. Solvay is now able to offer customers a closed loop for their fluorescent rare earth powders. Recycling units are operational in Saint-Fons and La Rochelle (France). Both sites recycle the six rare earths – lanthanum, cerium, terbium, yttrium, europium and gadolinium – present in the fluorescent powders.

Recycling rare earth from rechargeable batteries and magnets

Solvay has also partnered with Umicore to recycle rare earths from nickel-metal hybrid (NiMH) rechargeable batteries in portable applications, hybrid electric vehicles etc. A third aspect of rare earth recycling focuses on recycling rare earths contained in magnets to reformulate the neodymium, the praseodymium, the dysprosium and the terbium, four rare earths contained in these magnets. Such magnets are widely used in windmills, electric vehicles and hard disks.

Ecoservices: "Spent" sulfuric acid recycled

The Ecoservices business is focused on North America where it is the market leader in producing and regenerating sulfuric acid, one of the most widely used chemicals in the world. Eco Services network of eight production units at six sites services approximately 50% of the 2.3 million ton sulfuric acid regeneration market in North America. The

Environment

key customers are petroleum refineries, which utilize a high-strength sulfuric acid as a catalyst to produce alkylate, a high-octane component of gasoline. "Spent" sulfuric acid is transported to Eco Services sites where it is regenerated in high-temperature furnaces. The regenerated sulfuric acid is then transported back to the customer. The major refinery customers are located along the U.S. Gulf Coast, West Coast and Mid-West regions, as well as in Canada.

SOLVAir®: 100 000 tons/year recovery capacity for waste incinerators residues

The depollution process developed by Solvay to neutralize acidic flue gases in waste incinerators has been successfully implemented at many waste incinerators in Europe, as well as a number of coal-fired power plants and other incineration facilities. For the past 15 years, Solvay has also developed the recycling of salt residues recovered from incinerator flue gases after neutralization with sodium bicarbonate. Solvay now has a 100 000 tons/year recovery capacity for these wastes. The purified sodium chloride is then recycled in soda ash manufacturing, replacing "virgin" salt. The SOLVAir® service, consisting of taking back the salt residues and purifying them, operates from installations in France (Resolest®) and in Italy (Solval®). Both have now a 50kt capacity, with a recent authorization for capacity extension in Italy.

The reactivity of sodium bicarbonate BICAR® is high over a wide moisture content and temperature range. In this way the neutralization process avoids the water injection for cooling/conditioning purposes and upstream reheating of the flue gas found in a catalytic DeNO_x systems (SCR). By savings in flue gas reheating (and by optimizing heat recovery), energy efficiency of waste incineration is boosted, offering the best energy recovery rates as compared to alternative fume treatment processes.

> See: www.solvairsolutions.com.

Recycling initiatives for polyamides

Solvay Engineering Plastics has launched a cradle-to-gate life-cycle analysis of the environmental footprint of Technyl® A718 V30. Technyl® Eco is made entirely of post-industrial polyamide scraps (fibers & yarns), first depolymerized then repolymerized before being transformed into pellets. Technyl® Eco's mechanical performance and durability enable it to be used in applications with the same weight and design as those manufactured from primary polymer. Outstanding results of the assessment demonstrate: -69% CO₂ footprint; -76% non-renewable resources consumption. Indicators for potential impacts to human health and ecosystems are also improved and water consumption is dramatically reduced.

Sulfur hexafluoride (SF6) recycling

SF6 is a highly efficient, highly valued insulating gas for medium and high voltage equipment. SF6 allows simplified design of switchgears mainly because of size reduction, quiet, and reliable handling and maintenance. As SF6 has a very high Global Warming Potential (GWP), its emissions must be carefully avoided. Solvay Fluor offers a worldwide recycling service for SF6, open to all users, in Bad Wimpfen (D) as well as in Onsan (South Korea). The United Nations Framework Convention on Climate Change (UNFCCC) has recognized Solvay's SF6 recycling efforts and registered a particular SF6 recovery and reclamation Clean Development Mechanism (CDM) project in South Korea.

In 2013 Solvay experienced a growing interest in its SF6 ReUse service, with 40% more volume recovered for further reclaiming as compared to 2012. In order to keep up with this development we have expanded and upgraded our SF6 ReUse capacities in 2013 to be ready to handle the continuously increasing volumes of returned used SF6 in our recovery and reclaiming process. This trend is expected to continue. In this way the Solvay SF6 ReUse Process is one of the main backbones of the industry efforts to avoid emissions of SF6. The recycled product exceeds all industry specifications.

→ Fluorinated/chlorinated hydrocarbons (CFCs, HCFCs, HFCs) recycling

	2010	2011	2012	2013
Recycling of fluorinated hydrocarbons (CFCs/HCFCs/HFC mixtures) - tons	307	546.2	450.6	450.9

With a high temperature treatment facility in Frankfurt (Germany), Solvay offers a recovery service for ozone-depleting CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons) gases, as well as HFCs (hydrofluorocarbons) which have relatively high Global Warming Potentials. These gases are regulated to prevent releases into the atmosphere. Solvay's unique installation is operated in line with the requirements of the European Union waste directive and produces secondary raw materials – hydrofluoric and hydrochloric acids – that can be reused in industrial processes. As recovered quantities, mainly from refrigerator disposal, are generally increasing, we expect that volumes treated in our Frankfurt facility will increase in the medium term. In the longer term, as sales quantities on the European market should gradually decrease following a recent legislative proposal, HFCs and their blends from other applications are expected to be also increasingly recovered, and recycled by users.

□ Chemicals recycled indirectly

Many chemicals manufactured by Solvay are consumed and transformed during their use and can therefore not be recycled. Others are indirectly recycled, like soda ash, a significant constituent of glass (±20%), indirectly recycled via the very efficient glass recycling schemes.

Transport

■ Transport safety

When faced with potential transportation hazards, chemical companies rely on sophisticated technologies and decades of safety and security expertise to deliver their products safely by barge, pipeline, rail and truck. Numerous safety and security laws regulate the transport of chemicals. Chemical producers work with scores of international, national and local regulators and with transportation partners to ensure reliable delivery and transportation safety. But accident prevention must continue to be a constant thrust.

Our policy:

- To prevent process and transport incidents with potential impact on people, environment, equipment and assets thanks to effective risk assessment and control.

→ Accidents during transport and distribution (2013)

Reported accidents and incidents during loading, transport, unloading and distribution of Solvay products	207
per Gravity level	
L (Low)	175
M (Medium)	32
H (High) or C (Catastrophic)	0

Legend: According to Solvay gravity scale. Transport accidents reported encompass 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 Solvay is the charterer. The reported events are the incidents that occurred at Solvay premises or those that have been reported by transporters and third parties to Solvay.

□ Management of transport safety

In 2013, no level C (catastrophic) or H (high) accident occurred. A total of 207 events during transport and distribution were reported at Group level, with 32 level M (medium) and 175 level L (low) accidents. The modification of accident classification criteria in 2012 prevents full comparison with previous years' figures. In 2013, a common method for reporting and assessing transportation accidents was defined for the Solvay and Rhodia legacies.

In 2013, a number of preventive actions were taken to reinforce accident prevention and mitigate potential consequences:

- Developing a global network of Dangerous Goods Safety Advisers in all zones. An internal certification process has been set up based on macro-tasks related to transport safety;
- Progressively reinforcing site "Emergency Preparedness and Response" plans in our plants to cover off-site emergencies related to transport and distribution, including periodical simulations and emergency response training sessions.

Additionally:

- For selecting logistic service providers - a key pillar of transport safety – Solvay continued to rely on a variety of schemes (see box below);
- For world-wide emergency assistance, Solvay continued to rely on the worldwide service Carechem24 (and Chemtrec in the US). This service answers any caller anywhere in the world, supplying technical advice in his/her language 24 hours a day, 7 days a week. Phone numbers to be used are displayed in the Safety Data Sheets and on the transport documents and on labeling;
- Solvay sites also offer assistance in their areas via the national chemical emergency plans in Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, Thailand, United Kingdom and the USA.

Selection of logistic service providers

- Solvay has for many years used the Cefic European SQAS (Safety and Quality Assessment Systems) to assess the safety, security, quality and environmental standards of its European logistics service providers (road and rail transport of dangerous goods);
- Solvay uses also the European Barge Inspection Scheme (EBIS) for inspecting chemical barges operating on inland waterways in Europe;
- For bulk sea transport of dangerous products (liquids and gas), Solvay has developed its own rating system based on the CDI (Chemical Distribution Institute) reports, for rating at worldwide level all the sea bulk transporters transporting its products.
- 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.

A good example of transport safety in India

Recently Solvay Specialties India become member of the Nicer Globe community, an initiative to enhance Transport Distribution Safety, Emergency Response & Transport Security. GPS devices will be installed on our inbound vehicles to monitor various parameters related to transport safety.

Increasing the safety of hydrogen fluoride transportation

In 2013, an investigation was been undertaken of all loading and unloading practices in all Solvay sites handling anhydrous hydrogen fluoride, following the catastrophic accident at Gumi in South Korea (not a Solvay transport). Audits have been performed in all sites using the questionnaire of the Comité Technique Européen du Fluor and the US Hydrogen Fluoride Industry Practices Institute. In addition to audits, some installations have been reviewed via a process safety risks analysis to ascertain that the residual risk is acceptable.

Supplier environmental assessment

G4-EN32

Percentage of new suppliers that were screened using environmental criteria

The reader is referred to page 93.

Social contents

Labor practices and decent work	74	Society	94
Employment	74	Local communities	94
Occupational health and safety	78	Anti-corruption	98
Training and education	87	Public policy	98
Diversity and equal opportunity	89	Anti-competitive behavior	99
Equal remuneration for women and men	90	Compliance	99
Supplier assessment for labor practices	90	Supplier assessment on society	100
		Grievance Mechanisms for impact on society	100
Human rights	92	Product responsibility	101
Freedom of association and collective bargaining	92	Product stewardship	101
Supplier human rights assessment	93	Sustainable products and solutions	102
		Customer health and safety	104
		Product and service labeling	106
		Marketing and communications	107

Solvay's main challenge is to bring together a wide range of people, in over 55 countries, to serve the new ambition of the Group. The Group's growth aspirations and challenging projects in all fields of the organization require making optimal use of its human capital.

Since 2013, Solvay has adopted a "BU-centric" organization model centered on autonomous and accountable Global Business Units (GBU). As a driver of change, Human Resources is adapting its vision and mission to addressing new challenges: providing day-by-day support to the operating entities, promoting employee development, and increasing the attractiveness of Solvay to today's and tomorrow's talent.

A team of 600 people worldwide is mobilized to achieve these objectives. While structured to respond to local needs, as expressed by the GBUs, the HR team also provides the Group with a global vision of its skills requirements.

In 2013, this team worked to strengthen the cohesion of the Group by harmonizing policies and processes, and helping deploy the new culture of performance and accountability.

□ 2013 Main developments and actions

Solvay has completed several projects that respond to key social issues facing the Group over the coming years. Priority has been given to projects that are crucial for integrating the legacies of the former groups and for deploying the People model:

- New compensation policy;
- Common job grading system;
- New Performance, Development and Career review (PDCR);
- "Fast Track Project": common processes and tools available online to all the Group's employees. Launched in December 2013, it provides a suite of HR services including organization charts, appraisal process and compensation reviews;
- Executive development & succession planning process;
- New Employer Branding campaign;
- Talent committees;
- Launch of the first Solvay Way self-assessment tool, made available to all 30 000 employees, covering 11 practices regarding employability, quality of social dialogue, employees' fundamental human and social rights, employee health and safety and employee motivation. Assessments have been carried out at all production sites and R&I centers;
- Labor practices: signing of the Global Agreement on Social and Environmental Responsibility between Solvay and IndustriALL Global Union. For more details, the reader is referred to page 11.

Next year the Solvay Human Resources Department will continue to deploy actions designed to serve the creation of a single, united Group; by fostering individual and collective performances and development, and by making these tools and approaches available to all employees.

□ Health and safety in the workplace

High safety standards and their constant improvement are an integral part of the Solvay's Code of Conduct. The Group has a long-lasting commitment to provide safe and healthy working conditions on its sites for both its employees and contractors. Solvay also recognizes the need for an appropriate work-life balance. Each employee is expected to contribute to the safety of the workplace by being alert and aware of the rules, policies and procedures and by reporting any unsafe situation.

In 2013, focus was placed on aligning HSE key processes between the 2 legacies:

- HSE performance reporting;
- Risk characterization in all HSE fields, in particular industrial hygiene;
- Regulatory compliance, especially regarding product safety;
- Dedicated process for managing of substances of very high concern;
- Medexis for managing hygiene and health data;
- Defining an HSE roadmap until 2016 for all operational entities.

In 2014, deployment of the new processes will continue. A new Group HSE management system (SCMS) will be tested ahead of large-scale implementation at manufacturing sites in 2014.

□ Organization

Human Resources (HR) issues (such as diversity and equal opportunity, training and education, employment, labor relations) are overseen by the Group's Human Resources General Manager, who is responsible for overseeing strategy, performance, and compliance. By 'Human Resources', the Group understands 'all people employed by a Group company'.

Occupational Health and Safety management is overseen by the HSE department which is part of the Industrial Function Management of the Group. Two specific departments, one directed by an Occupational Safety manager and the other by an Occupational Health manager, define the new strategy, procedures, programs and tools at global level.

LABOR PRACTICES AND DECENT WORK

Employment

Solvay commits to developing people by offering exciting career paths, challenging opportunities, and by building skills for the future. In addition to this Solvay is committed to aligning its workforce with the needs for implementing sound business strategy. Policies and processes have been developed and launched to allow attraction, ensure retention and foster development of the Group's employees.

In the subsequent paragraphs the basic data on Solvay's employees are given - covering the present status and its development from year to year. The data indicate how the Group's strategy is transforming its human capital and makes apparent the opportunities the Group offers to its employees.

Data shows:

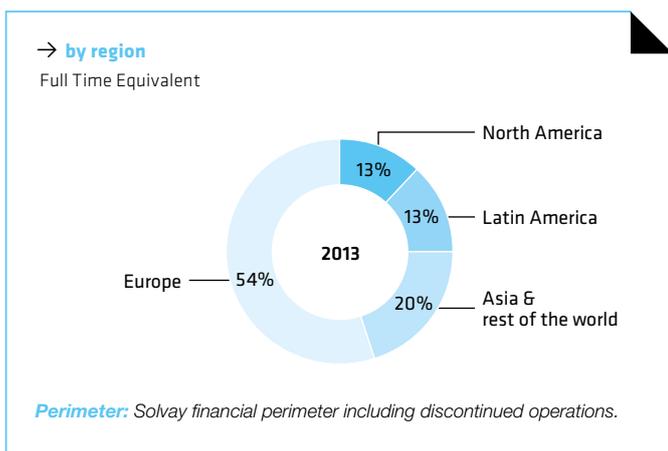
- Geographic distribution of personnel is almost proportional to respective business size;
- Voluntary resignation levels continue to be low;
- Internal mobility is a well-established practice within the Group.

More detailed information on the ways the Group fosters the development of its personnel and how it ensures internal equality, diversity, and engagement are given in subsequent sections.

Structure of Employment (G4-10)

In this first sub-section basic figures are given describing the workforce, categorized by to region, age, gender and mobility.

■ Employment by region



	2012	2013
Europe	15 941	15 808
Asia & rest of the world	5 920	5 988
Latin America	3 803	3 922
North America	3 439	3 671
Total FTE (Total HC)	29 103 30 252	29 389 30 036

Perimeter: Solvay financial perimeter including discontinued operations and the 227 employees of Chemlogics.

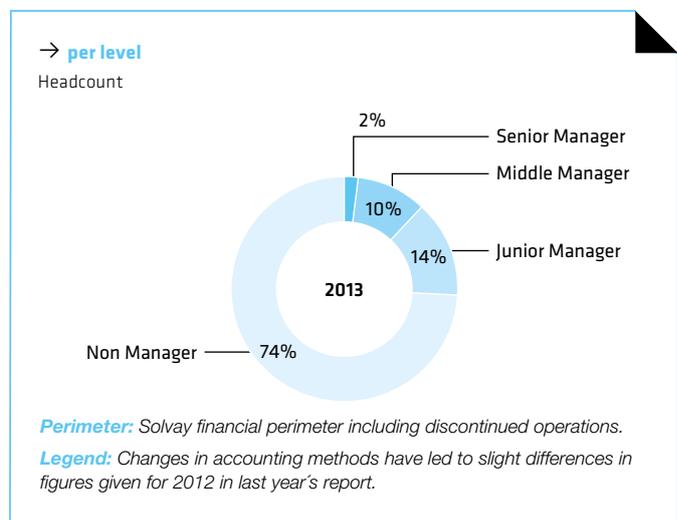
The Solvay Group, headquartered in Brussels, employed at the end of 2013 slightly more employees than one year before. This figure includes the employees entering the Group through the acquisition of Chemlogics in the US.

