

# Dedicated to building a model of sustainable chemistry



**SOLVAY**

asking more from chemistry®



Complementary Annual Report  
on Corporate Social Responsibility  
informations

2014  
GRI  
Annual  
Report

# Table of contents

<b>1. Message from Jacques Kheliff</b>	<b>1</b>
<b>2. GRI Content Index</b>	<b>2</b>
<b>3. Sustainability statement</b>	<b>15</b>
<b>4. Economic</b>	<b>41</b>
<b>5. Environment</b>	<b>49</b>
<b>6. Social</b>	<b>75</b>
<b>7. Contact</b>	<b>106</b>



*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.*

## **G4-DMA on Economic performance**

### **Solvay, asking more from chemistry**

Solvay is an international chemical Group that assists its industrial clients in finding and implementing ever more responsible and value-creating solutions. Solvay generates 90% of its net sales in activities where it is among the world's top three players. It serves many markets, including energy and the environment, automotive and aeronautics, electrical and electronics. Solvay's chemists seek to bring sustainable responses to the challenges facing our planet. The Group is headquartered in Brussels and employs about 26,000 people in 52 countries. In 2014, it generated 10.2 billion euros of net sales. Solvay SA is listed on Euronext in Brussels and Paris.

**G4-1**

## Message from Jacques Kheliff

G4-1



Sustainable development is a path of continuous improvement. Sustainability performance reporting requires having robust processes and respecting rigorous standards that provide comparability. It is Solvay's aim to apply the rigor of financial reporting to sustainability statements, which is why we fully support the Global Reporting Initiative (GRI).

To allow comparison with financial reporting, we publish our sustainability performance in two distinctive documents. In the first, the annual report, we share our sustainable development approach, offering concrete testimonials and highlighting our main indicators. In this second, complementary report, we detail our sustainability performance reporting, providing in-depth information in line with our stakeholder's expectation. Thus, this report is published in accordance with the Core option of the GRI. It serves also as a progress report on Solvay's implementation of the ten principles of the United Nations Global Compact.

You will find in this report the result of the strong involvement of our employees in Solvay Way, the Group's sustainability approach. The first chapter provides a strategic view of our corporate social identity. The Solvay Way approach and the evolution of our sustainable portfolio management demonstrates the link between our strategy and our commitment to create sustainable value for each of our stakeholders. The next chapters detail our extra-financial performance in economic, environmental and social aspects.

Clearer understanding of the performance of our CSR Group is our will and purpose of this report.

Jacques Kheliff  
Group General Manager  
Sustainable Development

## GRI Content Index

G4-32

Solvay supports the Global Reporting Initiative (G4) as a best practice standards and international guidelines for the sustainability reporting. This report is published in accordance with the GRI guidelines of the Core option. As GRI Organizational Stakeholder, Solvay contributes to the GRI's mission and is committed to advancing sustainability reporting. The table below describes the link between the Solvay's GRI Annual Report, the Annual Report, the United Nations Global Compact Principles and the G4, the latest version of the GRI Framework. Under the GRI Content Index Service, the GRI has verified the accuracy of the GRI Content Index of this report.



### General Standard Disclosures

General Standard Disclosures	In this Report	In the Annual Report	External Assurance	Title	Perimeter	UNGC Principles & Criteria
------------------------------	----------------	----------------------	--------------------	-------	-----------	----------------------------

#### Strategy and analysis

<b>G4-1</b>	pp. 1 ; 25	-	-	Statement from the most senior decision-maker of the organisation about relevance of sustainability to the organisation and its strategy	F	19
<b>G4-2</b>	pp. 18; 22	-	-	Description of key impacts, risks and opportunities	F	19

#### Identified material aspects and boundaries

<b>G4-3</b>	p. 107	-	-	Company name	F	-
<b>G4-4</b>	-	pp. 7-14	-	Principal brands, products, and services	F	-
<b>G4-5</b>	p. 107	-	-	Location of headquarter	F	-
<b>G4-6</b>	-	pp. 200-208	-	Countries where the company is established	F	-
<b>G4-7</b>	-	p. 47	-	Nature of ownership and legal form	F	-
<b>G4-8</b>	-	pp. 7-14	-	Markets served with geographic breakdown	F	-
<b>G4-9</b>	-	pp. 1 ; 47	-	Scale of the organization	F	-
<b>G4-10</b>	p. 26	-	-	Employment by contract type, worktime and gender	F	Principle 6
<b>G4-11</b>	p. 29	-	Yes. See pp. 16-17	Percentage of employees covered by collective bargaining agreements	F	Principle 3
<b>G4-12</b>	p. 29	-	-	Organization's supply chain	F	-
<b>G4-13</b>	p. 33	-	-	Significant changes in the reporting period	F	-
<b>G4-14</b>	p. 50	-	-	Position regarding the precautionary principle and its application	F	-
<b>G4-15</b>	p. 25	-	-	Adherence to charters, principles and other external initiatives	F	-
<b>G4-16</b>	p. 25	-	-	Membership of associations, including trade bodies	F	-

#### Identified material aspects and boundaries

<b>G4-17</b>	p. 33	-	-	All entities included in the organization's consolidated statements	F	-
<b>G4-18</b>	p. 33	-	-	Process for defining report content, aspect boundaries and GRI principles	-	-

General Standard Disclosures	In this Report	In the Annual Report	External Assurance	Title	Perimeter	UNGC Principles & Criteria
<b>G4-19</b>	p. 33	-	-	Material Aspects identified in the process for defining report content	-	-
<b>G4-20</b>	p. 33	-	-	Boundaries of material aspect within the organization	0	-
<b>G4-21</b>	p. 33	-	-	Boundaries of material aspect outside the organization	0	-
<b>G4-22</b>	p. 33	-	-	Explanation of the consequences of any changes in the boundaries of the report	-	-
<b>G4-23</b>	p. 33	-	-	Consequences of the changes in the scope and aspect in boundaries	-	-

## Stakeholder engagement

<b>G4-24</b>	p. 35	-	-	Stakeholders group considered	0	21
<b>G4-25</b>	p. 35	-	-	Basis for identification of stakeholders	0	21
<b>G4-26</b>	p. 35	-	-	Approaches to dialogue with the stakeholders	0	21
<b>G4-27</b>	p. 35	-	-	Stakeholders' concerns	0	21

## Report profile

<b>G4-28</b>	2014	2014	-	Reporting period for the information provided	-	-
<b>G4-29</b>	2013	2013	-	Date of most recent previous report	-	-
<b>G4-30</b>	Annual	Annual	-	Reporting cycle	-	-
<b>G4-31</b>	p. 107	-	-	Contact persons	-	-
<b>G4-32</b>	pp. 2 ; 16	-	-	Table identifying the location of the Standard disclosures in the report and External Assurance report	-	-
<b>G4-33</b>	p. 16	-	-	External validation	-	-

## Governance

<b>G4-34</b>	-	pp. 21-23	-	Governance structure	-	1 and 20
<b>G4-35</b>	p. 20	-	-	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees.	-	1 and 20
<b>G4-36</b>	p. 20	-	-	The positions with responsibility for economic, environmental and social topics report directly to the highest governance body.	-	1 and 20
<b>G4-38</b>	-	pp. 21-23	-	Composition of the highest governance body and its committees	-	1 and 20
<b>G4-40</b>	-	pp. 53-57 ; 59	-	Nomination and selection processes for the highest governance body and its committees	-	1 and 20
<b>G4-41</b>	-	pp. 53-57 ; 59	-	Processes for the highest governance body to ensure conflicts of interest are avoided and managed.	-	1, 2 and 20
<b>G4-43</b>	p. 20	-	-	The measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics.	-	1 and 20
<b>G4-44</b>	p. 20	-	-	Evaluation of the highest governance body's performance with respect to governance of economic environmental and social topics	-	1 and 20
<b>G4-45</b>	p. 20	-	-	The highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities.	-	1 and 20
<b>G4-47</b>	p. 20	-	-	The frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities.	-	1 and 20
<b>G4-48</b>	p. 20	-	-	The highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material Aspects are covered.	-	1 and 20
<b>G4-51</b>	-	pp. 73-74	-	The remuneration policies for the highest governance body and senior executives	-	1 and 20
<b>G4-52</b>	-	pp. 73-74	-	The process for determining remuneration	-	1 and 20