The distribution chart shows that 45% of Solvay FTEs are employed outside of Europe, with around 20% in Asia and the Rest of the World, and about 30% in the Americas. From 2012 to 2013 the number of employee in Europe area has slightly decreased.

The Group has reinforced its presence in fast-growing countries and regions. The presence covers all business aspects including commercial, industrial, research and managerial functions (7 Global Business Units are managed outside of Europe).

The employment structure follows this development. The Group recruits where it has its activities, in order to capitalize best on the capabilities of the local workforce. It follows, therefore, that regional repartition of employees is going to become more and more proportionate with repartition of sales. This will also help the Group to ensure societal acceptance of its businesses in the regions.

■ Employment by level



→ per level
Headcount



	2012	2013
Senior Manager	480	472
Middle Manager	2 956	2 905
Junior Manager	3 895	4 343
Non Manager	22 921	22 316
Total	30 252	30 036

Perimeter: Solvay financial perimeter including discontinued operations.

Legend: Changes in accounting methods have led to slight differences in figures given for 2012 in last year's report.

The graph shows the categorization of the Group's managers (cadres) according to broad hierarchical levels. Please note, the categories given cluster together several grades.

□ Grading

The evolution essentially results from the reclassification of previous legacy grades into the new Solvay grading system, applied across all management functions of the Group.

To consolidate its ambition as a global entity, Solvay has introduced tools to measure and compare jobs both internally and externally on a worldwide basis. At the end 2012, the Group introduced its present new global grade scale, which was rolled out in 2013.

The basis for the management grading is an evaluation of the manager's position. The evaluations used to decide in which grade each job is classified are based on a method also applied by other companies (Hay).

This system aids the integration of acquisitions and creates a shared language on the hierarchical career development path, as well as offering benchmarking.

□ Job Families

For 90% of manager functions the grades are combined, along with descriptions of the job content and the skills required for the position, into a single "job family" document which is categorized in the job catalogue in order to show the career ladder.

Each job family description follows a standard format and identifies:

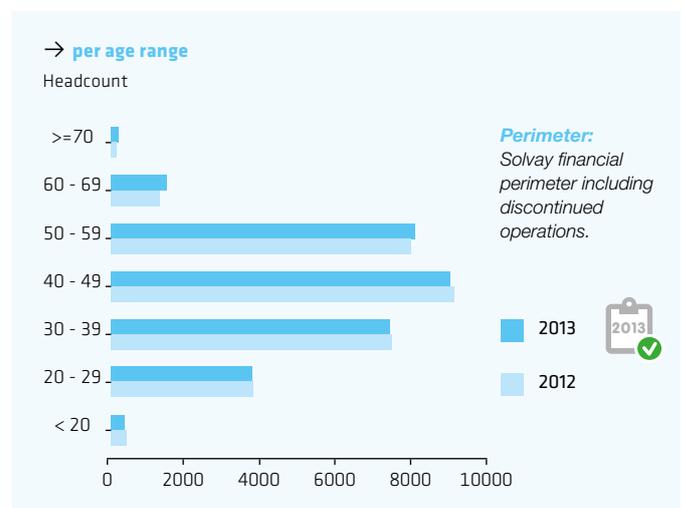
- The mission of the job;
- Key responsibilities;
- Expertise requirements;
- Competencies requirement;
- The job levels with associated key differentiators.

As all of these documents are made public internally they help managers to communicate the challenges of the job and ensure that all Solvay's employees covered understand their roles and responsibilities in their current functions, while obtaining visibility on what is required in order to progress in their careers.

A foundation is also laid for other processes such as Workforce Planning, Staffing, Career Management, International Mobility, Performance Management, the Reward process, Payroll and Data Management and the skill mapping.

All manager positions are covered. The extension of this model to non manager positions is envisaged, depending on the particularities and interests of the Group's sites.

■ Employment by age range



Perimeter: Solvay financial perimeter including discontinued operations.

The graph shows the repartition of the Group's workforce per age range. It appears that more than a quarter of this population is between 50 and 59 years old.

Demographic evolution of Solvay employees is recognized as one of the risks for sustainable development of the Group.

Initiatives to mitigate the risks stemming from such a development have been taken on several levels:

- Methods for monitoring the situation and detecting critical populations are available for all managers of Group entities. These methods guide management in defining critical skills and roles, starting from the strategic objectives, and in simulating the outcome of various scenarios. Guidance is given in developing actions in order to mitigate the risks.
- A study was made upon the initiative of Solvay by the University of Louvain which canvassed managers older than 50 on their specific expectations of professional life.
- Based on a joint initiative of managers and members of the European Works Council (EWC) a set of recommendations was developed that included:
 - Improving work-life balance;
 - Adjusting (ergonomic) working conditions;
 - Implementing strategic learning plans at site level;
 - Fostering mobility (geographic and functional) with dedicated learning opportunities;
 - Increasing young talent attraction (partnership with schools) and improving image of the Company in the market.

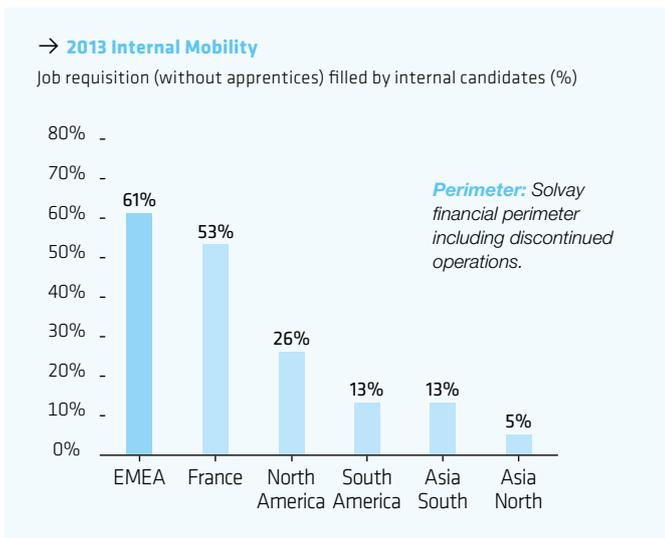
Social

Labor Practices and Decent Work

Employee mobility

The Group's approach is to ensure that employees can move across functions and countries in order to develop their skills and increase the cross-geographical and/or cross-business exchange of capabilities.

Internal moves - Percentage of open positions filled by internal placements by Regions



The Group fills more than one third of its open positions by internal placements. It encourages such internal moves as this reduces the cost of on-boarding and the risk of failure in the new position, as compared to external recruitments.

For employees, internal mobility represents the possibility of finding new opportunities in a familiar environment. It gives a long-term perspective to the employee's career expectations. It also opens up opportunities to integrate the different parts of the Group.

In Europe the percentage of internal placement is higher (up to 60%), in other regions lower (5% in Asia North). This is also an indicator of the degree of dependency on the external market or on the internal talent pipeline.

Internal placements cover all positions, manager as well as non manager.

Out of the above-mentioned internal placements, 151 were cross-national border in 2013, a part of them filled by international assignments.

International mobility - Number of employees on assignment for the Solvay Group in foreign countries

The total number of assignees and their repartition per home and host Region is given in the subsequent table:

→ International assignments	To Region					
	Europe	Asia & Oceania	North America	South America	Africa	Total
From Region						
Europe	231	76	42	9	2	360
Asia & Oceania	18	27	2			47
North America	19	12				31
South America	23	1	6	7		37
Total	291	116	50	16	2	475

Perimeter: Solvay financial perimeter including discontinued operations.

The figures show a focus on international assignments to and from Asia that corresponds to the attention the Group currently attributes to this region.

The Group uses international assignments to foster cross-cultural exchange and to develop the skills needed to work in a global business. This also increases the subsequent employability of individuals and thus the value of Solvay's human capital.

For the individual it may constitute one of the exciting career experiences that a global group may offer. As the cost of assignments is relatively high the number of expatriations is regularly reviewed and adapted to business needs.

G4-LA1

Total number and rates of new employee hires and employee turnover by age group, gender and region

The paragraphs in this section show the number of hirings and the employee turnover of the group.

Hiring

→ Hirings per Region



	2012	2012%	2013	2013%
Asia & rest of the world	524	25%	453	22%
Europe	888	43%	991	48%
Latin America	439	21%	376	18%
North America	211	10%	232	11%
Total	2 062	100%	2 052	100%

Perimeter: Solvay financial perimeter including discontinued operations.

Legend: Changes in accounting methods have led to slight differences in figures given for 2012 in last year's report.

The data show the number of entries in past two years per Region, and this number as a percentage of the total number of entries across all Regions.

Entries also comprise employees delisted in one company and attributed to another company due to reorganization; explaining the increase in Europe and North America in 2013. However, the percentage of “Entries” in Europe and North America is still considerably below of their share in the total workforce (54% in Europe and 12% in North America).

The Group has filled its hiring needs in all regions, thereby demonstrating its attractiveness to employees.

Voluntary leaves increased slightly in 2013, yet as a percentage of Solvay’s total workforce the figure remains low, indicating that the Group’s retention efforts are successful.

■ Global turnover

This table shows all employees leaving the Group’s companies, whether involuntary (including expiration of contract, redundancies, death, long-term disablement, notice for cause, retirement and other) or voluntary (resignation).

→ All Leaves

	2012	% of group HC	2013	% of group HC
Asia and Rest of the World	422	7.1%	449	7.5%
Europe	989	6.0%	968	5.9%
Latin America	414	10.2%	432	10.3%
North America	186	5.3%	239	6.7%
Total	2 011	6.7%	2 088	6.9%

Perimeter: Solvay financial perimeter including discontinued operations.

Legend: Changes in accounting methods have led to slight differences in figures given for 2012 in last year’s report.

→ Voluntary leaves

	2012	% of HC	2013	% of HC
Asia and Rest of the World	182	3.1%	254	4.3%
Europe	149	0.9%	203	1.2%
Latin America	107	2.6%	140	3.4%
North America	50	1.4%	60	1.7%
Total	488	1.6%	657	2.2%

Perimeter: Solvay financial perimeter including discontinued operations.

Legend: Changes in accounting methods have led to slight differences in figures given for 2012 in last year’s report.

Occupational Health and Safety

Occupational Health

Solvay understands the health of its personnel in the widest definition; that is to say embracing a high degree of physical, mental, and social well-being. The health of employees is a result of their past and present working environment, in particular the industrial hygiene conditions. Solvay has a forward-thinking organization with acknowledged experts in occupational medicine, and industrial hygiene and toxicology; with many synergies between these fields. The occupational physicians direct the Group's policies, standards, methods and medical protocols, with an understanding of the health risks specific to Solvay's activities. This is contributing to establishing a universal high level of medical surveillance by the various medical teams across the Group. The Medexis project has been recognized as exemplar in this respect by peer companies.

The reporting and careful analysis of occupational diseases provides the basis for better protection for all workers in the future, triggering more in-depth investigation into the industrial hygiene conditions concerned and deploying dedicated awareness programs. Any cases of occupational disease are important signals used to improve the occupational health conditions of the overall employee population.

Risk-related work management is, of course, a key factor in protecting employees.

Occupational Safety

Solvay's 2020 target:

➔ To reach a Medical Treatment Accident Rate (MTAR) lower than 1.0.

Putting safety first is a part of Solvay's Code of Conduct. Solvay has constantly improved its safety results, and remains among the best in the industry. To further improve its performance, the Group has set up new safety target: by the end of 2014 to reduce by 30% both the number of irreversible accidents and of accidents with chemical contact.

The Group has also developed new programs and practices that have already proven their worth, such as the "human factors" programs that promote management involvement and safe behaviors in everyday tasks. The top-down safety leadership is also achieved by implementing several new management practices under the banner of a new "Safety Initiative" launched in 2012.

Solvay sites rely on recognized safety management systems (OHSAS, US Responsible Care Management System etc) and on an in-house system, the Solvay Care Management System (SCMS). For several years an in-house management system, compiling all key requirements, has been deployed in a large number of the Group's sites, and will continue to be rolled out across the entire Group. This in-house system addresses all areas of HSE management, and can therefore be certified under verification schemes, such as Occupational Health & Safety Assessment Series (OHSAS) 18001, Voluntary Protection Programs (VPP) or equivalent, US Responsible Care, ISO 14001, EMAS, according to business and local needs.

a. Management of personnel well-being & stress

The Group has recently redefined its Code of Conduct, which very explicitly assures a working environment devoid of harassment. The Code of Conduct also commits everyone to ensuring trusting and constructive relations within the company. As part of the Group Health and Wellbeing policy, a guidance on stress prevention allows

each entity to launch local programs. A variety of actions have since been taken, mainly in European countries.

➔ Health awareness programs in sites

Stress prevention: number of programs	40
---------------------------------------	----

The promotion of well-being at work relies on:

- A working organization adapted to each individual, with clear definition of roles and responsibilities and adequate training and resources;
- The assignment of balanced workloads and objectives. Achievements to be discussed during an annual personal appraisal and decisions made on realistic, mutually-agreed objectives;
- Preparing and supporting employees during changes in the organization (via training);
- Offering opportunities for personnel development (through the annual appraisal);
- Leadership and empowerment (key aspects of People & Management Model);
- Safe working conditions (For more details on occupational health and safety, the reader is referred to pages 78-86).

Since 2003, the Solvay group has been engaged in the prevention and management of stress, in conjunction with the Stress and Well-Being Charter based on the values of the Group. A variety of actions have been taken, mainly in European countries, sometimes preceding legal obligations and always with the involvement of social partners. The Group has gained maturity and multidisciplinary expertise on the issue of stress, which will further support programs elsewhere in the Group.

Following the merging of the Solvay and Rhodia organizations, local actions have been taken to cope with the cultural and organizational changes and with individual uncertainties. Dedicated training programs have been given to managers in France by the medical coordinator, and also with the support of the "Institut Français d'Action sur le Stress", and in Belgium at headquarters via a "Transition Coaching Program".

Operational managers, Human Resource managers and occupational physicians have a key role in preventing and managing individual stress situations.

Identifying stress situations is the basis of any corrective actions program, and the following channels are instrumental in identifying potential stress situations:

- Annual formal evaluations for every employee;
- Day-to-day management;
- Vigilance of occupational physicians (a group reference tool is available to all physicians);
- Dedicated programs when relevant. The steps to identify stress situations in a typical site's program include awareness and training, stress assessment, actions plan and monitoring, and communication.

In France in particular, discussions with trade unions about stress and psychosocial risks prevention have been under way since 2009. A collective agreement was concluded in 2010 and, consequently, 900 managers and actors involved in stress prevention were trained by the "Institut Français d'Action sur le Stress". At every Group site a psychosocial risk clinic has been set up, bringing together the main actors: Human Resources manager, occupational physician, social worker, HSE manager and employee representatives. In the

framework of another agreement on gender professional equality, work-life balance will also be addressed.

Over the coming years, the incorporation of 5 new sites a year into the Group's stress programs is planned.

b. Group standards and medical follow-up

Our policy is:

- To support local medical services in implementing Solvay policies and standards related to health management, and in the use of the Group's health and industrial hygiene information system Medexis;
- To carry out medical monitoring based on individual risk profiles, while respecting the professional ethics and independence of external and internal physicians.

■ Managing Occupational Medicine

→ **Deployment of the Group's health data management systems**

	2013	2016
Sites with system	40	All sites

Perimeter: Solvay group manufacturing perimeter under operational control including joint ventures and discontinued operations.

Group medical standards, procedures, guidelines, and protocols are defined to promote consistent, standardized, reliable best practice in occupational surveillance for each health risk specifically linked to Solvay's activities. Health data are already managed in a structured Group system across 40 sites.

Following several years of development and deployment, the Medexis project aims to provide information and medical protocols to all health teams in order to firmly establish best practice on all Solvay sites. In 2013, major steps were taken towards consolidating the existing tools (Medexis-Health 1, Kistry, Medexis-Hygiene 2) and starting to develop a more advanced Medexis-Health 2. The aim is to develop a data management system encompassing all sites.