General Standard Disclosures	In this Report	In the Annual Report	External Assurance	Title	Perimeter	UNGC Principles & Criteria
------------------------------	----------------	----------------------	--------------------	-------	-----------	----------------------------

## Ethics and integrity

<b>G4-56</b>	p. 39	-	-	Organization's values principles, standards and norms of behavior such as codes of conduct and code of ethics	<b>0</b>	<b>Principle 10</b>
<b>G4-57</b>	p. 39	-	-	Internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity such as helplines or advices lines.	<b>0</b>	<b>Principle 11</b>
<b>G4-58</b>	p. 39	-	-	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.	<b>0</b>	<b>Principle 12</b>

## Specific Standard Disclosures

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

## Economic

### Economic performance

<b>G4-DMA</b>	p. 1	-	-	-	Generic Disclosures on Management Approach	<b>F</b>	-
<b>G4-EC1</b>	p. 46	-	-	-	Direct economic value generated and distributed	<b>F</b>	-
<b>G4-EC2</b>	-	p. 83	-	-	Financial implications, risks and opportunities due to climate change	<b>F</b>	<b>Principle 7</b>
<b>G4-EC3</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EC3 at corporate level because it is reported at local level.	-	Coverage of the organization's defined benefit plan obligations	-	-
<b>G4-EC4</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EC4 at corporate level because it is reported at local level.	-	Financial assistance received from government	-	-

## Specific Standard Disclosures

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

### Environmental

#### Materials

<b>G4-DMA</b>	p. 51	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN1</b>	p. 51	-	-	-	Materials used by Weight or volume	F	Principle 7 and 8
<b>G4-EN2</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN2 at corporate level because it is reported at local level.	-	Percentage of materials used that are recycled input materials	F	Principle 8

#### Energy

<b>G4-DMA</b>	p. 53	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN3</b>	p. 53	-	-	Yes. More details on pages 16-17	Energy consumption within the organization	F	Principle 7 and 8
<b>G4-EN4</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN4 because the priority is given to the consumption under our operational control.	-	Energy consumption outside of the organization	-	Principle 8
<b>G4-EN5</b>	p. 54	-	-	-	Energy Intensity	F	Principle 8
<b>G4-EN6</b>	p. 55	-	-	-	Reduction of energy Consumption	F	Principle 8 and 9
<b>G4-EN7</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN7 because the priority is given to the consumption under our operational control.	-	Reductions in energy requirements of products and services	-	Principle 8 and 9

#### Water

<b>G4-DMA</b>	p. 55	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN8</b>	p. 55	-	-	Yes. More details on pages 16-17	Total water withdrawal by source	F	Principle 7 and 8
<b>G4-EN9</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN9 because Solvay uses a water tool which gives a global assessment by river basin.	-	Water sources significantly affected by withdrawal of water	-	Principle 8
<b>G4-EN10</b>	p. 57	-	-	-	Percentage and total volume of water recycled and reused	F	Principle 8

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

## Biodiversity

<b>G4-DMA</b>	p. 57	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN11</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN11 at corporate level because it is reported at local level.	-	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	-	Principle 8
<b>G4-EN12</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN12 at corporate level because it is reported at local level.	-	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	F	Principle 8
<b>G4-EN13</b>	p. 58	-	-	-	Habitats protected or restored	F	Principle 8
<b>G4-EN14</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN14 at corporate level because it is reported at local level.	-	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

## Emissions

<b>G4-DMA</b>	p. 58	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN15</b>	p. 59	-	-	Yes. More details on pages 16-17	Direct Greenhouse Gas Emissions (Scope 1)	F	Principle 7 and 8
<b>G4-EN16</b>	p. 59	-	-	Yes. More details on pages 16-17	Energy indirect Greenhouse Gas emissions (Scope 2)	F	Principle 7 and 8
<b>G4-EN17</b>	p. 60	-	-	-	Other indirect greenhouse gas (GHG) emissions (Scope 3)	F	Principle 7 and 8
<b>G4-EN18</b>	p. 60	-	-	-	Greenhouse Gas Emissions Intensity	F	Principle 8
<b>G4-EN19</b>	p. 60	-	-	-	Reduction of Greenhouse Gas Emissions	F	Principle 8 and 9
<b>G4-EN20</b>	p. 61	-	-	Yes. More details on pages 16-17	Emissions of ozone-depleting Substance (ODS)	F	Principle 7 and 8
<b>G4-EN21</b>	p. 62	-	-	Yes. More details on pages 16-17	NOx, SOx, And other significant air emissions	F	Principle 7 and 8

## Effluents and waste

<b>G4-DMA</b>	p. 64	-	-	-	Generic Disclosures on Management Approach	F	Principle 7 and 8
<b>G4-EN22</b>	p. 64	-	-	Yes. More details on pages 16-17	Total water discharge by quality and by destination	F	Principle 8
<b>G4-EN23</b>	p. 66	-	-	Yes. More details on pages 16-17	Total weight of waste by type and disposal method	F	Principle 8
<b>G4-EN24</b>	p. 67	-	-	-	Total number and volume of significant spills	-	Principle 8



DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
<b>G4-EN25</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN25 at corporate level because it is reported at local level.	-	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	-	<b>Principle 8</b>
<b>G4-EN26</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-EN26 at corporate level because it is reported at local level.	-	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff	-	<b>Principle 8</b>

## Products and services

<b>G4-DMA</b>	<b>p. 69</b>	-	-	-	Generic Disclosures on Management Approach	<b>0</b>	<b>Principle 7, 8 and 9</b>
<b>G4-EN27</b>	<b>p.70</b>	-	-	-	Extent of impact mitigation of environmental impacts and services	<b>0</b>	<b>Principle 7, 8 and 9</b>
<b>G4-EN28</b>	<b>p.70</b>	-	-	-	Percentage of products sold and their packaging materials that are reclaimed by category	<b>0</b>	<b>Principle 8</b>

## Transport

<b>G4-DMA</b>	<b>p.71</b>	-	-	-	Generic Disclosures on Management Approach	<b>0</b>	<b>Principle 8</b>
<b>G4-EN30</b>	<b>p.71</b>	-	-	-	Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce	<b>0</b>	<b>Principle 8</b>

## Overall

<b>G4-DMA</b>	<b>p. 50</b>	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-EN31</b>	-	-	The indicator G4-EN31 is currently unavailable. Data is currently not aggregated in our reporting systems. New reporting systems are being put in place following the Rhodia acquisition in 2011. We expect to be able to aggregate this data in a year or two.	-	Total environmental protection expenditures and investments by type	-	<b>Principle 7, 8 and 9</b>

## Supplier environmental assessment

<b>G4-DMA</b>	<b>p. 29</b>	-	-	-	Generic Disclosures on Management Approach	<b>0</b>	<b>Principle 8</b>
<b>G4-EN32</b>	<b>p. 29</b>	-	-	-	Percentage of new suppliers that were screened using environmental criteria	<b>0</b>	<b>Principle 8</b>
<b>G4-EN33</b>	<b>p. 29</b>	-	-	-	Significant actual and potential negative environmental impacts in the supply chain and actions taken	-	<b>Principle 8</b>

## Specific Standard Disclosures

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

### Social

#### Labor practices and decent work

##### Employment

<b>G4-DMA</b>	p. 76	-	-	-	Generic Disclosures on Management Approach	<b>F</b>	
<b>G4-LA1</b>	p. 76	-	-	Yes. See more details on pages 16-17	Total number and rates of new employee hires and employee turnover by age group, gender and region	<b>F</b>	<b>Principle 6</b>
<b>G4-LA2</b>	p. 78	-	-	-	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	-	
<b>G4-LA3</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-LA3 at corporate level because it is reported at local level.	-	Return to work and retention rates after parental leave, by gender	-	<b>Principle 6</b>

##### Labor / management relations

<b>G4-DMA</b>	p. 79	-	-	-	Generic Disclosures on Management Approach	<b>F</b>	
<b>G4-LA4</b>	p. 79	-	-	-	Minimum notice periods regarding operational changes, including whether these are specified in collective agreements	<b>F</b>	<b>Principle 3</b>