■ Assessment of "Solvay Way" practices

In 2013, the "Solvay Way" was deployed to all sites. A number of key practices related to health protection and surveillance have been assessed and scored in this framework, and opportunities for concrete improvement identified. The assessments covered, in particular: the availability of Safety data sheets on all products handled by personnel, the process for hazard identification at the workplace, the assessment of exposure levels, and health assessments and monitoring related to the incurred risks.

Solvay medical protocols

In addition to basic medical protocols, in-house protocols for medical surveillance are developed for chemical substances and other agents that are specific to Solvay activities. These protocols stem from a careful assessment by Group health specialists of chemical substances handled on the Solvay sites, in terms of potential health effects. For selected substances, when appropriate, bio-monitoring requirements are defined. Non-chemical risks also covered by specific medical protocols include: noise, ergonomics, Legionella, video display units, vibrations, forklift driver etc).

Solvay protocols are based on updated scientific information, expert recommendations, regulatory requirements and best practice. They are progressively integrated into the Group information systems to facilitate their use by health teams.

The Medexis Information System: a global approach for physicians and hygienists

Medexis-Hygiene is aimed at managing all occupational exposure data for every worker. Medexis-Health has a similar goal, but for the medical data. Through reliable information and a better evaluation of the occupational hazards and risks experienced by each individual, the main objective of the Medexis projects is to support a uniform and high level prevention of health risks throughout the Group. Access to such information enables high quality risk management and medical follow-up tailored to each employee's situation.

c. Health awareness programs at sites

Our policy is:

- To implement local occupational health programs focused on the improvement of working environments and awareness campaigns on health risks.

→ **Health awareness programs in sites**

Sites with a program	96
On general health: obesity, cardio-vascular risks, tabagism,...	71
On specific risks: musculo-skeletal disorders, hearing losses,...	96
Stress prevention programmes	40

Perimeter: Solvay group manufacturing perimeter under operational control including joint ventures and discontinued operations.

Social

Labor Practices and Decent Work

■ Management of health awareness

In addition to risk control and reduction and to the follow-up of employees health conditions, production sites deploy specific health awareness and prevention programs on an ad-hoc basis. 96 sites have carried out health awareness programs and all sites have programs on health prevention, in particular on occupational hygiene.

Such programs often go beyond employees' health in relation to risks at the workplaces by offering employees the opportunity to improve their general health and wellness. For example, best in class approaches are taken by our Latin America and Iberia sites, with diversified actions including:

- **Periodical medical examinations** by the site physician, with personalized advice on good habits, nutrition, tobacco and alcohol consumption, physical activity and cancer prevention.
- **Promotion of balanced nutrition** to prevent obesity and cardiovascular diseases through involving site canteens in providing and giving prominence to more healthy meals, on-site consultations with nutrition specialists, and monitoring of body mass index.
- **Prevention of cardiovascular diseases** with monitoring of blood cholesterol, triglycerides and glucose, and blood pressure.
- **Anti-smoking campaigns** and specialist advice on stopping tobacco consumption. Informative sessions and measurement of CO in exhaled air.
- **Prevention of cancers** with periodic control of Prostate Specific Antigen to prevent prostate cancer and informative sessions on cancers (breast, cervix, etc).
- **Promotion of general well-being** and prevention of musculoskeletal disorders with gymnastics at workplaces (e.g. U. Textile Santo André, Jacarei, Tavazzano, Massa).
- **Social assistance to prevent psychosocial disorders** (not necessarily work-related).
- **Maternity care** and childcare (e.g. Textile Santo André).
- **Programs for people with addiction issues** (e.g. the Vidua program at Indupa in Santo André).

Italy bets on individuals motivation

Health and hygiene experts in Italy have endeavored to motivate people by capitalizing on their individual interests:

- Offering a different approach to training (easier, more streamlined and more playful): "snack" training sessions.
- Constructing a gym and encouraging philanthropic action with an association that takes care of handicapped persons. It is now possible for workers to gain free access to the gym and to exercise in a very beautiful place; both a gift to workers, and a gift to people with physical disabilities or limitations.
- Cooperating with a physiotherapist to advise employees on how to sit, how to carry loads, how to move correctly.
- Cultivating a partnership between a nutrition expert and a clever cook, to slowly but surely change employee eating habits and help them to make healthier choices.
- Ensuring collaboration and more frequent discussions between family physicians and general practitioners, creating the conditions for a cohort study and- at the same time- making it clear to all the workers that we have no secrets to hide but only health issues to handle in common.

d. Human and organizational factors for safety

Our policy is:

- To deploy behavioral safety programs in line with the Group's standards at all sites;
- To promote best practice and a HSE culture in which all employees share Solvay's commitment towards safety.

→ **Sites with structured safety programs focused on human and organizational factors in line with Group standards (2013)**

	number of sites	% of sites
Sites with program	111	85%
with behaviour observation and safety dialogue	101	78%

Perimeter: Solvay group manufacturing perimeter under operational control including joint ventures and discontinued operations.

■ Integrating human and organizational safety factors in safety

Sites reinforce human and organizational safety factors via a range of programs: "Vigilance", safety culture, zero tolerance, etc. Most of them involve systematic "behavior observation" and "safety dialogues". In addition, the newly-deployed Safety Initiative reinforces the leadership of the GBU management team via site visits and an active personal commitment to accident analysis and corrective measures.

Observation and safety dialogues in the workplace are a cornerstone of Human and Organizational Factors for Safety, aimed at increasing individual risk awareness, compliance with safety rules, and creating opportunities for bottom-up exchanges on these matters.

During the last two years there has, however, been an increase in accidents with irreversible consequences, accidents during cleaning operations, and accidents in operations involving product transfers via flexible hoses. Such accidents will be given particular attention in terms of human and organizational safety factors: increased vigilance, learning lessons etc.

The STOP and Vigilance programs (France)

The actions cover the sphere of Human and Organizational Factors for Safety. These include the "STOP" (Safety in the Workplace through Preventive Observation) program based on the Dupont approach of preventive observations at the workplace. The "Vigilance" program aims to train management in key aspects of safety. This covers behavioral safety, task observation, increasing supervisory and operational staff awareness of safety attitudes and giving operators a better understanding of behavioral factors.

“Safety snacks” continuing in 2013 in Massa (Italy)

This project, at our Massa site, administers short, consistent training sessions during working hours focusing on Hygiene, Health and Safety in a working environment. Instead of two or three eight-hour sessions a few times a year, this training is scheduled once a month. The training session lasts no longer than 20 minutes each time, and acts almost like a coffee break from work.

Talking about safety is ‘doing’ safety. Each training ‘snack’ contains about 5% of the recommended yearly amount, and it is 100% digestible. The goal is to make safety instinctive, in thought and action, as part of everyday habits.

Work at Height – Banksmeadow (Australia)

At Banksmeadow, “Work at Height” (WAH) is defined as any task where a person could fall 2 meters or more. It is designated as a “special activity”, and the HSE Group Procedure requires that for all special activities a separate risk assessment is undertaken of the task, prior to issue of the working permit. The permit also requires a second management signature as part of the approval process. Furthermore, personnel doing WAH and those issuing working permits for tasks involving WAH require nationally-accredited external training. A program of WAH recertification of site personnel is currently in progress and is scheduled for completion by the end of the first quarter of 2014.

e. Management systems for occupational safety

Our policy is:

- All Solvay industrial sites will implement the HSE Management System, in line with Group standards, covering Occupational Health & Safety.

→ **Deployment of safety management systems at sites**

Sites with safety management system	82%
With external certification	54%

Perimeter: Solvay group manufacturing perimeter under operational control including joint ventures and discontinued operations.

Legend: Percentage of sites with in-house SCMS (Responsible care Management System), OHSAS 18001 (Occupational Health and Safety Assessment Series, Responsible care (USA) management systems or VPP management systems).

Deployment of Management Systems for Safety

A number of our sites manage safety aspects using the frameworks provided by OHSAS-type or equivalent management systems. Our other sites rely on an in-house management system (SCMS) that will be progressively extended. On the basis of these systems, the sites seek or maintain external certifications. 54% of the safety management systems are currently certified under various verification schemes.

Solvay sites rely on recognized safety Management Systems

Solvay sites rely on recognized safety management systems, whether Occupational Health & Safety Assessment Series (OHSAS) 18001, Voluntary Protection Programs (VPP) or equivalent, US Responsible Care, or the in-house system, the “Solvay Care Management System” (SCMS). For several years now an in-house HSE Management System (SCMS) has been deployed at many of our sites. Deployment will continue across the entire Group, as this system incorporates all the requirements of ISO 9001, OHSAS 18001 international standards and the main international regulations. Originally established by Rhodia, introduced it over the last 10 years, the SCMS addresses all areas of HSE management is integrated in the Solvay Way sustainability framework. It can be certified under other verification schemes such as ISO 14001, EMAS, and US Responsible Care, according to business and local needs.

The Group HSE Management System is currently being updated

The Group HSE Management System is currently being updated. In 2014 a small number of sites will be audited by Corporate teams, based on this redefined reference system, by an internal team. An external certification body will also conduct a number of audits to verify the compatibility of this revised Solvay Care Management System with the integrated ISO 9001, ISO 14001 and OHSAS 18001 certification across 6 sites of selected Business Units. All sites will then have to progressively implement the updated system, building on their existing management system(s).

Example of a recent certification, India

In 2012, the Panoli plant (India) was successfully granted OHSAS 18001 certification, with the final audit carried out by Bureau Veritas. This audit was integrated within the plant’s Quality Management System and Environmental Management System. The two non-conformities were solved within 90 days. Between 2008 and 2012, the safety records of the Panoli site were excellent with LTARs of zero, except in 2009 (LTAR 0.8). The 2012 MTAR was 0.6.

Social

Labor Practices and Decent Work

f. Process Safety

Solvay operates 74 sites classified as major risk installations. Process Safety is an essential and enduring element of the Group's sustainability, in terms of protection of people and the environment, and of business continuity.

Process Safety is a framework for ensuring the integrity of operating systems and processes by applying good design principles alongside best engineering and operating practice. It deals with the prevention and control of incidents that have the potential to release hazardous materials or energy into the environment. Such incidents can have toxic effects, or cause fire or explosions, and could ultimately result in serious injuries, property damage, production losses, and a negative impact on the environment. Solvay gives much attention to intrinsic safety when designing installations.

Our policy is:

- To perform consistent hazard identification and risk analysis for existing, new or modified installations using methods and procedures in line with Group standards;
- To implement the Process Safety Management system at sites, according to the risks of their processes, and to cover all local requirements.

Solvay's 2020 target:

➔ For 100% of our sites to have a risk analysis for every production line updated in the last five years.

➔ Main process safety - levels H and C

	2012	2013
level H	0	4
level C	1	0

Perimeter: Solvay group manufacturing perimeter under operational control.

Legend: levels C and H refer to Solvay's classification of process safety incidents. Solvay uses a 4 level scale: L = Low, M = Medium, H = High (because of "reversible effect on physical integrity off site", capital losses, ...): C = Catastrophic

Management approach in Process Safety

Process Safety Management (PSM) introduces key safety elements, especially at sites involving major risks, with these systems set up to comply with major risk regulations, like the Seveso Regulation. Solvay has 74 sites with ad hoc safety management systems in the framework of major risk regulations. All sites have implemented PSM systems.

In addition to this the Group has developed an in-house process safety management system, fully compliant with PSM regulations (particularly US regulations). Three PSM levels have been defined, based on international standards and in-house expertise, which will determine the level of safety requirements to be deployed, corresponding to the risk level of each site.

In 2013, 4 serious accidents (level H, see Legend) took place. Following investigations corrective actions have been taken to all sites:

- Collonges, France: Hot air was released from a bellows, with no effects on human health or the environment.
- Blanes, France: Leaking of HexaMethyleneDiamine 90%, contained in the retention bund of the storage tank.
- Clamecy, France: Leak of 200m³ of 10% nitric acid solution, collected in a pit. A small amount was released into a nearby watercourse off-site.
- (Dominguez, USA) During start-up, a significant release of SO₂ occurred, which affected around 70 people with reversible pulmonary effects.

Solving Risk Level 1 Situations

A key element of Solvay's new improvement program in Process Safety is the handling of "Risk Level 1" situations, with every production line concerned requiring reassessment every five years. 58% of sites are already in line with this requirement.

Whenever an installation incurs a risk, the risk scenario must be characterized using the Group's standardized matrix (Levels 1, 2, 3).

➔ Solving Risk Level 1 situations



	end 2012	end 2013
Number of remaining risk level 1 situations	111	11

Perimeter: All manufacturing installations under operational perimeter. The consolidated data cover 85 sites over the total of 144 operational sites (including joint ventures and discontinued operations).

Legend: number of remaining Risk Level 1 situations under 1 year old. A level 1 Risk is the highest level of residual risk identified for a scenario during risk assessments according to the matrix of risk acceptability in Process Safety within the Solvay group.

There were 111 "Risk Level 1" situations at the end of 2012, all solved in 2013, with only 11 new ones one year later. All Risk Level 1 situations must be handled and resolved within 12 months. Around 15-20 new cases arise every year in the normal course of process development, excluding situations in acquired activities.

PSM is deployed by sites with the support of corporate Health, Safety & Environment management. In all high risk sites, the external risk engineers of the insurer FM Global play a key role in risk identification and produce recommendations on further risk reduction measures. Recommendations by FM Global are analyzed at Group level to define and implement additional guidelines across concerned sites.

The focus in 2014 will be on the "Fire Protection-Inspection Programs" and "Hot Work Permits".

Emergency preparedness and public information plans are in place. Exercises and crisis simulations are held periodically to check on and improve emergency preparedness. Global international alert procedures are in place at Group level to manage emergency responses.

G4-LA6

Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender

The accident frequency rates for employees and contractors and recognized occupational diseases, are the main indicators followed at Group level. Detailed reporting and analysis by Business Units and by individual sites are carried out. Gender and absenteeism are not assessed as a determining factor in the framework of the HSE management.

■ People accidents at sites

Our policy is:

- To move towards zero occupational accidents by promoting best practice and a HSE culture in which all employees share Solvay's commitment towards safety.

Solvay's 2020 target:

- ➔ Less than one occupational accident with medical treatment per million working hours.



→ People accidents at Group' sites



Accident frequency rates	2009	2010	2011	2012	2013
LTAR employees and contractors	1.6	1.6	0.8	0.8	0.81
LTAR employees	1.6	1.3	0.8	0.8	0.72
MTAR employees and contractors	5.1	4.8	2.9	2.59	1.06

Perimeter: Solvay Group perimeter (i.e administrative, research, manufacturing and discontinued operations sites) under operational control (i.e defined on a case by case basis in the frame of joint venture agreement). This represent 197 sites.

Legend: MTAR (Medical Treatment Accident Rate): number of work accidents leading to medical treatment other than first aid / million working hours.

LTAR (Lost Time Accident Rate): number of work accidents with lost time (away from work) more than 1 day / million working hours.

□ Management of people occupational safety at group sites

-Safety results show a steady improvement of MTAR in 2013, in continuity with previous years' progress, reaching a record value of 1.1, compared to 2.6 at the end of 2012. The Group's safety target focuses on MTAR because it reflects the severity of accidents, with work days lost following accidents measured by the LTAR figure. Accidents with lost time per million working hours (LTAR) reached 0.8 for the Group's employees and contractors in 2013. By comparison, the average LTAR for the EU chemical industry is currently around 6. The safety performance is presented monthly to the Executive Committee.

The Group aims to achieve the highest safety level for Solvay's personnel, but also equally for contractors working on Solvay sites. One of the drivers of the progress recorded in the past few years has been the Group's programs addressing "Human and Organizational Safety Factors", in particular behavioral safety and safety leadership by management. Particular attention will be devoted to the reinforcement of basic rules (such as the wearing of personal protective equipment, work permits, work at height permits).

For more details on human and organizational safety factors, the reader is referred on pages 80-81.

□ The Safety Leadership Practices Initiative

- In 2012, the Comex launched the "Safety Initiative", which relies on best Management leadership practice, with a focus on Management visibility and involvement. The initiative also sets new quantified targets for MTAR, for Chemicals Contact Accidents, and for Irreversible Accidents:
- MTAR <1 by the end of 2014;
 - To reduce the number of irreversible accidents by 30% by the end of 2014;
 - To reduce the number of accidents with chemical contact by 30% by the end of 2014.