##### Occupational health and safety

<b>G4-DMA</b>	p. 79	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-LA5</b>	-	-	Not applicable. Solvay doesn't report the indicator G4-LA5 at corporate level because it is reported at local level.	-	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	-	-
<b>G4-LA6</b>	p. 80	-	-	Yes. See more details on pages 16-17	Rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	<b>0</b>	-
<b>G4-LA7</b>	p. 83	-	-	-	Workers with high incidence or high risk of diseases related to their occupation	<b>0</b>	-
<b>G4-LA8</b>	p. 84	-	-	-	Health and safety topics covered in formal agreements with trade unions	<b>0</b>	-

##### Training and education

<b>G4-DMA</b>	p. 84	-	-	-	Generic Disclosures on Management Approach		
<b>G4-LA9</b>	p. 84	-	-	Yes. See more details on pages 16-17	Average hours of training per year per employee by gender, and by employee category	<b>0</b>	<b>Principle 6</b>
<b>G4-LA10</b>	p. 85	-	-	-	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	<b>0</b>	
<b>G4-LA11</b>	p. 86	-	-	-	Percentage of employees receiving regular performance and career development reviews, by gender and by employee category	<b>0</b>	<b>Principle 6</b>

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

### *Diversity and equal opportunity*

<b>G4-DMA</b>	p. 87	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-LA12</b>	p. 87	-	-	Yes. See more details on pages 16-17	Indicator of diversity	0	<b>Principle 6</b>

### *Equal remuneration for women and men*

<b>G4-DMA</b>	p. 88	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-LA13</b>	p. 88	-	-	-	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	-	<b>Principle 6</b>

### *Supplier assessment for labor practices*

<b>G4-DMA</b>	p. 29	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-LA14</b>	p. 29	-	-	-	Percentage of new suppliers that were screened using labor practices criteria	0	-
<b>G4-LA15</b>	p. 29	-	-	-	Significant actual and potential negative impacts for labor practices in the supply chain and actions taken	-	-

### *Human rights*

#### *Investment*

<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-HR1</b>	-	-	The indicator G4-HR1 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Total number and percentage of significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	-	<b>Principle 2</b>
<b>G4-HR2</b>	-	-	The indicator G4-HR2 is currently unavailable. A new code of conduct has been launched in 2014; we expect to report training hours next year.	-	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	-	<b>Principle 1</b>

#### *Non-discrimination*

<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-HR3</b>	-	-	The indicator G4-HR3 is currently unavailable because a new reporting systems are being put in place. We expect to be able to report in a year or two.	-	Total number of incidents of discrimination and corrective actions taken	-	-

### *Freedom of association and collective bargaining*

<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	0	<b>Criteria 3 to 5</b>
<b>G4-HR4</b>	-	-	The indicator G4-HR4 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	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	<b>Principle 3</b>

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
<b>Child labor</b>							
<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	<b>Principle 5</b>
<b>G4-HR5</b>	-	-	The indicator G4-HR5 is not applicable because Solvay prohibits any kind of child labor in its supplier code of conduct.	-	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	-	<b>Principle 5</b>
<b>Forced or compulsory labor</b>							
<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	<b>Principle 4</b>
<b>G4-HR6</b>	-	-	The indicator G4-HR6 is not applicable because Solvay prohibits any kind of forced labor in its supplier code of conduct.	-	Operations and suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures taken to contribute to the elimination of all forms of forced or compulsory labor	-	<b>Principle 4</b>
<b>Security practices</b>							
<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-HR7</b>	-	-	The indicator G4-HR7 is currently unavailable. A new code of conduct has been launched in 2014 to all employee, including the security personnel. We expect to report the indicator G4-HR7 next year.	-	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations	0	<b>Principle 1</b>
<b>Indigenous rights</b>							
<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-HR8</b>	-	-	The indicator G4-HR8 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Total number and percentage of operations that have been subject to human rights reviews or impact assessments	-	<b>Principle 1</b>
<b>Assessment</b>							
<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-HR9</b>	-	-	The indicator G4-HR9 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Total number of incidents of violations involving rights of indigenous peoples and actions taken	-	<b>Principle 1</b>
<b>Supplier human rights assessment</b>							
<b>G4-DMA</b>	p. 29	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 3 to 5</b>
<b>G4-HR10</b>	p. 29	-	-	-	Percentage of new suppliers that were screened using human rights criteria	0	<b>Principle 2</b>
<b>G4-HR11</b>	p. 29	-	-	-	Significant actual and potential negative human rights impacts in the supply chain and actions taken	-	<b>Principle 2</b>

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
--------------------	----------------	----------------------	-----------	--------------------	-------	-----------	----------------------------

### Human rights grievance mechanisms

<b>G4-DMA</b>	p. 89	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 3 to 5</b>
<b>G4-HR12</b>	-	-	The indicator G4-HR12 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Number of grievances about human rights impacts filed, addressed, and resolved through formal grievance mechanisms	-	<b>Principle 1</b>

### Society performance

#### Local communities

<b>G4-DMA</b>	p. 90	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 12 to 14</b>
<b>G4-S01</b>	p. 91	-	-	-	Percentage of operations with implemented local community engagement, impact assessments, and development programs	0	<b>Principle 1</b>
<b>G4-S02</b>	p. 94	-	-	-	Operations with significant actual or potential negative impacts on local communities	0	<b>Principle 1</b>

#### Anti-corruption

<b>G4-DMA</b>	p. 95	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 12 to 14</b>
<b>G4-S03</b>	-	p. 75	-	-	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	-	<b>Principle 10</b>
<b>G4-S04</b>	p. 96	-	-	-	Communication and training on anti-corruption policies and procedures	0	<b>Principle 10</b>
<b>G4-S05</b>	-	-	The indicator G4-S05 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Confirmed incidents of corruption and actions taken	-	<b>Principle 10</b>

#### Public policy

<b>G4-DMA</b>	p. 96	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 12 to 14</b>
<b>G4-S06</b>	-	-	The indicator G4-S06 is not applicable because Solvay does not take part in party political activities nor does it make corporate donations to political parties or candidates.	-	Total value of political contributions by country and recipient/beneficiary	-	<b>Principle 10</b>

#### Anti-competitive Behavior

<b>G4-DMA</b>	p. 97	-	-	-	Generic Disclosures on Management Approach	-	<b>Criteria 12 to 14</b>
<b>G4-S07</b>	-	-	The indicator G4-S07 is currently unavailable. New reporting systems are being put in place. We expect to be able to report in a year or two.	-	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	0	

DMA and Indicators	In this Report	In the Annual Report	Omissions	External Assurance	Title	Perimeter	UNGC Principles & Criteria
<b>Compliance</b>							
<b>G4-DMA</b>	p. 97	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-S08</b>	p. 97	-	-	-	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations	0	-
<b>Supplier assessment for impacts on Society</b>							
<b>G4-DMA</b>	p. 29	-	-	-	Generic Disclosures on Management Approach	-	Criteria 12 to 14
<b>G4-S09</b>	p. 29	-	-	-	Percentage of new suppliers that were screened using criteria for impacts on society	0	
<b>G4-S010</b>	p. 29	-	-	-	Significant actual and potential negative impacts on society in the supply chain and actions taken	-	
<b>Grievance mechanisms for impacts on society</b>							
<b>G4-DMA</b>	p. 97	-	-	-	Generic Disclosures on Management Approach	-	Criteria 12 to 14
<b>G4-S011</b>	p. 97	-	-	-	Number of grievances about impacts on society filed, addressed, and resolved through formal grievance mechanisms	0	
<b>Product responsibility</b>							
<b>Customer health and safety</b>							
<b>G4-DMA</b>	p. 100	-	-	-	Generic Disclosures on Management Approach	-	-
<b>G4-PR1</b>	p. 101	-	-	-	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	-	-
<b>G4-PR2</b>	-	-	The indicator G4-PR2 is not available because Solvay report it at local level and there is no worldwide indicator.	-	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	-	-
<b>Product and service labeling</b>							
<b>G4-DMA</b>	p. 102	-	-	-	-	-	-
<b>G4-PR3</b>	p. 102	-	-	-	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	-	-
<b>G4-PR4</b>	-	-	The indicator G4-PR4 is not applicable because Solvay has no worldwide indicator but a centralized system for systematic regulatory monitoring which informs business managers about key regulatory changes.	-	Number of incidents of non-compliance with regulation	-	-
<b>G4-PR5</b>	p. 104	-	-	-	Results of surveys measuring customer satisfaction	-	-