The key practices in Safety Leadership are:

- Business managers visit the site for each irreversible accident; to review the circumstances of the accident and the corrective action being taken;
- Business or Function Manager Management Team member performs four safety visits per year to all sites within his/her perimeter. Each Comex member also does the same within the Group;
- The Top Management (CEO, Comex Supervisor, GBU Managers) are informed of each Lost Time Accident (LTAR) within 24 hours;
- Sites provide analysis of each irreversible accident and each accident with chemical contact, after which they organize a Group Lesson Learning Event; thereby reinforcing the process and increasing awareness to avoid reoccurrence of similar events;
- GBUs exhibiting unsatisfactory performance present an action plan to the Comex.

■ Fatal accidents

→ Fatalities on site related to occupational activities - employees and contractors



	2011	2012	2013
Number of fatal accidents	1	0	2

Perimeter: Solvay Group perimeter (i.e administrative, research, manufacturing and discontinued operations sites) under operational control (i.e defined on a case by case basis in the frame of joint venture agreement). This represent 197 sites.

Legend: Number of fatalities on site related to occupational activities - employees and contractors.

Social

Labor Practices and Decent Work

□ Prevention of fatalities

A fatality is by essence the worst and most unacceptable accidental situation. 2 fatal accidents occurred in 2013. Detailed analysis of these accidents has of course been carried out and corrective actions taken.

The prevention of fatal accidents, and more generally of any occupational accident, is central in Solvay's HSE Management- which covers all aspects of HSE and requires that each operational entity of the Group introduce systems to manage these domains. A detailed analysis is made and corrective actions are taken when appropriate.

The new "Safety Initiative" and all actions aimed at reinforcing safety culture contribute to the avoidance of fatal accidents.

■ Monitoring and preventing occupational diseases

Our policy is:

- To prevent occupational diseases and disability through a high level of risk management and control;
- The emergence of occupational diseases reflects the health conditions of the overall employee population. Their reporting and careful analysis form the basis of better protection for employees in the future; developing awareness programs and dedicating more in-depth attention to occupational hygiene conditions.

□ Monitoring and prevention of occupational diseases

Variations in the systems and criteria for disease recognition, between countries and regions, significantly influences the number of reported cases. Today most reported cases come from European countries, particularly France.

Carcinogenic diseases related to past exposure to asbestos are showing a downward trend, while benign asbestos-related diseases, after halving in 2009, have been stable for the last 4 years. Hearing disorders have been significantly reduced over the past few years. Other types of recognized diseases are currently stable over time.

Most reported diseases find their origin in exposures that took place in the past, in particular asbestos diseases and cancers. A dedicated program has been underway for many years to prevent this type of exposure.

For each observed health problem that could be of occupational origin, an investigation looks at the working conditions and the characteristics of the person affected, leading to corrective measures and further improvement of working conditions and occupational hygiene, as well as a reinforcement of medical surveillance for the detection of early effects.

With regard to health surveillance, the Group aims to further unify and share the medical surveillance protocols worldwide, in order to ensure equivalent medical follow-up and early detection of occupational diseases across all the Group's sites. This is made possible via the health module of the Medexis Information management systems.

For more details on health management, the reader is referred to pages 79-81.

Limitations of the reporting

Reporting on occupational diseases (OD) is very important for the management of occupational health. Recorded and formally recognized cases trigger further investigations into the working conditions and characteristics of the person(s) affected, and could possibly lead to decisions regarding corrective measures.

The number of occupational diseases recognized by health authorities is based on information provided by the local occupational physicians, by the health and human resource services, and depends on country-specific provisions for such registration. Recognition is subordinated to local regulations and systems, and to the existence of various compensation systems. Underestimation of the number of recognized cases may happen because the employer is not systematically informed.

→ Recognized Occupational Diseases (2013)

	Asbestos benign in pathologies	Hearing disorders	Musculo-skeletall disorders	Other non-carcinogenic diseases	Asbestos cancers	Other carcinogenic diseases	Total
Europe	14	1	1	2	8	2	28
North America	0	0	0	0	0	0	0
Latin America	0	0	2	0	0	0	2
Asia South Pacific	0	0	0	0	0	0	0
Total	14	1	3	2	8	2	30

Perimeter: Solvay group manufacturing perimeter under operational control.

Legend: An occupational disease is any disease contracted as a result of exposure to risk factors arising from work activity (ILO). A 'Recognized Occupational Disease' refers to an official decision given by local authorities, as a result of a formal recognition (and compensation) demand. Recognized Occupational Diseases are reported within the year of recognition. Recognized ODs, the financial consequences of which are not carried by Solvay, are also included in the reporting.

Management of asbestos materials

Solvay sites have undertaken and continue to undertake many efforts to remove remaining asbestos materials, under long-term plans to eliminate wherever possible any remaining asbestos-containing material, even in the absence of exposure. Asbestos has been used in the past in Solvay plants, as in many other industrial activities, for insulation of equipment and buildings, protection against fire, gaskets, building materials etc. It has also been utilized in some chlorine electrolysis plants – as the "diaphragm cell"- and for a period as filler in some flooring or plastic phenolic resins.

G4-LA7 Workers with high incidence or high risk of diseases related to their occupation

Solvay manages risks for health at the workplace in terms of "jobs" (tasks) or exposure groups. The key management indicators for Solvay is the deployment of exposure assessments that are carried out in line with Group requirements. These assessments are aimed at checking compliance with industrial hygiene standards and identify workstations where acceptable exposure limits might be exceeded.

Solvay handles and transforms thousands of chemical substances in its operations. Personnel are potentially exposed to a wide range of hazardous agents. Industrial Hygiene consists of anticipating, recognizing, evaluating and controlling potential health risks (chemical, physical and biological agents, and ergonomics) in the working environment.

Reliable and extensive assessments of workstations are paramount to a coordinated approach to protecting health, in addition to adequate corrective measures and protective equipment when necessary. Industrial hygiene is an essential and enduring element of the Group's sustainability, in terms of efficient work environment, employee morale, protection of neighbors and business continuity. The commitment to industrial hygiene is driven by the assumption that a healthy and productive workplace is a major key to long-term sustainability.

Solvay is deeply committed to complying with all applicable laws and regulations related to industrial hygiene, and to defining and deploying - when relevant - voluntary commitments that go beyond applicable laws and regulations.

■ Assessment of workstations for exposure to health risks

Hygiene risk assessments using Group-validated methodologies and corrective measures.

Our policy is:

- To prevent adverse impact on the health and well-being of every employee, temporary worker, contractor and visitor;
- To maintain an open dialogue concerning Solvay's industrial hygiene with its employees and contractors.

→ **Jobs / exposure groups with exposure assessments in line with Group requirements in the last 5 years**

Number of jobs/exposure groups assessed	15 029
Total number of jobs/exposure groups targeted	20 287
Progress to target	74%

Perimeter: Solvay groupe manufacturing perimeter under operational control including joint ventures and discontinued operations.

Legend: Assessments are counted when they are validated by Corporate Industrial Hygienist Risk assessments are based on atmosphere measurements or evaluations, and cover exposures to airborne chemicals.

□ Assessment of workstations

The emphasis has been placed in the past few years on standardizing the assessments of working conditions using Group-validated methodologies. The objective is to have reassessments at least once every 5 years for each job or exposure group. By end-2013, this periodicity had been attained for 74% of jobs or exposure groups.

In 2013 a total of 199 Priority 1 ("P1") assessments were especially targeted, with corrective actions defined for all of them. For the most significant risks, awareness campaigns and visible displays explaining the risks and ways to reduce them must be introduced. Results of the assessments are available to the personnel.

CMR (Carcinogenic, Mutagenic, Reprotoxic) substances on the radar of the SVHC Committee

The newly-appointed dedicated Solvay advisory team for Substances of Very High Concern will ensure a coordinated follow-up of all "SVHCs". The team proactively advises business entities in order to ensure a sustainable management of these substances, within 3 areas of responsibility: Occupational Hygiene, Product Stewardship and Environmental Releases by Solvay plants.

Program success in 2013, controlling exposure to 1.2 Dichloroethane in Thailand.

This 3-year program was triggered by a new Solvay Acceptable Exposure Limit (SAEL), set above legal requirements at 1 ppm, with the aim of improving protection of the personnel at the Vinythai site against this substance, classified as a CMR. Between 2011 and 2013, hygiene conditions of all concerned functions were improved. Airborne concentrations are now better controlled for process field operators, day operators and maintenance operators, and have decreased by a factor of 20. Technical improvements were particularly effective, with the connection of all sampling points to a "closed system" (as well as the main drain points), upgrading of the main pumps to "seal-less pumps", and the continuous air monitoring of workplaces with 28 sampling points operational by the end of 2013.

Local exhaust ventilation awareness

Local ventilation systems are an important element of exposure control strategies as many of our employees work closely with hazardous substances such as dusts, aerosols, and vapors. In 2013, a highly instructive document entitled "Local Exhaust Ventilation Awareness" was addressed to the frontline management of our plants worldwide, with clear guidelines such as:

- Each ventilation system should be checked at least annually.
- Each inspection should be documented and auditable in the HSE Management System.
- In the early stages of any modification project, local exhaust ventilation must be preferred over general or room ventilation.

Industrial hygiene standards

Our policy is:

- To define and apply Occupational Exposure Limits worldwide;
- To identify Substances of Very High Concern used and update the relevant risk studies.

□ Solvay Acceptable Exposure Limits (SAELs)

The system of OELs (Occupational Exposure Limits) and SAELs (Solvay Acceptable Exposure Limits) is widely deployed throughout the Group. OELs have been used for a long time as references to assess, control, and limit workplace exposures to hazardous agents with the aim of protecting workers from adverse health effects. In cases where OELs defined by authorities are not available, Solvay has for a long time had its own process to establish its own internal limits, the "Solvay Acceptable Exposure Limits" (SAELs).

Such SAELs may also be used worldwide in Solvay plants where official OELs differ between countries or regions, which would lead to different levels of protection for workers across different borders.

SAELs are used in the determination and validation of adequate risk management measures during facility design, process engineering, and the definition of ventilation systems and operational control systems.

□ Medexis: sharing industrial hygiene standards worldwide

Solvay's information system(s) for Medexis-Hygiene aims to offer easy access to all standards, risk assessment results, data, risk profiles and Group procedures. It is progressively deployed across the Group's sites. Step 1 of Medexis-Hygiene 1 is now complete, with 50% of sites equipped with the system.

The second phase of the project now aims to institute a redefined Medexis-Hygiene 2 system across sites, taking into account the lessons learnt with Medexis-Hygiene 1 and the increasing needs of users (industrial hygienists, site managers, and occupational physicians).

The overall aim of this long-term project is to deliver harmonized processes and tools with which to identify and assess all risks for workers, to follow and trace individual exposure according to local regulations, and to define and deploy industrial hygiene control measures worldwide. Shopfloor management, using the Solvay People Management model, will be central to the target of improving pro-activity in risk management.

The Medexis-Hygiene 2 project will include two steps: the Industrial Hygiene element (described here) and the Occupational Health element (a study is currently under way to confirm the scope of this project).

G4-LA8

Health and safety topics covered in formal agreements with trade unions

Health and Safety is an integral part of the agreement recently signed with IndustriALL. For more details on IndustriALL agreement, the reader is referred to page 92.

Training and Education

G4-LA9

Average hours of training per year, per employee, by gender and by employee category

Solvay's 2020 targets:

- 1 week of training per employee and per year
- Training of 100% of our employees to the Solvay Way reference framework

The following section reports on the training delivered to the Group's employees (including discontinued Solvay operations without Joint Venture). Training hours are recorded per employee, by gender and employee category, as well as training investment per person (see boxes).

During 2013 Solvay focused its training activities on a number of key areas, resulting in an overall increase in the average number of training hours per individual.

In 2013, Solvay fully implemented the zone learning framework, with key learning activities now available locally in all six of the Group's zones. This educational framework ensured that local needs were met at the same time as supporting large scale Group initiatives, which enabled the Group to bring a global perspective to some key areas:

- Deployment of the Group's new Management and People Models. The Management Model focuses on how Solvay directs its business and the People Model represents the "deal" between Solvay and its employees. In other words, what Solvay expects from its employees and in turn what employees can expect of Solvay. "Bridge" workshops have been developed to fully cascade this program with interactive exercises, delivered in 11 languages worldwide. Launched in 2013, it will continue to be rolled out in 2014.
- Implementation of the PDCR (Performance, Development and Career Review) which is a new aligned performance management tool. Close to 15 000 hours have been devoted to ensuring that managers are sufficiently skilled at delivering and utilizing this new tool.



Overall we saw an increase in the average number of learning hours per year to 36.2 per employee.

This represents a 2.5% increase over the previous year, a figure largely accomplished through the continued and increased use of internal faculty.

62.3% of the training delivered in 2013 was by our internal faculty. This is a significant year-over-year increase from 2012, when only 48.8% of the Group's programs were delivered by colleagues and the balance by external partners. Solvay believes this is an important trend and will continue to support this activity in 2014 by implementing a program to develop the skills of the Group's internal faculty, enabling employees to have as much educational impact as possible within their respective subject areas.

Solvay observed a shift from previous years, in that the average number of training hours was higher for manager than non manager categories. The two large initiatives mentioned above, "Bridge" workshops and PDCR Training, played a key role in this result.

The average number of training hours per manager was 39.7 per year, while the average number of training hours per non manager was 35.3.

An increased focus on data collection, and an enhanced process for doing so, enable Solvay to report on training delivery by gender with more accuracy.

Men, who represent 80.2% of the Group's workforce, received 82.1% of the training delivered, while women who represent 19.8% of the total workforce received 17.9% of the training.

This resulted in an average number of learning hours per year for men of 37.3 and 32.7 for women.

The Solvay group delivered 1.1 million hours of training in 2013.

Overall, the Group invested €8.8 million in training, which represents an average of about €288 per employee worldwide.

G4-LA10

Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings

Programs to support employability and career management are embedded into Solvay's larger personal development approach.

■ Fostering a culture of personal development

Solvay is committed to endorsing the personal development of its employees. It will empower each employee to grow and to develop his or her career by fostering a development culture and providing policies, tools and appropriate actions to achieve this. The target is to enable every employee to maximize his or her potential for performance and increase their employability.

The culture of development envisioned is characterized by challenge, feedback and benevolence. It is an integrated part of the Solvay People and Management Models that have been widely incorporated throughout the Group in 2013 via the "Bridge" workshops delivered to 4 000 employees.

Social

Labor Practices and Decent Work

The Performance and Development Policy envisages an annual review meeting between manager and employee which gives feedback on the previous year's attainment of agreed objectives, on general performance as compared to the responsibilities described in the job family job description, and on technical skills, behavioral competencies, and strengths demonstrated. Where necessary, areas for further development are highlighted.

Based on such holistic analysis an individual development plan is prepared. It defines actions to be taken, which may include training on the job, learning activities (see above G4-LA9), coaching/mentoring and internal mobility (see above G4-10).

■ Performance, Development and Career Review (PDCR)

Solvay recognizes the performance rendered by each employee and fosters their development.

To help managers to achieve the best results in enhancing performance, and in the development of their staff, a new tool and process has been developed and implemented in 2013; the Performance, Development and Career Review (PDCR). This process covers all entities of the group. It is based on, and merges the approaches of, those previously applied in the Rhodia and Solvay legacies of the group.

The process is supported by an electronic tool, integrated with other processes like Compensation and Learning and Talent Management, ensuring the relevance of the performance results.

Overall work performance is evaluated, feedback is given to the employee and in this way a continuous process of performance improvement is implemented.

However, the main focus of this new tool and process is on development:

- Particular attention is given to assessing the behavioral competencies of the employee;
- The process envisages that manager and employee will agree on a development plan;
- The development plan will be fixed, reviewed and evaluated at defined moments during the subsequent year;
- Third party feedback is viewable in the tool. First indications show that this feature has been well-received by the workforce.

Development plans are also being formalized for a similar system for the Group's Senior Executives. The results will be used in the 2013/2014 Compensation Review.

The Executive population (about 450 employees) is covered by individual development plans in 2013.

Beyond its initial scope the PDCR is also used by about 1 500 non manager employees. Further extension of the system is possible but requires the willingness of both local management and personnel.

For the population not yet covered by the PDCR, local performance and development tools and processes exist. ISO quality certification requires such management and the majority of Solvay's plants are covered. Approximately 70% of Solvay non-managerial staff are covered by skill management in compliance with ISO. The long-term goal is to cover 100% of personnel worldwide.