## Additional non-GRI Disclosure

	In this Report	Perimeter
<b>1. Economic performance</b>		
Human capital return on investment	p. 46	F
<b>2. Research and Innovation management</b>		
Sustainable innovation highlights in 2014	pp. 42-43	F
Open innovation	pp. 43-45	F
Innovation main figures	pp. 45-46	F
<b>3. Environmental soil management</b>	p. 68	F
<b>4. Local communities</b>		
Awards and recognition	pp. 92-94	O







# 3.


# Sustainability statement

<b>1. External assurance</b>	<b>16</b>
<b>2. Strategy and analysis</b>	<b>18</b>
2.1. Solvay Way's approach and management	18
2.2. Sustainable Portfolio Management	22
<b>3. Organizational profile</b>	<b>25</b>
3.1. Commitments to external initiatives	25
3.2. Structure of employment	26
3.3. Supply chain management	29
<b>4. Identified material aspects and boundaries</b>	<b>33</b>
4.1. Social and environmental consolidation scope	33
4.2. Material aspects identified in the process for defining report content	33
<b>5. Stakeholder engagement</b>	<b>35</b>
5.1. Solvay Way's commitments towards stakeholders	35
5.2. Performance recognized in extra-financial ratings	38
<b>6. Ethics and integrity</b>	<b>39</b>

## 1. External assurance

G4-32 / G4-33


### **Limited assurance report of the Statutory Auditor on a selection of social, environmental and other sustainable development information for the year ended 31 December 2014**

Pursuant to your request and in our capacity of Statutory Auditor of Solvay SA/NV, we hereby present you our limited assurance report on a selection of social, environmental and other sustainable development information disclosed in sections “3. Sustainability Statement”, “4. Environment”, “5. Social” of Solvay Group GRI Annual Report for the year ended 31 December 2014 (the “GRI Annual Report”), identified by the symbol .

#### **Responsibility of the Company**


This selection of information (the “Information”) extracted from the GRI Annual Report 2014 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 the GRI Annual 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 GRI Annual 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) 3000<sup>(1)</sup>. 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 GRI Annual 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.


---

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

We performed the following procedures:

- We have 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 Information<sup>(2)</sup>:
  - 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 selected<sup>(3)</sup> 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.

## Conclusion

On the basis of the procedures performed by us, nothing came to our attention that causes us to believe that the Information identified by the symbol  2014 as included in Solvay Group GRI Annual Report for the year ended 31 December 2014, is not prepared, in all material respects, in accordance with the Reporting Framework.

Diegem, 14 April 2015

The Statutory Auditor



DELOITTE Bedrijfsrevisoren / Reviseurs d'Entreprises

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

Represented by Eric Nys

(2) **Social information:** Employment by region (FTE) and Total Headcount, Employment by level, Employment by age range, Hirings per region, Percentage of women per management level, Percentage of female employees (total headcount), Accident frequency rate – Lost Time Accident Rate (LTAR) – employees, contractors and temporary workers, Accident frequency rate – Medical Treatment Accident Rate (MTAR) – employees, contractors and temporary workers, Number of fatal accidents, Average hours of training per year per employee.

**Environmental information:** Energy consumption, Groundwater + drinking water, Intake of estuary and sea water, Intake of surface water, Intake of groundwater, Water intake from auxiliary sources, Total water intake, Direct CO<sub>2</sub> emissions (scope 1), Other greenhouse gases (Kyoto Protocol) emissions (scope 1), Total greenhouse gases (Kyoto Protocol) emissions, Indirect CO<sub>2</sub> emissions (scope 2), Ozone-depleting substances, Acidification, Photochemical oxidant formation, NO<sub>x</sub>, SO<sub>x</sub>, Non Methanolic Volatile Organic Compounds (NMVOC), Particulates, Chemical Oxygen Demand, Nitrogen total, Phosphorus total, Heavy metals, Total industrial hazardous waste, Total industrial non-hazardous waste, Landfilled hazardous industrial waste.

**Process safety information:** % level 1 risk situations solved within one year, Number of “risk level 1” situations at the end of the year

**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 Water scarcity:** Number of sites for which the water scarcity risk was confirmed, number of sites having implemented a sustainable water management

**Information related to Management of substances potentially of concern:** % of SVHC reviewed for potential substitution

**Information related to Soil management:** Environmental provisions

**Information related to Employee representation indicator:** % of employees covered by collective agreement

**Information related to Solvay Way:** Solvay Way Profile of the Group in 2014 (2014 results)

(3) Alexandria (Egypt), Bernburg (Germany), Brotas (Brazil), Devnya (Bulgaria), Panoli (India), Rheinberg (Germany), St-Fons (France), Chalampé (France) for industrial hazardous waste and groundwater intake only, Orange (USA) for CFC113 and R22 emissions only, Rosignano (Italia) for seawater intake only, Santo-Andre (Brazil) for Acetone emissions only, Spinetta-Marengo (Italia) for CF<sub>4</sub> and R22 emissions only

## 2. Strategy and analysis



G4-2

Solvay's culture of responsibility is part of its historical identity base. The Group pioneered many initiatives 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 within 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).

### 2.1. Solvay Way's approach and management

The Solvay Way is the sustainability approach of the Group. It integrates social, societal, environmental and economic aspects into the Company's management and strategy, with the objective of creating value. It takes into account society's changing expectations, requiring industry to develop technologies, processes, products, applications and services in line with the objectives of sustainable development.

Solvay's commitment to sustainable development and social responsibility applies to all lifecycle stages of its products – including design, manufacturing, product applications, end-of-life and use of resources – and the social consequences of their manufacture or use.

Solvay develops and maintains permanent dialogue with its stakeholders, and their representatives, on issues of sustainable development. The discussions are based on the will to innovate and move forward together as well as to develop specific partnerships. Contracts are prepared, negotiated and executed by Solvay to reflect the Group's sustainable development policy. Solvay Way practices are reviewed each year by external partners and the Sustainable Development Function implements the findings and conclusions to achieve progress.

Regarding business portfolio management, Solvay Way integrates a specific tool: Sustainable Portfolio management (SPM). Developed by Solvay with Arthur D. Little and the Dutch organization for Technological Research TNO, SPM assesses the sustainability and the potential impacts of Solvay's product and market portfolio.

For more details about SPM, the reader is referred on page 22.



**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 scarcity risk



**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 work accidents 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



**Sustainable Portfolio Management (SPM)**  
**20%**  
of our turnover in the "Star" category according to the SPM assessment  
  
**80%**  
of our R&I budget allocated to sustainable projects (SPM "improved", "star" and "aligned" categories)



**Learning & development**  
Ensuring  
**1**  
week of training per employee and per year  
  
Training  
**100%**  
of our employees to the Solvay Way reference framework

\* Base 2012, at constant activity perimeter.

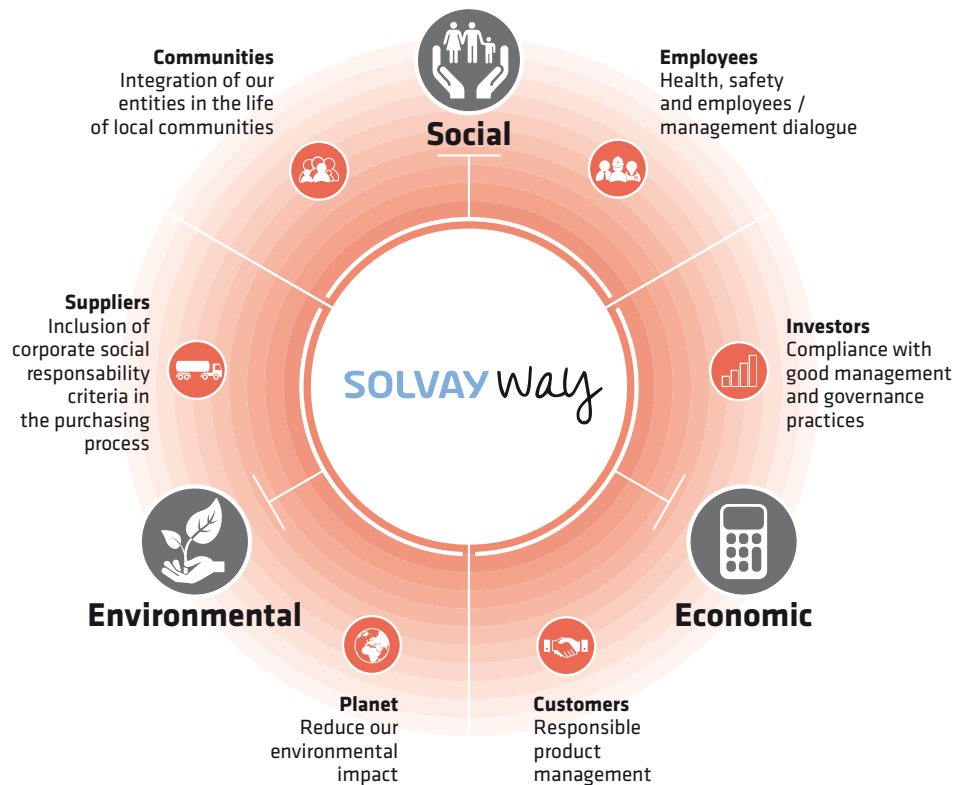
"At constant activity perimeter" means that the absolute performance is corrected for changes in production volumes and for sites entering or leaving the Group perimeter.