By utilizing these performance and development approaches Solvay ensures that management attention is given to regularly recognizing performance and to developing the potential of employees. These approaches are also expected to:

- improve dialogue between manager and employee;
- foster the achievement of the Group's objectives;
- increase the engagement and employability of our Human Capital;

and therefore enhance sustainability in the field of human resource management.

■ People Perception and Engagement

The Solvay legacy for many years carried out a "Solvay People Survey" every two or three years in order to evaluate the satisfaction and engagement of its personnel and to derive action for improvement. The results of the last survey, which took place in 2011, showed engagement at a level of 72% of positive responses to relevant questions; a little lower than in 2009.

The next survey, encompassing all Solvay personnel and including those of the Rhodia legacy, is planned for 2015, with the integration process then complete.

G4-LA11 Percentage of employees receiving regular performance and career development reviews, by gender and by employee category

Rolled out in December 2013, the PDCR applies to the entire manager workforce.

The Management population (about 7 000 persons) covered by the PDCR was 99% in 2013.

Diversity and Equal Opportunity

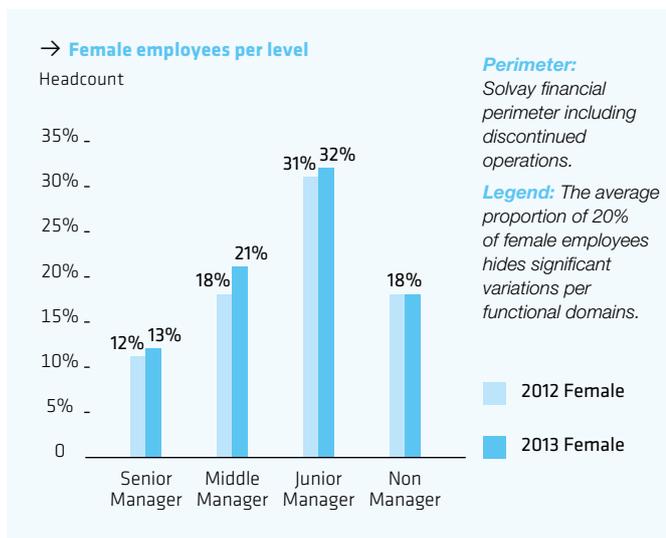
In its Code of Conduct, Solvay commits to equal opportunity and encourages diversity at every level of employment. The Group aspires to be a truly diverse group in terms of age, gender, nationality and culture. Valuing diversity means creating a workplace that respects and includes differences, recognizing the unique contributions that individuals with many types of differences can make, and creating a work environment that maximizes the potential of all employees.

The Group's Human Resources policies explicitly require diversity to be encouraged, so as to strengthen the multinational, multicultural and multidisciplinary composition of the Group's population. They also require that equal opportunity in employment is observed and outlaw discrimination of any kind.

A series of indicators are monitored in relation to diversity, including international postings, gender diversity, fairness in compensation and pay, and equality in promotion.

G4-LA12 Indicators of diversity

■ Gender diversity



→ Female employees per level

	2012		2013	
	Female	Male	Female	Male
Senior Manager	12%	88%	13%	87%
Middle Manager	18%	82%	21%	79%
Junior Manager	31%	69%	32%	68%
Non Manager	18%	82%	18%	82%
Total	20%	80%	20%	80%

Perimeter: Solvay financial perimeter including discontinued operations.

Legend: The average proportion of 20% of female employees hides significant variations per functional domains.

Female employees are appointed to 27% of managerial positions. At the Executive Level, the percentage is 13%. A slight rise in percentage can be observed at middle management level (21% from 18%).

In Functions (Human Resources, Finance, Communication, Innovation Center, Research & Technology, SBS), female workers represent about half of the total headcount; whereas the percentage of women in production – by far the largest part of our workforce – remains low.

The willingness to strengthen gender balance at all levels is expressed by the following:

- The International Management Seminar (IMS) organized for high potentials includes a sequence on Inclusive Management to raise awareness and prepare managers to promote diversity and manage diversely composed teams;
- This issue is a top priority point on the HR Management team agenda;
- In 2013 a large number of country-specific commitments were entered into (e.g. Convention Mixité in France);
- An awareness workshop on staffing envisaged for 2014 will address diversity as a specific issue;
- The Solvay Way requires that every site address and manage diversity and equal opportunity.

As an example of how other diversity issues are addressed:

- a preliminary 'generation contract' agreement signed in France between Solvay and trade unions, commits Solvay, between 2013 and 2015, to (amongst other things) increase the number of young hires on permanent contracts and, with respect to the retention of seniors, to ensure that at least 13% of the workforce is aged 57 years and older.

■ Equal Opportunity and Equal Compensation

The Group is willing to ensure equality in grade and pay as experience and studies reveal that inequity may generate demotivation and jeopardize commitment.

To ensure equity in the career ladder the Solvay job classification system is based on a single method (Hay), applied to all jobs. This method is also used by many other organizations. The method looks at job characteristics only, and the same criteria apply to all types of jobs, regardless of whether they are predominantly held by women (e.g. communication) or by men (e.g. production). Thus the grade of the job does not depend on gender or any other individual attributes of the person.

As all management jobs worldwide are graded according to this system, the grading of the person generally follows the job grade.

For more details, the reader is referred to pages 74-76.

Equal Remuneration for Women and Men

G4-LA13

Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation

The Group's compensation policy for managerial personnel provides a corridor around the given grade's reference salary midpoint to ensure salary equality amongst employees within the Company, and also competitiveness and fairness vis-a-vis the external work market.

The reference salary is defined per grade (see above). The average ratios per grade are similar for men and women in the workforce.

The remuneration of non-managerial personnel follows local standards and collective bargaining agreements.

Assessment of Labor Practices

G4-LA14

Percentage of new suppliers that were screened using labor practices criteria

Solvay did not report this indicator. However, Solvay participates in the "Together for Sustainability" initiative which takes into account the assessment of our suppliers for labor practices.

For more details on Together for Sustainability Initiative, the reader is referred to page 93.

Ethics and Integrity

Organizational values, principles, standards and norms of behavior (G4-56)

The Solvay Code of Conduct sets out how Solvay wishes to carry out its business and how it wishes to interact with all its stakeholders in an ethical and lawful manner. It is based on a strong tradition of values that are historically ingrained in the Group's culture. This Code applies to every Solvay employee wherever Solvay operates or conducts its business.

The Solvay Code of Conduct provides general guidance to all employees; it is not an exhaustive document anticipating every situation employees may face in their day-to-day business. Rather, the Code highlights the guiding principles that form the basis of the Group's policies.

To obtain the widest possible involvement of all employees in implementing the Code, the Group will continue to promote a rich and balanced social dialogue between senior management and social partners.

The Solvay group takes various measures to ensure that the Code is applied, including targeted training programs, in order to minimize the danger of violation, and there are provisions for clear sanctions where necessary.

Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity such as helplines or advices lines (G4-57)

The Legal and Compliance function contributes to or enhances the compliance culture. It acts under the authority of the Group General Counsel. The Ethics and Compliance department has the more specific objective of strengthening a culture based on ethics and on compliance with the Solvay Values and Code of Conduct. Compliance Officers have been appointed in all four geographic zones where the Group is active. These are assisted by a network of experienced employees tasked, in addition to their other responsibilities, with supporting activities in this area.

Solvay relies on its employees to support this Code of Conduct in every way. The Group cannot address questions or concerns unless it is aware of them. Employees who need clarification about the application of the Code of Conduct, who know of an ethical or compliance issue, or who believe in good faith that non-compliance issues are occurring at Solvay are encouraged to come forward.

Internal and external mechanisms for reporting concern about unethical and unlawful behavior, and matters related to organizational integrity, such as escalation through line management, whistleblowing mechanisms or hotlines (G4-58)

The first and best place for employees to Speak Up is with their individual manager or supervisor. Indeed, part of the manager/supervisor's job is to listen to employees, understand their questions and concerns and act on them appropriately. In addition, employees may seek help from any other manager or supervisor; they may turn to a member of the local or regional HR, Legal Department, Internal Audit or the Compliance Officers.

As an alternative, employees may wish to use the Ethics Helpline, maintained by a private third party and operated in accordance with local law.

All reports will be investigated and all investigations will be conducted in a manner that reflects Solvay's values, its respect for the rights of all parties involved and applicable law.

In no event shall an employee who makes a report be subject to retaliation. Any person, regardless of position, who engages in retaliatory behavior will be subject to disciplinary action. Provided that reports are made in good faith, no action will be taken against an employee raising a concern that eventually proves to be inaccurate. Abusive accusations will not be tolerated.

HUMAN RIGHTS

Respecting Human Rights is one of the key principles of the Solvay Code of Conduct. This principle is supported by a specific policy on Human Rights.

The Group has made a formal commitment to respect the international labor standards defined by International Labor Organization (ILO) conventions and the principles of the UN Global Compact. In 2013,

the Group signed a worldwide social responsibility agreement with IndustriALL Global Union. This agreement shows Solvay's determination to underscore its human rights commitment and to ensure that the Group's social standards in the areas of health, safety and environmental protection are respected on all its sites all over the world. This agreement applies to all Solvay employees.

Freedom of association and collective bargaining

The Group commits to respect employees' fundamental human rights and to guarantee their social rights. These include the freedom of association and collective bargaining, including the decision whether or not to form trade unions. Both elements are considered basic requirements for maintaining the necessary acceptance by employees and by society at large in order to deploy our activities.

Beyond these commitments the Group strives to maintain trusting and constructive relations with its employees and their representatives. An essential basis for such relation is regular dialogue with employee representatives, when it exists, and their organizations.

Such proactive dialogue is based on the conviction that together everyone can better be prepared for economic, social and organizational changes. It also fosters the commitment of our employees - a crucial prerequisite for the high degree of productivity that is necessary to sustainably and successfully develop our activities.

■ Actions taken and foreseen

The level of dialogue achieved by the Group is good, even at times innovative. However, we strive to improve even further the level of our social dialogue, as we consider the relationship with our employee representatives to be crucial for our future development and for our acceptance in society at large.

European Worker's Council (EWC):

A permanent dialogue on sustainability issues has been established for years between Solvay and its European Works Council (EWC). In 2013, the EWC met in plenary session 4 times and the EWC Secretariat met 11 times with senior Group management, allowing these representative bodies to be part of the evolution of the Group.

On December 17 2013, Solvay signed a CSR agreement with IndustriALL (an international global trade union federation created in 2012 out of three trade union federations in metallurgy, textile/garments/leatherworking, and chemicals/energy/mining (ICEM) and representing over 50 million workers in 140 countries). This extended a pre-existing agreement between Rhodia and ICEM, with minor modifications, to the whole Solvay group.

This agreement enforces Solvay's commitment to respect the ILO standards and the principles of the UN Global Compact. Each year, two assessments, among one on safety issues, are carried out by IndustriALL representatives out on a site to monitor correct application of the commitments at a grassroots level. In the Rhodia legacy perimeter, these assessments have already been completed in China, Brazil, the US and Korea. An annual review was presented to an multi-national body representing the Group's employees (European Works Council).

IndustriALL agreement will be implemented in 2014.

Employee representation Indicator

Trade unions are present at the majority of Solvay sites around the world. For the Group, union membership is estimated at 20% in Europe, 30% in South America, 10% in North America and 30% in Asia.

Collective agreements are normally extended to all employees even if non members of a union. Thus coverage by collective agreement amounts to 85% worldwide.

These data indicate that freedom of association is ensured within the group and that its practical application provides mutually agreed conditions of work to our employees.

G4-HR4 Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and measures taken to support these rights.

With the new IndustriALL Agreement, Solvay commits to respect international social standards as defined by the International Labor Organization and enforces its commitment to comply with the principles of the United Nations Global Compact in all of its operations worldwide, also in countries which have not yet ratified these conventions. Solvay expects its suppliers and sub-contractors to respect these fundamental principles. This IndustriALL Agreement is challenging for all Solvay sites.

Every year, two joint assessment missions will be conducted in a country and on sites chosen by IndustriALL, along with IndustriALL officers, Solvay management and trade union representatives. This assessment will focus on health, safety and environmental protection, pay levels, training policy, the quality of social dialogue, relationships with suppliers and subcontractors, combating discrimination, and the promotion of equal opportunities.

Supplier human rights assessment

Supplier human right assessment is part of a broader sustainability approach. Sustainability is an integral part of the Solvay group strategy. As a source of long-term value, this dimension has been integrated into the Group's Purchasing Policy.

- To ensure that suppliers meet defined sustainability criteria, the Solvay Way Corporate Social Responsibility (CSR) framework is integrated into the Solvay Purchasing Process (SPP).
- To guarantee that sustainability criteria are met, CSR audits and assessments are conducted using selected external service providers specialized in these fields.

The Group activities follow a certified global process ISO 9001 aligned with the Solvay Way towards suppliers. The Group requires employees to act in accordance with the highest ethical and legal standards in doing business, and works with suppliers who are committed to the same principles of sustainability and ethical behavior.

The CSR dimension is evaluated by questionnaires and/or audits developed specifically for the purchasing areas (e.g raw material, packaging, logistics), and covering Management, Environment, Health & Safety, Labour & Human Rights, Governance.

During the 12-month pilot phase ending in June 2013, TfS members together initiated close to 2 000 assessments and audits. While the assessment was worldwide, the audits during this first phase concentrated on raw materials suppliers in China. The scope will be widened in the next TfS phases to additional sourcing markets and purchasing categories.

The objective for Solvay for next year is to run more than 300 CSR assessment and audits, conducted via EcoVadis or via pre-selected, independent, third-party audit companies.

To learn more about the initiative, please visit: www.tfs-initiative.com and about EcoVadis: www.ecovadis.com.

G4-HR10 Percentage of new suppliers that were screened using human rights criteria

■ Together for Sustainability Initiative

In 2011, a novel initiative, named "Together for Sustainability" (TfS), was launched by six major chemical companies (eight since 2013) including Solvay, to share supplier audits and assessments.

The approach consists of using:

- a best-in-class external service provider EcoVadis which "operates the first collaborative platform, enabling companies to monitor the Sustainability performance of their suppliers, across 150 sectors and 95 countries" and which performs sustainability assessments on the basis of a predefined TfS questionnaire, and
- pre-qualified audit companies which undertake standardized physical site audits on the basis of an audit and guidance template developed by TfS. Audits and assessments are done on behalf of the different member companies.

The purpose of the TfS initiative is to develop and implement a global audit program to assess and improve sustainability practices within the supply chains of the chemical industry. Sustainability here includes health & safety and labor as well as environmental issues, as criteria that are taken into consideration for doing business with a supplier. TfS members raise awareness among suppliers in order to continuously improve sustainability standards in their supply chains. For compliance and strategic reasons, each individual TfS member company remains completely responsible in selecting suppliers to undergo an assessment or audit.

Solvay has been implementing the TfS approach since 2012. During the pilot phase (July 2012 to June 2013) it ran more than 200 assessment and audits targeting mainly raw materials suppliers in China and major suppliers in all other domains in all countries.

SOCIETY

Local communities

The Group's policy on philanthropy specifically encourages initiatives at local level to support the 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 for local young people, and reducing the social consequences of site closures, openings, and restructurings.

At corporate level, Solvay policy is to concentrate sponsoring on actions and programs related to:

- Science & Technology;
- Education.

At local level, Solvay participates in the life of its host communities in many ways, through multiple initiatives which provide indirect and direct added value for the local economy and employment, along with support to local associations and initiatives.

For example, during the summer, the Rosignano plant provides a welcome home unit for groups of children coming from Saharawi families. Working together on these projects offered the plant an opportunity to further cooperate with local institutions, reinforcing a sense of belonging to the community and establishing a solid relationship founded on continuous dialogue and positive neighborly interactions.

Humanitarian actions are undertaken in dramatic situations where Solvay's products and competences can help, mainly in countries where Solvay is active.

Corporate philanthropy & charities

→ [Main corporate initiatives](#)

	2012	2013
Science & technology (Solar Impulse) - EUR million	0,34	0,60
Social & education (XperilAB, International Institutes for Physics and Chemistry) - EUR million	1,93	1,07
Total - EUR million	2,27	1,67

Perimeter: Solvay financial perimeter.

The above figures omit numerous social actions and sponsoring initiatives at local level. Relevant reporting criteria for such multiple actions have not been established. In 2012, €500 000 were awarded to special projects of the Solvay International Institutes for Physics and Chemistry.