## Solvay Way, driving improvement

The Solvay group commits to continuous improvement regarding Corporate Social Responsibility. Its commitments and objectives are reviewed based on progress, evolution of standards and needs of stakeholders, lessons learned from self-assessments, internal and external audits and exchanges of best practices.

Solvay Way is based on a reference framework towards six stakeholders (customers, employees, investors, suppliers, communities and the planet), to whom the Group has made 22 commitments declined in 49 associated practices. This reference framework helps each Solvay entity conduct yearly self-assessments of its practices in order to identify its strengths and weaknesses, and develop an appropriate improvement plan.



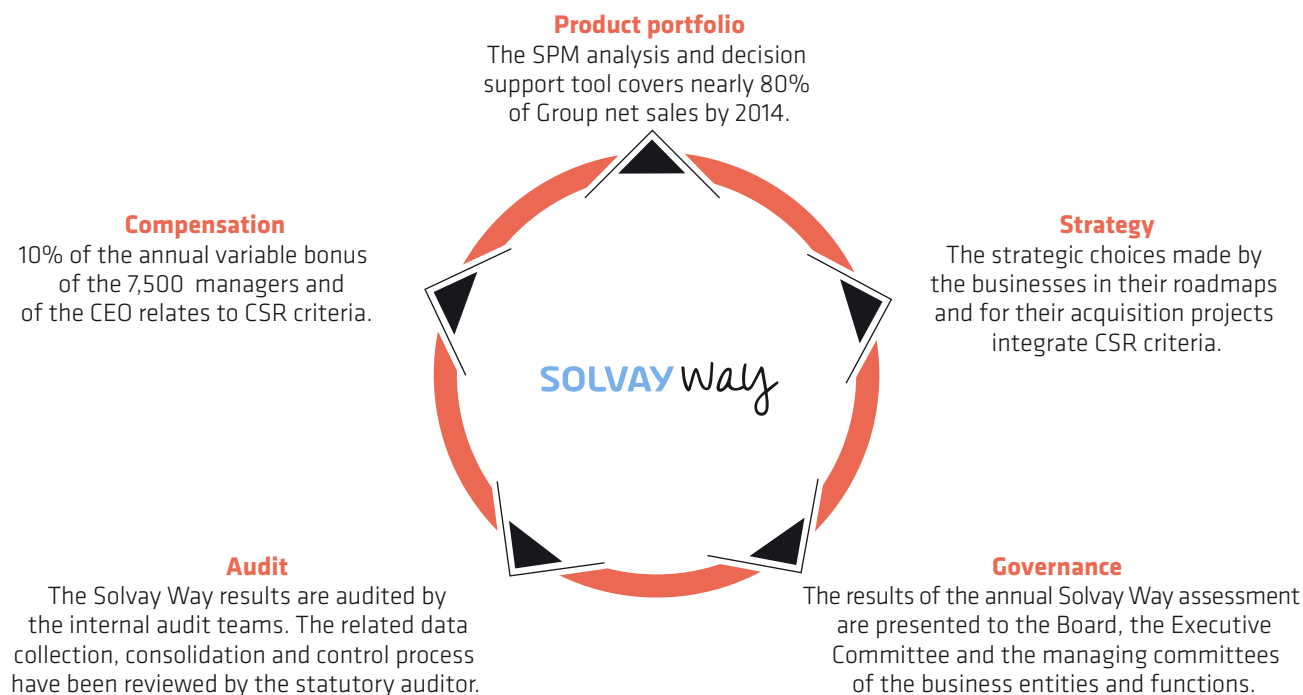
Each year, all Solvay production sites, business units and research centers, purchasing, finance, legal, public affairs, strategy and human resources Departments assess their practices in terms of corporate social responsibility. The objective for each entity is to identify its progress toward stakeholders in terms of Solvay Way commitments. They can hence define action plans to improve their processes and practices.

### Solvay Way, integrated in the management processes



G4-34 / G4-35 / G4-36 / G4-43 / G4-44 / G4-45 / G4-47 / G4-48

To ensure rapid progress, the Group has integrated the goals of a more sustainable development into all its managerial processes. This is the best approach to ensure the commitment of every employee to fulfill the Group's commitment at every stage of the business cycle and in all stakeholder relationships.



### A global network for an active deployment

Coordinated by the Sustainable Development Function, the Solvay Way is monitored by a global network of more than 200 "champions" and "correspondents" who ensure its active deployment within the GBU or Functions. The Sustainable Development Function keeps the overall view of the expectations of the different stakeholders and is responsible for supervising the approach on behalf of the Group. It coordinates the work of this network and reports directly to the CEO.

The Champions and correspondents play key roles in Solvay Way. They ensure the deployment of the process by mobilising their colleagues around precise objectives and by setting action plans.

Each entity is responsible for the implementation of Solvay Way within its organization. The annual self-assessment of its practices, using the Solvay Way analysis grid and scoring system, enables the entity to measure the progress achieved and to adjust its improvement plan. The Sustainable Development Function consolidates this assessment data and presents the results to the Executive Committee.

### 2014 Solvay Way Profile

Deployed in 2013, Solvay Way has been rapidly appropriated by employees. The number of the involved personnel grew significantly from 10 to 30%. For the second time, all Solvay entities assessed their social and environmental responsibility practices.

More than 30% of the employees were involved in an action plan in order to improve the Solvay Way profile. This demonstrates that Solvay's sustainability approach is increasingly applied by the business

units, the functions, all the industrial sites and all the research and innovation laboratories. The strong employee's involvement shows their appropriation of the culture of responsibility carried by Solvay Way.

The 2014 Solvay Way framework has been updated in order to reinforce its commitments in the following domains :

- Industrial hygiene, health and product stewardship dealing with Safety Data Sheet and Substance of Very High Concern's (SVHC) and well-being at work;
- Diversity as a performance driver;
- Innovations and investments while integrating corporate social responsibility criteria;
- Material indicators in order to measure a responsible value creation.

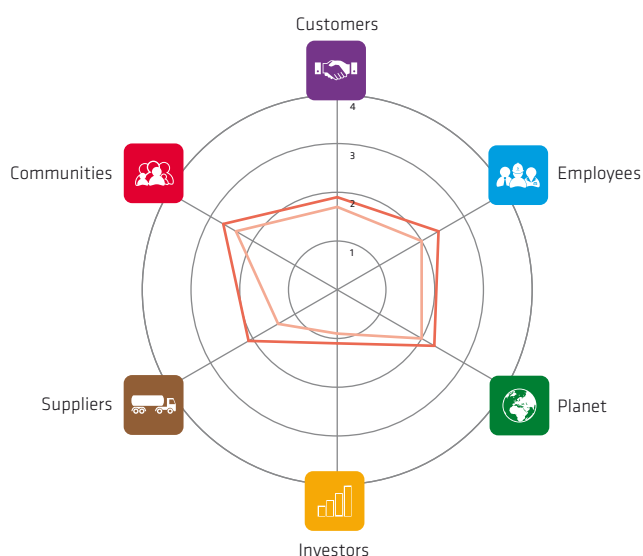
Each Solvay Way's practice is structured on four scale level:

- 1. Launch:** the entity is essentially responsive to the expectations of stakeholders. An inventory is conducted;
- 2. Deployment:** the entity implements a structured, internal progress dynamic with stakeholders. Methods are used to set priorities. Resources are deployed and managers are mobilized in action plans;
- 3. Maturity:** action plans bring measurable progresses. Their implementation is carried out and audited throughout perimeter with lessons learned detailed; employees are mobilized in the deployment;
- 4. Performance:** the entity is close to the benchmark of the profession. The improvement process is sustainable, the results are sustainable. The entity is recognized for its exemplary performance. All stakeholders adhere to the approach.

The 2014 results are compared to 2013, taking into account the modifications as described above, i.e not considering the 8 practices (on 49) that have been significantly changed.

The following Solvay Way spider report gives a global view of the Solvay's progress in terms of sustainability towards its stakeholders.

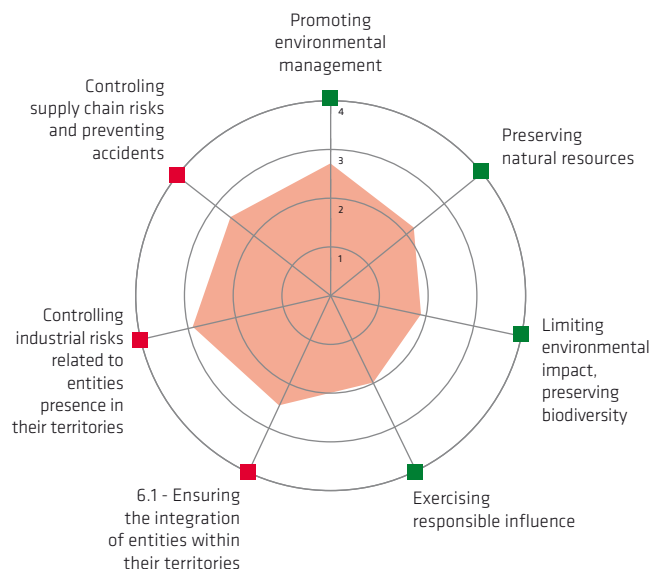
### → Solvay Way Profile of the Group in 2014



## Planet / Communities



- All environmental management practices and industrial risks practices are still at a maturity level;
- The SOLWATT® methodology is increasingly applied for energy efficiency.



## Customers / Suppliers



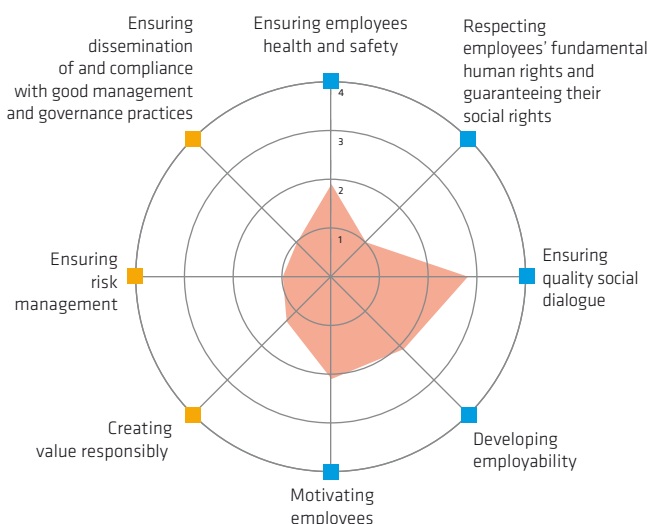
- Improvements have been made to better know the customers' corporate social responsibility expectations;
- SPM have been deployed in all Global Business Units;
- Global Business Units have progressed in identifying the corporate social responsibility prerequisites and applied these requirements in the process of selecting the key suppliers.



## Employees / Investors



- Preventing occupational accidents still at a maturity level;
- A CSR remuneration to all employees has been proposed to the Executive Committee;
- The new CSR agreement with IndustriALL Global Union has been disseminated in all sites;
- Material Indicators have been defined;
- Sustainable Development issues are now part of the due diligence process of the Merger & Acquisition process.



## 2.2. Sustainable Portfolio Management



G4-2

From a business perspective, Solvay sets itself the objective of progressively transforming its portfolio, notably by growing its revenue in sustainable solutions sought in the marketplace and therefore allocates the vast majority of its resources to even more sustainable developments (internal and external growths).

In order to deliver 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 (Sustainable Portfolio Management) methodology: systematically, robustly and rigorously developing the information that decision makers need when making their judgments, taking into account the sustainability megatrends that may positively or negatively affect Solvay's top and bottom lines.

### How the methodology works

The SPM methodology was designed in-house in 2009 and developed further with the support of two recognized consultancies, Arthur D. Little and TNO. It has been continuously improved since 2009 in order to make SPM evaluations at Product-Application Combinations (PACs) level more pertinent and reliable.

The operations vulnerability (vertical axis) 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, summed up and evaluated against the average sales price for that product in that application (the intent is to reflect sustainable development issues and not short-term market prices effects).

The market alignment (horizontal axis) 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, the consumers or the brand owners, demands.

The assessment is made at the Product-Application Combination (PAC) level, using a detailed and precise questionnaire and is supported by external authoritative evidences:

- **Star:** PAC for which there are no negative but positive signals, in line with sustainability trends in the marketplace, with anticipated double-digit growth;
- **Aligned:** PAC for which there are no negative but positive signals resulting from sustainability trends in the marketplace, without anticipated double-digit growth;
- **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;
- **Challenged:** PAC for which there are strong negative signals resulting from sustainability trends in the marketplace.

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 benefits below. If a sustainability roadblock is identified, then the Product Application Combination will be classified as "Challenged" or "Exposed".

### Essential living conditions

Climate change
Energy efficiency
Exposure to harmful and toxic substances
Resource efficiency
Fresh water
Renewable materials
Availability of food
Renewable energy
Biodegradability
Recyclability
Waste treatment
Minimizing use of scarce inputs

**Legend:** List of the SPM benefits.

### Living well

Medical care
Chronic diseases
Limitation of the effects of aging
Medical care at home
Water & air quality
Safety & prevention
Healthy nutrition
Healthy habits
Topical care

The above list has been set up by:

- identifying authoritative "think-tanks" on the subject: Rocky Mountain institute, World Watch Institute, WWF, Greenpeace, UNEP, Wuppertal Institute, WBCSD, International Institute for Sustainable Development, London School of Economics, Sierra Club, Öko Institut;
- comprehensively listing the sustainability topics that matter to them;
- selecting the topics for which a chemicals might be part of the solutions or the problems.

The list has continuously been improved over years to mirror the latest progresses in corporate social responsibility.

### Closely embedded in key Group processes

The SPM methodology is owned by the Corporate Sustainable Development Function and managed by a small team of experts. It thus serves as a strategic tool to develop the information that is required to anticipate the impacts of potential decisions on the sustainability profile of the Group:

- the SPM methodology is integrated into the Solvay Way framework and serves as a tool to measure maturity of organizations with regard to the integration of sustainability in business practices (three commitments and seven practices);

- the SPM profile is an integral part of the strategic discussions of each of the Global Business Units (GBUs) with the Executive Committee (Comex);
- decisions about investments (capital expenditure and acquisitions) taken by the Comex or the Board of Directors include a sustainability challenge that encompasses an exhaustive SPM analysis of the contemplated investment;
- the SPM work plan is discussed each year between each GBU and the Sustainable Development Function. Priorities and workloads are defined based on the results of the SPM evaluation of the previous year and including any new elements in the marketplace, 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, industrial, product stewardship, marketing and technical services.

#### Focus:

As an 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 mechanically stressed parts under the hood of an automobile in its hot air induction system (the application), thus reducing the weight of the car and thereby increasing its energy efficiency.

### Validation of the SPM analysis

An in-depth verification of the “Market Alignment” results covering 144 Product-Applications Combinations (PACs) is currently carried out by Arthur D. Little. To date, 69 PACs evaluations were confirmed by Arthur D. Little, 2 PACs were not confirmed and Solvay endorsed Arthur D. Little score. 73 PACs are still in revision process.

Until recently, Solvay kept the SPM methodology in-house. The Group now believes that there is significant value for other companies, in further improving the methodology through having it challenged by other companies, and in creating consistent benchmarks. Arthur D. Little is Solvay's partner in making the methodology available to interested parties.

### Assessment scope and planning – Product portfolio

The SPM tool has been deployed in Solvay legacy since 2010 and has been progressively deployed in Rhodia legacy since the Rhodia acquisition end 2011.