■ Science & Technology:

□ Solar Impulse Project

Since 2004, Solvay is the first partner of Solar Impulse, the first airplane to fly solely on solar energy, demonstrating that Chemistry

contributes to constructing sustainable solutions for the planet. Solvay provides the project with expertise in the field of advanced materials and analysis of their behavior in extreme environments.

After the first intercontinental flight in 2012, from Payerne (Switzerland) to Quarzazate (Morocco) and back 2013 was dedicated to a coast-to-coast US flight, from San Francisco to New York City. Solar Impulse's team and partners have built a second solar airplane, with the goal of flying around the world in the first half of 2015.

□ Chemistry for the Future Solvay Prize

The Chemistry for the Future Solvay Prize is one of the highest level of prizes awarded in science. Dedicated to chemistry in the broadest sense, it recognizes achievements in fields ranging from life sciences and physical chemistry to polymer chemistry and environmental chemistry. As the award's title suggests, it looks to the future, and is awarded to a chemist associated with a scientific breakthrough, who is still active in research, offering a potential opening to future developments, applications and industries. In 2013, on the occasion of the 150th anniversary of the company the Chemistry for the Future Solvay Prize was awarded for the first time to Professor Peter Schultz of the Scripps Research Institute in California, and Director of the California Institute for Biomedical Research.

□ International Solvay Institutes for Physics and Chemistry

Other initiatives in the research area are the support to the International Solvay Institutes for Physics and Chemistry and the annual grant to the Queen Elisabeth Medical Foundation (QEMF) which encourages laboratory research and contacts between researchers and clinical practitioners, with a particular focus on neurosciences. The QEMF supports seventeen university teams throughout Belgium.

□ Education (some examples):

Solvay has created the "International IUPAC-Solvay Award for Young Chemists" which will reward 5 young chemists and researchers from top universities all over the world. This is in addition to the "Solvay Awards" which have been recognizing students from two major universities in Belgium for more than 20 years.

Solvay has created a Solvay Chair for Technological Innovation at the University of Louvain which will be supported for the next 3 years.

In the framework of the Xperilab project (www.xperilab.be), Solvay has fitted out a truck as an attractive laboratory, in which a whole school class can carry out real experiments. The truck visits schools across Belgium, hosting more than 10 000 young chemists every year. This initiative is a great success and is booked a full one year in advance.

G4-S01

Percentage of operations with implemented local community engagement, impact assessments, and development programs

Corporate Social Responsibility implies maintaining good relationships with our neighbors. Local communities are directly concerned by the positive and negative impacts of Solvay's operations. Engaging in an ongoing dialogue can be decisive in keeping or obtaining licenses to operate. The Group is keen to maintain relationships of trust with its site neighbors, through strict control of risks and nuisances, dialogue and clear information.

■ Engaging with neighboring communities

Engagement towards local communities is managed at local level by each plant's management. Local initiatives and communication actions are not systematically reported and consolidated at Group level, because of the diversity of local actions.

To assess how neighboring communities perceive Solvay's operation, and to identify areas of improvements, a large program of community surveys has been carried out around 14 locations (Longview and Baton Rouge in USA, Bahia Blanca in Argentina, Paulinia in Brazil, Onsan in South Korea, ...) across the world.

→ 2013 results from neighbour perception surveys

Would you say that Solvay...

... Comply with existing environmental regulations? 12% No, 62% Yes

... Go beyond the law's requirements on environmental protection? 20% No, 36% Yes

Do you think that Solvay...

... Create employment in the local area 11% No, 74% Yes

■ Yes ■ No

Do you think that the Solvay's safety measures to ensure there are no risks to local residents' health is ...

... Exceeding what is necessary 7%
 ... Adequate 59%
 ... Below what is necessary 21%
 NA or Not aware 14%

} 65%

□ Yearly self-assessment by all sites of engagement towards local communities

In 2013, under the Solvay Way reference framework for Sustainability, a first self-assessment has been carried out by all sites, with a significant involvement of a large number of employees. The assessment covers in particular engagements towards local communities, including identification of stakeholders, forms of dialogue, contributing to local economic development by participation in long-term programs (schools, education, improving quality of life). Based on the outcome of this assessment, sites are invited to define action plans to improve their integration with local communities.

■ Engagements towards neighboring communities - examples:

→ Vinythai and Advanced Biochemical site (Thailand)

Actions relative to:	Main action or initiative Solvay Vinythai
Culture & religious	Annual presentation (Kathin)/Buddhism, including financial support for a mosque renovation for the Islamic community,
Learning & school	Collaboration with government agency/NSTDA on making PVC telescopes to celebrate His Majesty the King's 84 th Birthday, with more than 200 students from all parts of Thailand attending,
Community & Internal Safety	Joint development of an emergency response procedure and training for surrounding community and school Annual safety day with community participation
Health & Well-being	Mobile medical service for surrounding communities
Economics	Coordination with 3 surrounding communities to make hand-made gossamer flowers, hand-woven plastic baskets, and bags from scrap vinyl. Solvay's supports relevant training courses by professionals, and invites communities to introduce and sell their products at the plant during internal events (3 times).
Environment & Natural preservation	Support for a project to cultivate coral around PVC pipes since 2008, relevant activity and exhibition displays throughout the year. Now more than 25,000 visitors.
Community contribution	Supporting community activities by, for example, donating PVC pipe to schools Donation of products like sodium hypochlorite to communities and hospitals after the October 2013 floods.
Dialogue & Transparency	Organizing regular plant open days, with communities. The last visit showed high satisfaction rate (90%)

→ Onsan Site (Korea)

Stakeholders	Activities
Local companies, community	Monthly meetings with local companies and community to lead towards safe, healthy, and environmental-friendly operating processes. Exchange of HSE information, networking with local authorities.
Local councils, administration, authorities, community	Onsan site takes part in local council meeting to present 'Best response practices against chemical accidents'.
Community	Assisting the neighborhood farmers through the Environment Association, including an annual financial grant.
Contractors & Suppliers	Explaining & communicating Site HSE requirements to contractors and service providers to ensure their compliance. The site won the Ministerial Award for Contractors Partnerships in a national competition.
Ulsan Development Institute, local KEMCO, Ulsan University, NGO	Providing advice and suggestions as requested. Participating as: Director of Energy section for Ulsan Green Growth Forum; Member of Ulsan Energy Experts' Association; Member of professional council for Ulsan manpower development; Advisor and Instructor for Environmental manpower training center.
Neighborhood students	University, college and high school scholarships.

Inclusion of disadvantaged persons in the workforce

The group encourages the inclusion of disadvantaged persons into the workforce where appropriate. Many sites have taken initiatives. As an example the Linne-Herten production site in the Netherlands employs in its packaging unit 14 persons that depend on outside help to manage their lives. The colleagues are assigned by an organization specialized in bringing into work people with poor job perspectives on behalf of several local communities. The cooperation has existed for several years now. The persons are in work, with state subsidies.

At the Solvay Campus in Brussels disadvantaged persons are regularly employed for 6 to 12 months to give them their first regular job, thereby promoting their ability to integrate into working life and become fit for the working market. Some of these employees have gone on to permanent employment with Solvay.

Awards and Recognition (last 3 years)

The Group and its operational entities receive awards and recognitions for being at the forefront of good management practices.

Group

- **Solvay SA:** Award for Best Belgian Sustainability Report 2012 in the category large organizations by The Institute of Registered Auditors (2013).
- **GBU Rare Earth Systems:** Responsible Care first prize for Rare Earth Recycling from CEFIC¹ (2013) and the Award for Best Innovation for Sustainability by ICIS, (2012)
- **GBU Soda Ash**
 - Certificate for participation in project by CSR Bulgaria (2013)
 - Primus Inter Pares Certificate for CSR activities by the Belgium-Bulgaria-Luxembourg Business Club (2013)
 - 3rd place in the "Investor in Knowledge" category at the Bulgarian Forum of Business Leaders (2013)
- **GBU Aroma Performance**
 - Award for Best Product Innovation by ICIS (2013)
 - SFI Best Poster Award on TFSK derivatives (2013)

Europe

Belgium

- **BRUSSELS SOLVAY CAMPUS** received the "Ecodynamisme" two stars label from the IBGE² for its environmental management (2013)
- **JEMEPPE-SUR-SAMBRE** received congratulations from local authorities for its Seveso information campaign (2011)

Bulgaria

- **CHERNEVO** received an award for highest results in "Extraction of Inert Materials" from the Bulgarian Chamber of Mining and Geology (2013)
- **DEVNYA** received the Primus Inter Pares certificate for Innovation (2012) from the Belgium-Bulgaria-Luxembourg Business Club, the "1st place for Best Socially Responsible Company of the Year" award in the "Investor in Environment" category by the Bulgarian Forum of Business Leaders (2012) and the "Best Socially Responsible Company of the Year" award in the "Environment" category by Pari newspaper and Deloitte Bulgaria (2011)

Germany

- **BERNBURG** received an award for its SCHULEWIRTSCHAFT school-economy engagement network in the "Mein Engagement macht Schule" competition under the patronage of the German Federal Minister of Economics (2013)
- **BAD WIMPFEN** received a special certificate from the Baden-Württemberg Chemical Employers' Association for 'special training performance', a "top apprentice 2013" prize from the same association, and a best apprentice reward (electronics technician for operating technology) from the Baden-Württemberg Chamber of Industry and Commerce (2013). From insurer BF RCI it also received a Special Award for innovative contributions to health protection for the idea and construction of a swivelseat forklift truck (2012) and an award for a Behavior Program at Site (2011)
- **RHEINBERG** received Compressed Air Detectives certification from VCI³ Germany (2013)
- **HANNOVER** received the Oekoprofit Award from by the City of Hannover and Land of LowerSaxony (2010/2011)

¹ European Chemical Industry Council

² Brussels Environmental Management Institute

³ Verband der chemischen Industrie – German chemical industry federation

Italy

- **BOLLATE SITE** received a reward from the Italian chemical industry federation Federchimica (2013)
- **FERRARA**: Premio "Innovazione al Quadrato" (2012) for the electricity consumption and costs reduction project
- **ROCCABIANCA PADANAPLAST**: CEFIC European Responsible Care® Award (2011) for three projects in Italy: CO₂ Emissions Control, Safety at Work, CSR Best Practice in Italy
- **VINYLOOP**: recognized among the top ten companies for green economy "made in Italy" by Fondazione Sviluppo Sostenibili (2011)

United Kingdom

- **DEER PARK** received for the fifth year the Gold Award for Safety in Lostock from the Chemical Industries Association (2013)
- **WARRINGTON** received a Chemicals Northwest Young Achiever Award from Mark Sullivan (2013)

Portugal

- Solvay Portugal: elected President of BCSD⁴ Portugal for 2013-2016 as recognition for its commitment to Sustainable Development (2013)

Spain

- **MARTORELL** received a "No LTA/MTA Accidents" award from the Organization of the Spanish Chemical Industry (2012)
- **TORRELAVEGA** recognized as a business partner of the Coorcopar catering service solidarity NGO (2011) and as an institutional partner of NGOs such as Cantabria and AMAT ALCER Torrelavega (2011)

Latin America

Argentina

- **BAHIA BLANCA**: High recognition for the Environmental Responsible Care Program of the Republic of Argentina Chemicals and Petrochemicals Chamber of Industry (2013) and two awards for the reuse of cleaning water for multimedia filters and for the improvement of the effluents of the electrolysis unit (2011)

North America

Argentina

- **SOLVAY NORTH AMERICA CORPORATE HEADQUARTERS**: 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)
- **AUGUSTA, GEORGIA**: VPP Recertification 2013 and a Safety Award, Recognition for participating in United Way Campaign Recognition, United Way Project Serve Day, National Veterans History Project, Spirit Creek Middle School Science Trip, Cystic Fibrosis fundraiser and other projects from the American Chemistry Council (ACC) (2012)
- **ALORTON**: ACC Responsible Care Initiative award for the HF (hydrogen fluorides) Transportation Training program (2012)
- **CHICAGO HEIGHTS**: Environmental Preservation Award from Automated Services for going Above and Beyond in the area of

- Recycling 2012, a Responsible Care Award for Safety Performance from ACC (2012), and an Award for the Prevention of Occupational Accidents from American Chemistry Council Responsible Care (2011)
- **DOMINGUEZ, CA**: Chevron Products Company Gold Star Award for no Recordable or Lost Time Injuries for each of the last 3 years and a Responsible Care Certificate of Excellence from the American Chemistry Council in recognition of the prevention of injuries and illnesses for employees and contractors (2011)
- **MARIETTA, OHIO**: Certificate of Excellence for no occupational injuries from the American Chemistry Council (2012) and Awards for 100% Achievement with no occupational injuries and over 900,000 safe hours worked from the Mid-Ohio Valley Safety Council (2012)

Asia

China

- **LIYANG**: Safety award from Liyang city (2013)
- **QINGDAO**: three awards from local Government:
 - Social Fire Safety "firewall": Advanced unit (2012)
 - Production Safety Responsibility: Advanced unit, (2012)
 - Safe Production Responsibility: A-class enterprise (2011)
- **BEIJING**: "best partner" from P&G Tianjing (2011)

India

- **PANOLI**:
 - the "Winner in Design Category" for waste water minimization project by the International Water Association (2012)
 - the Award for Excellence in Safety from the Federation of Indian Chambers of Commerce and Industry
 - the Award for HSE Excellence by the Indian Chemical Council
- **ROHA**: Longest Accident Free Period and Lowest Accident Frequency Rate from National Safety Council (2012)
- **Savli RD&T Centre**: "Safety in Excellence" by the Federation of Indian Industry and Commerce (2012)
- **SRIKALAHASTI**: Environmental Best Practice award from the Confederation of Indian Industry (2011)

South Korea

- **INCHEON**: Award for environment conservation from the Environment Minister (2012), an Award for Community Development from the city's mayor (2012) and an Environment award from Incheon city (2011)
- **ONSAN**:
 - Certificate for achieving rolling 6 years Zero Accident from MOEL (2013)- confirming zero accident record at the Onsan site from July 2008 to September 2013.
 - Certificate of HSE Mentor site for training Korean Companies. Recognized by MOEL (2013)
 - National Emergency Preparedness competition Award of Excellence from MOEL (2013)
 - An Presidential Citation on 'Day of Environment' - Awarded by the President of Korea (2012)
 - CSR Award for contractor's HSE Program Development Partnership No.1 in Korea by effective Critical Task Analysis deployment - Awarded by the Minister of Employment & Labor (MOEL) (2012)
 - Citation on 'Day of Occupational Safety & Health' - Awarded by MOEL (2012)
 - Citation on 'Day of Fire-Fighting' - Awarded by the Minister of Public Administration and Security (2012)
 - Certificate for PSM (Process Safety Management) consulting site for large Korean companies - Recognized by MOEL (2012)

⁴ Business Council for Sustainable Development

Social

Society

Thailand

- **MAP TA PHUT - EB:** Safety award from Liyang city (2013)
 - Governance Award from Industrial Estate Authority of Thailand (2013)
 - Leader of Voluntary Energy Saving Agreement program (2013)
 - Zero Accident Awards - Silver Level, from Ministry of Labor (2011-2013)
 - Green Industry Certificate - Level 4, from Ministry of Industry.
 - Thailand Energy Award from Ministry of Energy (2012)
- **MAP TA PHUT VINYTHAI:** Safety award from Liyang city (2013)
 - Zero accident award by the Ministry of Labor; Green industry certificate from the Ministry of Industry (2011)
 - Good Environment Governance award from the Industrial Estate Authority of Thailand.

Anti-Corruption

G4-S04

Communication and training on anti-corruption policies and procedures

Solvay's Code of Conduct is supported by several policies, including a policy on corruption. This policy, supporting guidelines and tools are available to all employees on Solvay's corporate internet website. Solvay communicates on the specific policy and provides more detailed training either at Group level or to targeted audiences.

Solvay prohibits bribery in any form. Exchanging token gifts and entertainment with customers or suppliers is permitted. Solvay and its employees do not use gifts or entertainment to gain competitive advantage.

Public policy

→ **2013: 5 FTEs in corporate and 11 in the regions**

Advocacy staff, Solvay Group	2011	2012	2013
Corporate	6	5.5	5
Regions	13	12	11

Perimeter: Solvay financial perimeter.

Legend: Number of persons (FTEs equivalents) in public affairs.

To act in all situations in line with the Group's vision, mission and values, to foster the best possible business environment for the Solvay group, and be recognized as a responsible actor in business public authorities/stakeholders dialogues.