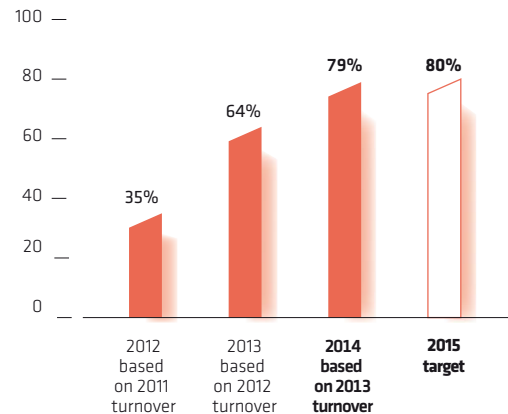


**By the end of 2014, 79% of the Solvay group's sales has been assessed from a market alignment perspective, which is ahead of schedule and quite close to the 2015 objective.**

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.

#### Sustainable Portfolio management

##### → Energy consumption



**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.

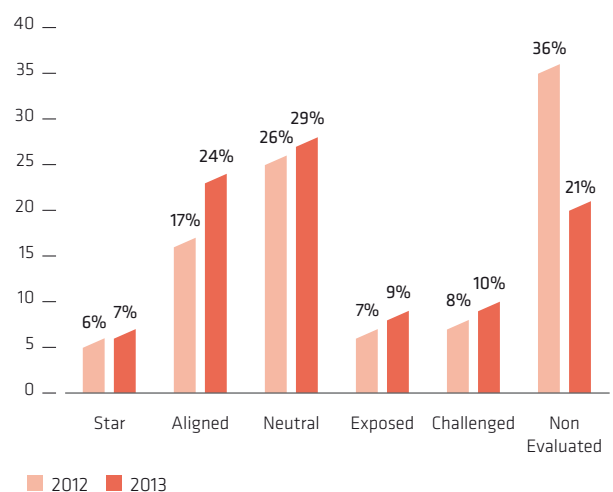
### Assessment results per category – Product portfolio

#### Solvay's 2020 target:

**to reach 20% of revenue with “Product-Application Combinations” in the “Star” category, i.e. in markets expected to experience double-digit growth for sustainability reasons.**

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.

#### Percentage of turnover per SPM category



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

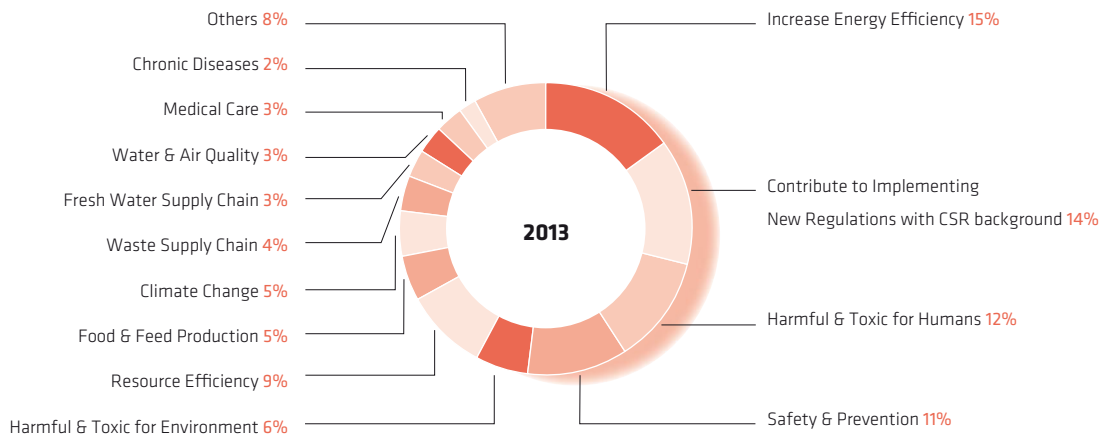
**Legend:** Breakdown of the Benefits behind the Aligned and Star PACs.



The assessed portfolio encompasses 24% of Product-Application Combinations in the “Aligned” category and 7% in the “Star” one, both in progress compared to previous year. Together, this 31% (up from 8% vs. previous year) of revenue represents “Product-Application Combinations” matching stakeholders sustainability expectations.

The share of the sales in SPM Star category is continuously increasing and we feel confident of delivering the ambitious 2020 objective.

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.



## 3. Organizational profile

### 3.1. Commitments to external initiatives



G4-15/G4-16

Solvay's corporate responsibility lies at the very heart of Solvay's identity: behaving internally and externally in a manner worthy of the Group's vocation, innovating and serving progress. Solvay stands with its employees ready to lead and to respond ethically and with integrity to the needs of its surrounding communities and society at large.



**“ Our support for the respect of the ten principles of the UN Global Compact G4-1**

*I am pleased to reaffirm Solvay's support for the ten principles of the UN Global Compact, all of which align with our Group's values and policies. Solvay is committed*

*to continue to advance those principles within its sphere of influence by incorporating the UN Global Compact and its principles within its strategy, culture and day-to-day operations.*

*Sustainability is at the heart of our vision. We want to be a role model for sustainable chemistry in the way we manufacture, do business and manage people, and by the product portfolio we offer to our customers.*

*The Global Compact is the only global initiative that takes into account all the aspects of sustainable development and is focused on continuous improvement. A key aspect is to conciliate the various sustainability goals and the interests of our stakeholders.*

*In this GRI Annual Report, we describe how Solvay has progressed in creating value for its stakeholders in full alignment with its commitment to corporate social responsibility and its code of conduct. ”*

**Jean-Pierre Clamadieu**  
Solvay Chief Executive Officer  
March 31<sup>st</sup>, 2014



**For the respect of human rights:** Solvay participates in the UN Global Compact and commits to its principles, hence contributing to the emergence of a sustainable and inclusive global economy which delivers lasting benefits to people, communities and markets.

Solvay is signatory to the UN Global Compact and supports the 10 principles with respect to human rights, labor, environment and anti-corruption:

1. Businesses should support and respect the protection of internationally proclaimed human rights;
2. Businesses should make sure that they are not complicit in human rights abuses;
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
4. Businesses should uphold the elimination of all forms of forced and compulsory labor;
5. Businesses should uphold the effective abolition of child labor;
6. Businesses should uphold the elimination of discrimination in respect of employment and occupation;
7. Businesses should support a precautionary approach to environmental challenges;
8. Businesses should undertake initiatives to promote greater environmental responsibility;
9. Businesses should encourage the development and diffusion of environmentally friendly technologies;
10. Businesses should work against corruption in all its forms, including extortion and bribery;

■ **For a global standard in sustainability:** Solvay uses the voluntary international standard ISO 26000 on social responsibility as a reference. This standard provides guidelines for organizations to operate in a socially responsible manner;



■ **For a responsible dialogue:** On December 17, 2013, Solvay signed a Corporate Social and Environmental Agreement for the whole Group with IndustriALL Global Union. This agreement, one of the first of its kind in the chemical industry, gives tangible expression to Solvay's determination to ensure that basic labor rights and 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. Every year, an assessment is carried out on a Solvay site to verify the correct application at a grassroots level of the commitments made by the Group, based on the International Labor Organization (ILO) standards and the principles of the United Nations Global Compact (UNGC). <http://www.solvay.com/en/sustainability/IndustriALL-agreement.html>. In order to cascade the IndustriALL Global Union Agreement to all employees, it has been integrated in the Solvay Way reference framework, as an employees practice, and each year its good deployment and understanding is evaluated through the Solvay Way assessment.

### Solvay commits to reinforced ICCA Responsible Care® Global Charter



In October 2014, Solvay signed up to the International Council of Chemical Association's new Responsible Care Global Charter, which reinforces the commitment of multinational chemical companies to continuously improve their health, safety and environmental (HSE) performance worldwide. Solvay has been a signatory to the original ICCA charter since its inception in 2007.

The new charter clarifies the role and responsibilities of global chemical players in implementing its HSE requirements on their sites (in order to protect staff and communities) and in product life-cycles (to benefit users, consumers and the environment). It also clarifies the safe management of manufacturing processes.

By recommitting to the new charter, Solvay shows its resolve to strengthen the Responsible Care® initiative across the globe and to further improve its own HSE performance in all of the countries where it does business, also in dialogue with communities, authorities and other stakeholders.