16 Solvay employees are directly involved in the management of these matters: 5 at corporate level and a network corresponding to 11 FTEs at national/regional level in Europe, the United States, Asia, and Latin America. 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.

Solvay has direct and indirect contact with policy makers and public officials on issues of relevance to the Group. This includes participation in trade associations such as BusinessEurope, the European Round Table of Industrialists, the American Chemistry Council, and the European Chemical Industry Council. Solvay also engages directly with stakeholders through responses to European stakeholder consultations and attendance at Parliamentary hearings and debates where relevant.

The success of Solvay's efforts to engage sustainably 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. The Government Affairs function has been further strengthened in 2013 through the adoption of a binding Group policy on government and public affairs which applies to every member of the Solvay Group. It notably sets a red line for all employees whereby the selection and retainment of any public affairs consultant must be done with the approval of the Government Affairs function.

Issues	Stances
Fight against climate change	Contributing to the development of a clear and predictable legislative framework for climate change policy in the EU and globally in the post 2020 period. Contribution to various pieces of legislation developing a climate-friendly framework for business.
Responsible chemical handling	Taking the chairmanship of the International Council of Chemistry Associations (ICCA) Responsible Care program to drive the safe handling of chemicals around the world and across the value chain.
Supporting intellectual property (IP)	Supporting the development of a strong framework for the protection of IP in the EU to foster innovation through engagement in favor of the defense of trade secrets.
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.
Industrial Policy	Solvay sponsored the economics think tank Bruegel to write a report on the future of European manufacturing and industrial policy (http://www.bruegel.org/nc/events/event-detail/event/384-manufacturing-europes-future/) in order to highlight the importance of creating the right framework conditions to enable sustainable development of Europe's manufacturing industry.

Anti-competitive Behavior

G4-S07

Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes

Solvay's code of conduct is supported by a policy on competition law. Solvay values fair and open competition. The Group does not enter into business arrangements that distort, eliminate or discourage competition, or that provide improper competitive advantage.

Compliance

G4-S08

Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations

In May 2006, the European Commission imposed a fine in an aggregate amount of €193 million against Solvay for alleged breaches of competition rules in the peroxygens market. Solvay appealed the decision of the European Commission and the European General Court reduced the fine to €152.3 million. This reduced fine was confirmed by the European Court of Justice in December 2013.

In Brazil, Solvay is facing administrative claims related to alleged cartel activities in various markets. The Brazilian antitrust authority issued fines against Solvay and others in May 2012 (Solvay's share of the fines is €29.6 million) related to H2O2 activity, Solvay has filed a claim contesting these administrative fines before the Brazilian Federal Court.

Supplier Assessment for Impacts on Society

G4-S09 Percentage of new suppliers that were screened using criteria for impacts on society

The Solvay Purchasing Process consists of five individual steps that are interlinked:

1. Define Customer Needs & Analyze Market;
2. Define Purchasing Strategy & Source;
3. Negotiate and Contract;
4. Manage Supplier Performance;
5. Manage System Performance.

For each tender, suppliers are qualified, selected and evaluated with one single methodology across the world. This methodology grades suppliers from 1 to 4, both specifically and globally and taking into account 5 axes: competitiveness, quality and security, products and services risks, innovation and strategic relationships, and CSR.

For more details on Together for Sustainability Initiative, the reader is referred to page 93.

Grievance Mechanisms for Impacts on Society

G4-S011 Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms

→ Compliance with the Code of Conduct

	2012	2013
Cases Reported	18	17
Cases Investigated	18	15

Solvay relies on its employees to support the Code of Conduct in every manner. Employees who need clarification about the application of the Code of Conduct, who know of an ethical or compliance issue, or who believe in good faith that non-compliance issues are occurring at Solvay are encouraged to come forward.

The first and best place for employees to Speak Up is with their individual manager or supervisor. In addition, employees may seek help from any other manager or supervisor; they may go to a member of the local or regional HR, Legal Department, Internal Audit or the Compliance Officers. As an alternative, employees may wish to use the Ethics Helpline, maintained by a private third party and operated in accordance with local law. All reports will be investigated and all investigations will be conducted in a manner that reflects Solvay's values, its respect for the rights of all parties involved and applicable law. In 2013, Speak Up was not yet deployed group-wide due to national requirements and social regulations.

In no event shall an employee who makes a report be subject to retaliation. Any person, regardless of position, who engages in retaliatory behavior will be subject to disciplinary action. Provided that reports are made in good faith, no action will be taken against an employee raising a concern that eventually proves to be inaccurate. Abusive accusations will not be tolerated.

PRODUCT RESPONSIBILITY

□ Contributing to sustainable consumption

Solvay has the objective of being a global industrial model in sustainable chemistry, and in particular to enlarge its portfolio of products and markets supported by good sustainability perspectives. Acquiring Rhodia's portfolio was a step in this direction.

Solvay innovations and solutions help protect the environment in daily life and in industry. They are used in air-emission control, soil remediation, water supply and treatment, gas-separation membrane technologies and water purification membranes. In construction, many products offer better sustainability of paint and coatings manufacturing, thermal insulation, window frames, electrical wiring, cabling, and pipes and fittings for heating and cooling systems, as well as blowing agents and flame retardants. With regard to mobility, Solvay's silicas make tires more energy-efficient, while our engineering plastics and specialty polymers lighten the weight of vehicles. We also develop materials based on rare earths used in low-energy lighting. For industrial customers, Solvay brings solutions that increase energy efficiency in industrial installations or the amount of energy stored in lithium batteries. Our products are used to generate energy from renewable resources (solar and wind), fuel cells, gas-diffusion membranes, and in heat transfer.

Solvay is also proactive in developing recycling technologies and schemes and in promoting initiatives through various channels. Solvay is usually one player among others in the recycling value chains. Quantitative indicators are difficult to establish due to the diversity of products, applications, initiatives.

Assessing product sustainability with robust and standardized methodologies is key. The Sustainability Product Management tool (SPM) evaluates the sustainability of Solvay products in their applications (For more details, see pages 35-39). Establishing product risk assessments (For more details, see pages 107-108) and ecoprofiles is a continuous process.

For more details on renewable raw materials, the reader is referred to pages 50-51.

Product Stewardship

"Product Stewardship" focuses on ensuring environmental, health, and safety protection by involving all stakeholders in the full lifecycle of a product, encouraging them to take responsibility for ensuring product safety in the broadest sense. It covers the recognition, control, and communication of a product's environmental, health, and safety related effects- from production (or extraction) through to final disposal or reuse. This covers, for example, marketing authorizations, safety during transport, use, disposal, and risk control at every stage of production.

Product Stewardship forms a key aspect of ICCA's responsible Care WORLD charter signed in 2007.

Our policy is:

- To take actions and carry out product stewardship programs that contribute to the safe management of hazardous products throughout their lifecycles during use and disposal with a particular attention to products involving higher risks.

□ Management of Product Stewardship

Solvay deploys product stewardship along 10 action lines. In addition to horizontal management, covering all substances, dedicated action is taken for Substances of Very High Concern, for substances for the health, feed and food markets, and for a number of chemicals with hazardous properties, such as peroxides which deserve special attention in terms of fire hazards.

→ [Product Stewardship is deployed along 10 action lines](#)

Product knowledge and compliance	1. Comprehensive understanding of each product's hazards, risks and impacts related to its whole life cycle	- Product knowledge and compliance pages 106-107 - Supplying Product Safety Information - pages 106-107
	2. Identification of Substances of Very High Concern and risk assessments	- Substances of Very High Concern (SVHC) and their substitution - pages 107-108
	3. Environmental profiles	- Ecoprofiles of products - page 66
Product safety in operations	4. Preventing risk at the workplace	- Industrial hygiene standards - page 86
	5. Management of Substances of Very High Concern and striving to substitute with safer alternatives	- Industrial hygiene standards - page 86 - Substances of Very High Concern (SVHC) and their substitution - pages 107-108
	6. Complying with product technical specifications	- as part of quality management
Product information	7. Ensuring Safety Data Sheets sent to customers and revised at least every 3 years	- Supplying product safety
Product safety during use	8. Dedicated product stewardship programs addressing specific products, markets and customers	- This section - Substances of Very High Concern (SVHC) and their substitution - pages 107-108
	9. Safety during distribution	- Transport safety - page 69
Recycling	10. Recycling of end-of-life products	- End-of-life product recycling - pages 67-68

Product stewardship for peroxides

The product stewardship program for peroxides is fully deployed and must be maintained in order to keep an adequate level of safety awareness at the customer level. REACH registration dossiers were submitted for substances below 1 000 tons. Through continuous collaboration with customers and hauliers we are managing risks associated with our products and once again have had no high severity incidents. As part of our ongoing commitment towards our partners, we are developing new training tools such as online training and videos for specific products.

A dedicated program for applications in health, feed and food (HCRM process)

The aim of the HealthCare, Food and Feed Risk Management is to avoid risks for users from substances used in healthcare, food and feed applications. This covers pharmaceutical uses, food, drinking water, food and drinking water contact, cosmetics, medical devices such as suture filaments, and pharmaceutical and medical devices packaging. Following dedicated risk management initiatives focused on, amongst other things biomaterials for human implants (Solviva®), an HCRM Solvay policy has been defined to improve the risk control for substances placed on the market with Healthcare, Food and Feed applications.

Sustainable products and solutions

See also:

- Renewable raw materials pages 50-51;
- End of life product recycling: pages 67-68;
- Substances of Very High Concern (SVHC) and their substitution: pages 107-108;
- Highlights on sustainable innovation: pages 40-41.

a. Energy saving

■ Chemical solutions for the fast-growing oil & gas market

The acquisition of the privately-held Chemlogics has been completed. As part of the Group's transformation towards an innovative chemical solutions provider, this acquisition brings an extensive portfolio of tailored chemical solutions for the fast-growing oil & gas market. Solvay Novocare is developing and commercializing new generations of surfactant viscosifiers and guar derivatives for this market. Requirements for fluid viscosifiers used in oil and gas extraction technologies are becoming more and more demanding. This is due, not only to the harsher conditions (higher temperatures, higher salinity), but also to the need to increase the recycling of process water and to use less fresh water.

■ SolviCore launched Greenerity™ product line

SolviCore GmbH & Co. KG is a joint venture between Solvay and Umicore. SolviCore recently launched the Greenerity™ product line at Solvay's Event during "European Hydrogen Road Tour 2012". SolviCore is a membrane electrode assembly (MEA) producer, with a new product line for fuel cell and electrolysis applications. SolviCore develops and produces key electrochemical components used in emission-free hydrogen generation via electrolysis and electricity generation via fuel cells.

■ New halogen-free flame retardant polyamides for mobile devices

A new series of halogen-free flame retardant polyamides has been launched. This expands the Kalix® high-performance polyamide product line for use in the structural parts of mobile devices such as tablets and laptops. The newly launched Kalix® HPPA 5000 series complements Solvay's new portfolio of bio-based Kalix® HPPAs for mobile devices which was also introduced at K 2013.

■ Fluorinated polymers for high-performance lithium batteries: agreement with the Bolloré Group

The emergence of vehicles that are less polluting relies on improved battery performance. An increasing number of vehicles, combining an internal-combustion engine and an electric motor, make use of lithium batteries. Hybrid vehicles have the potential to reduce CO₂ emissions by around 30% compared to conventional engines. The fluorinated polymers of Solvay Solexis are ideal compounds for some components of such new-generation batteries, including the adhesive binders for the electrodes, separators, and additives for electrolytes. In 2013, an agreement was signed to supply lithium salts to the Bolloré Group for its energy storage activities, in addition to the fluorinated polymers Solvay already supplies to them. Specialty lithium salt grades are the preferred option for such batteries, developed by BatHium and BatScap.

■ Silica for green tires

One in five automobiles in the world use energy efficient tires containing Solvay Silica. The Zeosil® range of silica products is used in place of carbon black to produce tires with lower rolling resistance. Solvay and its customers have helped to reduce CO₂ emissions by more than 40 million tons worldwide, the equivalent of 16 billion liters of fuel. In 2013, Solvay decided to build a new facility in Poland to produce highly dispersible silica, which will increase the company's HDS capacity by 85 000 tons per year.

b. Water management

■ Advanced Polymers at the heart of high-performance water management

The manufacture of "holofibres" and tubular membranes used for water treatment (notably low-pressure filtration and seawater desalination) is based on high-performance polymers. Solvay's UDEL® polysulfones, because of their lifespan and stability to light, also tend to be used in blood dialysis, solar furnaces, water heaters, or for dip tubes in self-cleaning commercial water heaters. The barrier properties of products in the AMODEL® and IXEF® ranges are now used for applications aimed at reducing gas releases from fuel tanks, and in hybrid vehicles.

■ Hydrogen peroxide in advanced depolluting treatments

Solvay's hydrogen peroxide is widely used in many environmental applications, due to its oxidation capabilities; it effectively decomposes polluting molecules in water effluents. Its key uses are in waste water treatment, water potabilization, NO_x abatement, Fenton's treatment and advanced oxidation processes, cyanide and nitrite treatment, control of reduced sulfur species, and soil remediation. It is particularly efficient at detoxifying aqueous waste streams. In 2013, additional successes in odor control of wastewater were obtained.

■ Peracetic acid in water disinfection

When used as a disinfectant, peracetic acid decomposes to yield water, oxygen, and acetic acid. As a strong oxidant it is a powerful, non-remnant biocide. Recent commercial developments include municipal waste water disinfection in the USA and Italy.

c. Cleaner environment

■ Producing fluorine gas at the customer premises

A partnership has been established with Air Liquide to build, own and operate such "delocalized" fluorine cleaning gas units at the customer's premises (photovoltaic and semiconductor industries). The first installation was successfully rolled out in May 2013, in Korea. Industrialization of this technology to produce fluorine gas at the customer premises ("F2 onsite") allows a substantial reduction in greenhouse gas emissions by users.

■ Polymers contributing to improved prevention of harmful substances

A range of polymers manufactured by Solvay reduce exposure to harmful substances. A few examples of these beneficial polymers are: Amodel® (used in particle filters for diesel exhausts) Acudel® (leading fitting solution preventing exposure to lead, by avoiding weldings), and Duradex® (helping to avoid bisphenol A in baby bottles and food services).

■ Better crop yields by more efficient germination and development of young seedlings

The innovation portfolio for Novocare Agrochemicals Specialties has been expanded into seed boosting. The seed boosting technology based on the "GSB agro-polymer" creates a more favorable environment for seeds to germinate, and promotes root development. This ultimately results in better crop yields. Other applications of this range of polymers for agricultural uses are in bio-activation, anti-drift effect (to prevent the drift and losses during pesticide application) and as a wetting adjuvant to increase the bio-availability of active ingredients in pesticide, therefore allowing minimization of the quantities of active ingredients used.

■ High-performance water-based anti-corrosion paints releasing minimum amounts of volatile organic compounds

Protecting steel structures against corrosion and ensuring longer life requires coatings with very low water permeability, high resistance, and strong adherence. The water-based paints used for this purpose have the advantage of better protection for the environment and for health. This is the case with paints based on nanoparticles of DIOFAN®, a polyvinylidene chloride latex developed in collaboration with BASF. These paints have the polymer's barrier properties and

great resistance, while releasing only minute amounts of volatile organic compounds when the paint is applied.

■ Sodium bicarbonate in waste incinerators to neutralize acidic flue gases

The process developed by Solvay (SOLVAir process[®]) has continued to be successfully implemented in many coal-fired power plants, as well as other industries or waste incinerators in Europe and in the US. In 2013, Solvay signed up its largest user yet for sodium bicarbonate for flue gas treatment. This has increased the size of the entire US BICAR market by about 10% and SOLVAir North America sales by more than 20%. The sodium bicarbonate BICAR[®] is active in a large range of moisture content and temperature conditions. This is why, for example, the neutralization of flue gases avoids water injection for cooling/conditioning purposes and reheating of the flue gas upstream of a catalytic DeNO_x system. By savings in flue gas reheating, and by optimizing heat recovery, energy efficiency is boosted by the SOLVAir process - offering the best energy recovery rates as compared to alternative processes.

> See: www.solvairsolutions.com

■ Sustainable use of additives in PVC

ESPA and EuPC are committed to replacing lead stabilizers across the EU-27 by the end of 2015. In the 2007-2012 period, lead stabilizer consumption decreased by 76 364 tonnes (-76.37%). In 2013, the use of lead-based stabilizers was down an estimated over 80% in the EU-27 compared to 2007.

■ Building a new plant to produce ethoxy-4,4,4-trifluoro 2 butene-on as a building block for the agrochemical industry

A new plant with an annual production capacity of 1 kt of ethoxy-4,4,4-trifluoro 2 butene-on (ETFBO) for the agrochemical industry will come onstream by the end of 2014. ETFBO was selected and developed by GBU Special Chemicals because fluorine atoms in agrochemical and pharmaceutical active ingredients have several positive effects. About 50% of new crop protection molecules and 33% of new pharmaceutical projects contain a fluorine atom, and this figure is trending upwards. Several novel key agrochemical projects are based on ETFBO as a building block.

For more details on Sustainable innovation highlights in 2013, the reader is referred on pages 40-41:

- Further developments in Organic Light Emitting Diodes (OLEDs);
- Collaborative project MAT4BAT dedicated to advanced materials for Li-ion batteries;
- Demonstration of an innovative diesel fuel additives system;
- Semi-transparent organic photovoltaic cells on large area coating;
- High performance modified wood;
- Allowing lower environmental impact solvents during rubber synthesis.

Customer health and safety

G4-PR1

Percentage of significant product and service categories for which health and safety impacts are assessed for improvement

■ Regulatory compliance

Nearly 15 000 chemicals, including many different grades, are on the market. Solvay is committed to attaining a comprehensive understanding of each product's hazards, risks and impacts. It is a legal requirement to include safety information to downstream users for each product, in particular for those chemicals with a potential hazard related to their intrinsic properties and/or risks related to the conditions of use. The worldwide GHS system aims to harmonize the classification and labeling of chemicals worldwide.

We provide this information for all our products and to all customers and downstream users, as a key aspect of product stewardship is to provide all necessary information to all stakeholders involved, in order to allow them to comply with their own risk management and product safety obligations.

"Substances of Very High Concern" (SVHC) deserve special attention, in terms of identification, control and substitution.

■ Product knowledge and compliance

Understanding product hazards and risks, managing product knowledge

Our policy is:

- To maintain a comprehensive understanding of each product's hazards, risks and impacts related to all life cycle steps and intended applications;
- To manage product knowledge so as to comply with local requirements on product information while ensuring worldwide consistency;
- To keep all necessary and required information on product safety to ensure availability throughout the full life cycle, beyond the commercialization period.

□ Managing Product knowledge and compliance

Solvay manages product information centrally. In the framework of evolving legislations, particular effort has been invested in the past years to improving the knowledge of the conditions under which products are used, so as to record and assess any associated risks. The success in the REACH registrations, and the availability of SDS for all our products, clearly reflect the good product knowledge and the efficiency of our product data management in general.

Solvay deploys the requirements of the Global Harmonized System (GHS) by implementing the "blocks" of requirements defined by each country. Solvay, in particular, is fully in-line with the current requirements for Europe (ie the Classification, Labelling and Packaging European framework). In addition, many Safety Data Sheets have also already been updated to comply with new GHS requirements in other regions. So each country offers a different reality: the principle of "Building Blocks" allows each country to have varied deployment modalities: starting date, transitional period, different editions of GHS etc.

Countries where Solvay is currently actively implementing GHS:

- Western Europe: European Economic Area (EEA);
- Asia Pacific: Japan, China, South Korea, Taiwan;
- Latin America: Brazil;
- North America is planned for 2015.

The Globally Harmonized System of classification, and labelling of chemicals

GHS is an initiative by the United Nations to harmonize the classification and labeling of chemical substances worldwide. In the EU these requirements are contained within the Regulation on the Classification, Labeling, and Packaging of substances and mixtures. This CLP Regulation applies to all Solvay's substances and their applications, and to all activities relating to their production, import, marketing, and uses. The deadline for compliance of individual substances with the CLP Regulation was met in 2010.

In the European Union in 2012, about 20 new CLP notifications for substances were submitted by Solvay. GHS is also progressively transposed in the regulatory system of other countries.

→ Solvay 1st registration phase and 2nd registration phase (2010 and 2013), registrations planned for 3rd phase (2018)

	Number of substances	Substances for which Solvay is lead registrant or alone	Number of dossiers submitted to the European Chemicals Agency	Dossiers accepted by ECHA
1st registration phase 2010	167	76	276	100%
2nd registration phase 2013	161	69	175	100%
Total	328	145	451	100%
3rd registration phase planned - deadline 2008	397	428		

Total success for 451 REACH registrations: The REACH legislation has permitted a better knowledge of substances through the collection of new information. Since the beginning, in 2010, Solvay has submitted 451 dossiers for registration, with a 100% success rate. Solvay was lead registrant for 145 substances. On the basis of the knowledge assembled within REACH, the GHS classification of Solvay products has also been updated.

Preparation for the 3rd registration phase is now on track. This will focus on chemical substances produced or imported in lower quantities, between 1 and 100 tons per year. About 428 dossiers, covering 397 substances, are planned to be submitted before the end of May 2018.

In addition to this, due to the availability of new available information, or at the request of ECHA, 56 updates of registration dossiers were submitted in 2013. Workshops and training sessions are organized to make our product stewards and HSE networks aware of REACH enforcement.

□ Successful inspections on sites in 2013

In 2013, two REACH inspections by authorities took place successfully, one at the Massa site (Italy) and the other at the Povoa site (Portugal).

6 Internal audits and 2 dedicated training sessions were organized in 2013 by our HSE internal teams to prepare our sites for REACH inspections.

■ Animal testing

Our policy is:

- To apply in each case the "3R principles": (Replacement, Reduction, and Refinement) and to comply with all applicable regulations;
- When tests are needed, to commit to the greatest care, professionalism, animal welfare and humaneness.

→ Animal tests commissioned by Solvay (2013)

	All animal tests	Tests on vertebrates Distribution across regions
Addressing specific requests from		
European authorities	56%	42%
Asian authorities	6%	5%
American authorities	8%	45%
Multiple authorities	11%	3%

Legend and perimeter: All tests on vertebrates carried out on behalf of Solvay, 2013.

□ Management of animal testing

To ensure compliance with existing and new chemical regulations, Solvay has commissioned animal tests in the past 5 years. No animal testing has been conducted within the last five years for cosmetic uses. 6 570 vertebrate animals were used in 2013. All were submitted to an ethical assessment.

Solvay has a mission to provide innovative products and services, for a wide variety of uses and a large number of users. A proper understanding of our products is indispensable to legitimate our activities and to protect users, our personnel and the general public. Society expresses a continuing demand for new and/or better chemicals and plastics. There is a growing demand for product safety, hence for testing, with and without using animals. For example, for Asian markets, the demand for animal testing is particularly active due to specific expectations from the general public and politicians.

In 2013 Solvay commissioned tests required by regulation, trying every time to minimize the number of animal tests. In terms of the number of animals, regulation for chemicals is of course far less demanding than what is required in the pharmaceutical sector to test the efficacy of drugs, resulting for Solvay in comparatively much fewer tests. In 2013, 81% of tests carried out on behalf of Solvay (representing 95% of the vertebrate animals) addressed specific requests from authorities, while 19% (5% of vertebrate animals) were carried out to address more generic product-related questions. Nearly all studies complied with international standards (OECD-guidelines), thus avoiding duplication by addressing simultaneously the requirements of several countries or regulations. Solvay did not commission studies on dogs, cats, pigs or non-human primates.

□ Chemicals in the framework of REACH

Solvay adheres to the objective as outlined in the REACH regulation, i.e. promoting non-animal testing and the replacement, reduction and refinement of animal testing. For a responsible and humane use of laboratory animals, Solvay has for a long time had a policy on animal use. In 2013, most animal tests for Solvay products were carried out in the framework of the REACH Regulation.

No specific testing for cosmetics or toiletries ingredients

Solvay manufactures products which have to be tested on animals, for regulatory reasons. Some of these substances are also used, but never exclusively, for the manufacturing of cosmetics or toiletries ingredients. So, although substances produced by Solvay and used for cosmetic or toiletries applications have been tested on vertebrate animals within the last five years, no turnover has been generated in the last five years on substances tested on vertebrate animals and solely intended as ingredients for cosmetic or toiletries products.

Consortia

Membership of consortia means that mandatory studies on a particular product have to be performed only once for all producers, importers or users taking part in the consortium. Solvay has contributed to consortia mainly in the framework of REACH (such consortia also exists for biocides).

Solvay is active in markets related to food, feed, health

Solvay has a strategy to increase activities in high added-value applications, in particular in markets related to food, feed and health. These are usually also highly regulated applications in terms of product safety testing.

Product and service labeling

G4-PR3

Type of product and service information required by the organization's procedures for product and service information and labeling, and percentage of significant product and service categories subject to such information requirements

■ Supplying product safety information

Solvay has centralized management of product safety information and Safety Data Sheets (SDSs) distribution.

Our policy is:

- To provide all necessary information to all stakeholders concerned, avoiding any concealing of validated information about hazardous characteristics of products;
- To establish Safety Data Sheets as required by regulations (SDSs), and beyond with the aim of adequately protecting users and the environment;
- To maintain and distribute SDS consistently worldwide, for all products and all customers, They ensuring that SDS are revised at least every 3 years, for all products put on the market.

□ Management of product safety information

Maintaining safety data sheets is a continuous process. 100% of products concerned by the new European CLP requirements are covered. Product safety information is managed centrally via two systems (SAP/EHS): these central databases are aimed at helping to achieve worldwide compliance with all applicable product regulations. They ensure consistency of the information provided via "Safety Data Sheets" in all countries. A convergence of these 2 systems is being worked on.

In 2013, in line with worldwide GHS implementation, Solvay updated and/or developed the SDSs for a series of countries: Brazil, Singapore, Thailand, China, Japan, and South Korea. Work is underway to adapt to the GHS model with new versions of SDSs, for example: for the USA by 2015, and for mixtures for Brazil by 2015, for Turkey and other countries.

Each GBU must have a process for SDS compliance and distribution

Global Business Units are required to ensure that their SDSs are revised at least every 3 years, for all the products placed on the market. SDSs are sent to customers at first delivery and are maintained and distributed consistently worldwide, for all products, to all customers, in the appropriate language, every time they have been significantly modified.

Safety Data Sheets for all products: a key instrument

Safety Data Sheets have a dual purpose: (1) Fulfilling a regulatory requirement; (2) Providing the best relevant information on the conditions of use, storage and handling of our products. They provide systematically all the required information on the identity, physicochemical properties and hazardous properties of each substance, the associated risks and the safety measures to be applied in their use. Efforts are made to supply this accurate information in full compliance with the regulatory frameworks like GHS or REACH and CLP (Classification, Labeling and Packaging) regulations in the EU.

130 “Product Safety Summaries” already available

As part of the Global Product Strategy (GPS) of the International Council of Chemical Associations (ICCA) started in 2006, Solvay has committed to preparing Product Safety Summaries and making them widely available. The key idea of the PSS world project is to make available basic safety information - chemical identity, physicochemical properties, uses, potential health and environmental hazards, recommendations on safe use - while making this information understandable for the layman and a broad public. PSS are therefore a cornerstone to distributing product information as broadly as possible, and to promoting safe use everywhere. Solvay is one of the most advanced companies in Europe in this respect, with 130 PSS on chemicals in commerce now available on the ICCA and Solvay websites.

Marketing and communications

G4-PR6

Sale of banned or disputed products

Solvay is deeply committed to comply with all applicable laws and regulations related to products and to define and deploy voluntary commitments that go beyond these laws and regulations. A number of sold products incur particular risks because of their high reactivity and toxicological properties. In particular, Solvay sells Substances of Very High Concern (under the REACH definition). These substances are of course authorized, but require to be handled and used under strictly controlled conditions. Solvay has a pro-active approach for this class of substances.

■ Substances of Very High Concern (SVHC) and their substitution

Our policy is:

- To identify Substances of Very High Concern used or produced, update risk studies, and strive to substitute them with safer alternatives that are technologically equivalent and socioeconomically sustainable;
- To handle Substances of Very High Concern under strictly-controlled or equivalent conditions.

→ **Animal Solvay substances of very high concern (Europe, according to REACH definition)**

Substances manufactured by Solvay or part of the composition of products sold by Solvay currently in the candidate list or the authorization list of the REACH process	In raw materials	In finished product pt on the market
Substances in candidate list	29	17
Substances in authorization list	10	6
Total	39	23

Perimeter: Solvay group perimeter under operational control, Europe, including Benvic.

Legend: Substances manufactured or used (as raw materials or for maintenance) by Solvay currently in the candidate list or the authorization list of the REACH process. The candidate list is the first step before a substance eventually enters the authorization list, and therefore the authorization process. Some of the substances in the candidate list are susceptible to enter the authorization list at a later stage. Additional substances will also be continually added to the candidate list.

□ Voluntary rules for SVHCs

In Europe, a now-approved definition of SVHC allows for a clearer picture in this region. On this basis a world inventory of SVHCs within the Solvay Group is planned for 2014 for other zones.

In Europe, Solvay manufactures and markets 3 substances that were registered in the first and second registration phase of REACH as Substances of Very High Concern belonging to the “candidate” list and the “authorization” list according to the definition of this regulation. These substances are classified respectively Carcinogenic, Toxic for Reproduction, and Carcinogenic + Toxic for Reproduction.

Social

Product Responsibility

Solvay also uses raw materials that are SVHC according to the European regulation: 39 substances listed in Annex XIV or in the "Candidate List" of REACH were purchased by Solvay in 2013 for use in production or maintenance in European industrial sites, for use as raw materials, solvents, or catalysts.

So, in total, 23 SVHCs (produced by Solvay or coming from raw materials incorporated in Solvay products) are part of the composition of products that Solvay markets in Europe. 6 of them should undergo the authorization process, but Solvay is carrying out studies to substitute 5 of them in the short-term with a non-SVHC substance. The 17 other substances will be studied in order to define a replacement strategy in cooperation with suppliers.

Solvay has a dedicated multidisciplinary team to handle SVHCs. This advisory team supports the business in ensuring a sustainable management of all SVHCs manufactured, imported, and placed on the market and/or used by Solvay.

Such substances are sold exclusively to professional customers that are fully aware and able to manage the associated risks.

While providing recommendations to the business, the team contributes to securing business continuity in respect of legal duties and the Group's Responsible Care Global Charter® commitment.

In 2013, based on Group redefined criteria for such substances and voluntary management rules, a global controlled inventory of SVHCs was drawn up. This will allow:

- Complete inventories of SVHC substances throughout operations;
- Improved risk control during manufacturing and use of these substances in marketed products;
- Systematic communication to customers, through the Safety Data Sheets, the risk measures;
- Systematic investigations of safer alternatives (For more details on product stewardship, the reader is referred to pages 101-102);
- Reduced uncontrolled releases by Solvay manufacturing plants (For more details on environmental management, the reader is referred to pages 48-49);
- Reduced occupational risks for the personnel (For more information on occupational health and safety, the reader is referred to pages 78-86).

Substance of Very High Concern - Definition according to EU regulation

SVHC refers to substances placed on the market or used as intermediate raw materials by Solvay, and identified according to the SVHC definition in the framework of the application of the REACH regulation.

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 (PBT) 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").

Contact

■ To learn more about Solvay:



Solvay Annual Report



Download the Annual Report at:
www.solvay.com/en/investors/index.html

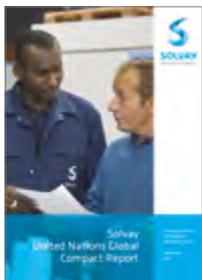
■ To learn more about our sustainable development approach:



Solvay Way Presentation



View the presentation at:
www.solvay.com/en/sustainability/index.html



Solvay United Nations Global Compact Report



IndustriALL Agreement



■ Publication management

Group General Manager
Sustainable Development
Jacques Khelif

Isabelle Cornu (isabelle.cornu@solvay.com)
Leila Jmili (leila.jmili@solvay.com)

Solvay sa
Rue de Ransbeek, 310
1120 Brussels, Belgium

T: +32 2 264 2111
F: +32 2 264 3061



Layout and production:

 **PUBLICCORP** - 12725



Morris & Chapman

Publication management:

Solvay General secretary and Communication
Sustainable Development Management

Photos:

GettyImages, Solvay.

Printing:

Hayez



Solvay sa

Rue de Ransbeek, 310
1120 Brussels
Belgium
T: + 32 2 264 2111
F: + 32 2 264 3061

www.solvay.com

 www.facebook.com/solvaygroup

 www.twitter.com/solvaygroup