The charter will be launched at the International Conference on Chemicals Management in September 2015 in Geneva. With Jean-Pierre Clamadieu as sponsor of the ICCA's Responsible Care® Leadership Group and a member of the ICCA Board, Solvay played a key role in the revision of the Responsible Care® Global Charter.

Solvay has been developing and strengthening its Responsible Care® policy for more than 20 years now. It was reinforced in 2012 through eight new, well-defined policies in HSE, embedded throughout the Group. Responsible Care® is part of the Group's sustainability strategy "Solvay Way".



### World Business Council for Sustainable Development

Solvay is fully committed to the World Business Council for Sustainable Development (WBCSD), with Jean-Pierre Clamadieu, CEO of Solvay, now a member of WBCSD's Executive Committee, and co-chair of the Board of its energy and climate cluster. As an active member of WBCSD since 2009, Solvay is working with other chemical sector companies on sustainability metrics and barriers to sustainable solutions in the value chains. By analyzing them, together with other players in selected value chains (automotive, packaging, building), it should be possible to lift the barriers that prevent sustainable solutions from succeeding in the market. Solvay co-steered (with DSM) a guidance document for the chemical industry on life-cycle metrics for chemical products (published in 2014), following the guidelines on "Addressing the Avoided Emissions Challenge" (published in 2013). WBCSD's metrics projects share a common objective: to ensure consistent communication on how chemicals impact on, and contribute to, sustainability worldwide. ICCA, as well as CEFIC and UIC (the world, European and French chemical associations) also take part in and disseminate the output of WBCSD's chemical subgroup.

Another project, "Action2020", emerged from WBCSD's Vision 2050. The focus is on how business can positively contribute to tackling issues like climate change or deforestation by pushing "business solutions".

The main associations in which Solvay is involved are as follows:

- **WBCSD (World Business Council for Sustainable Development)** – In November 2014, Jean-Pierre Clamadieu joined the Executive Committee of WBCSD;
- **ICCA (International Council of Chemical Associations)** – With Jean-Pierre Clamadieu as sponsor of the ICCA's Responsible Care® Leadership Group and a member of the ICCA Board, Solvay played a key role in the revision of the Responsible Care® Global Charter;
- **BusinessEurope** – Participation in thematic working groups;
- **ERT (European Roundtable of Industrialists)** – Participation in thematic working groups. Solvay is chairing the Societal Changes WG;
- **CEFIC (European Chemical Industry Council)** – Participation in thematic WG. Since October 2014 and for the next two years Jean-Pierre Clamadieu will be president of CEFIC;
- **PE (PlasticsEurope)** – Participation in thematic working group;
- **ACC (American Chemistry Council)** – Participation in thematic working groups;
- **Bruegel think tank** – Solvay was a member until the end of 2014. The Manufacturing Europe study was financed in 2013;
- **Confrontations Europe** – Solvay was a member until the end of 2014.

## 3.2. Structure of employment

G4-10

In this section key data are given on the structure of the Group's employment base. In line with the GRI standards, they cover the employment by geographies, gender and type of work contract. Beyond this scope they expand on age structure, employment level and underlying considerations. This may provide the reader with additional insight into the way in which the Group's workforce is structured and how it manages its human capital.

### Employment by region

→ By region



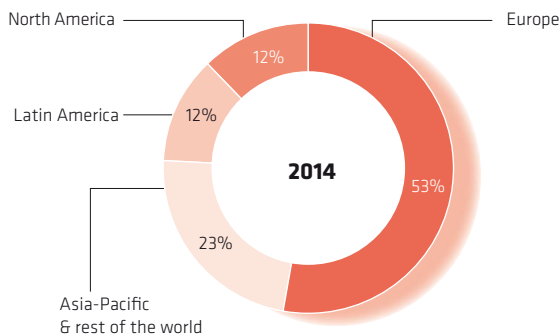
	2013	2014
Europe	13,676	13,439
Asia-Pacific & rest of the world	6,032	5,954
Latin America	2,992	3,013
North America	3,394	3,032
<b>Total FTE</b>	<b>26,093</b>	<b>25,438</b>
<b>TOTAL HEADCOUNT</b>	<b>27,146</b>	<b>25,909</b>

**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Rytton.

**Legend:** Main differences between FTE and Headcount is due to proportional consolidation method.

The Solvay group, headquartered in Brussels, had fewer employees at the end of 2014 than one year earlier (4.5%).

The distribution chart shows that 47% of Solvay Total FTEs are employed outside of Europe, with 23% in Asia and the rest of the world, and 24% in the Americas. The European part decreased slightly from 2013 to 2014.



**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

The Group's global presence covers all business aspects, including commercial, industrial, research and managerial functions (6 of its 14 Global Business Units are managed outside of Europe).

The employment structure reflects this trend. 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 distribution of employees is going to become more and more proportionate with distribution of sales. This helps the Group to ensure societal acceptance of its businesses in the regions.

Because of the Group's business model, employment is not subject to significant variations during the year. However, there are activities that function in campaign or project mode where alternative work arrangements provide a better fit with the operational needs and worker interests than traditional employment.

### Contingent Work

A considerable part of the Group's work is performed by individuals who are not under an employment contract with the Solvay group.

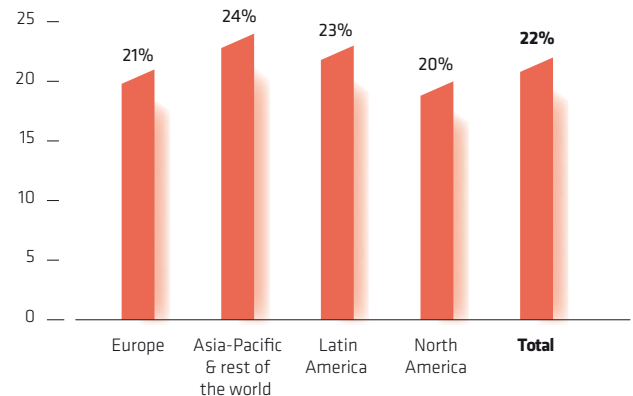
Such work is typically found where skills are not specific to the Group's activities and contingent work provides advantages such as higher skill level, lower cost or more flexibility, thus enhancing the flexibility of Group activities. This is mostly the case in high-level consulting, information technology and plant maintenance.

As the contractor is obliged to deliver these services and does not make a commitment based on the number of persons used for the work, we do not consolidate such numbers.

Based on records kept for safety monitoring we estimate that about 30% of the group's total workforce are not under an employment contract with a company of the Solvay group.

### Employment by gender

#### → Female by region



**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Ryton.

For more detail on employment by gender please refer to section G4-LA 12 page 87.

The highest percentages of female employees are in Asia and Latin America.


### Employment by working time

	2013	2014
<b>Total Permanent Full-time</b>	23,521	<b>24,258</b>
of which women	19%	<b>20%</b>
<b>Total Permanent Part-time</b>	591	<b>602</b>
of which women	82%	<b>80%</b>
<b>TOTAL HEADCOUNT</b>	<b>24,112</b>	<b>24,860</b>

**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Ryton.

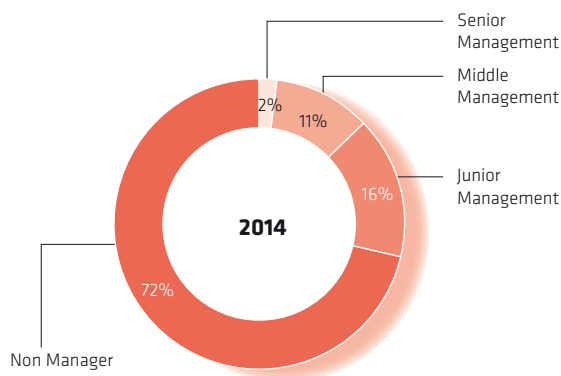
The number of women in permanent full-time employment has slightly increased in recent years. Nevertheless, the large majority of women are still in permanent part-time work (80% in 2014 after 82% in 2013). The Group is generally amenable to employee requests to offer part-time work wherever business requirements allow such an arrangement. This approach facilitates balancing work and private life and improves Solvay's employer brand, especially towards female candidates.

### Employment by level



	2013	2014
Senior Management	456	<b>428</b>
Middle Management	2,727	<b>2,731</b>
Junior Management	4,126	<b>4,186</b>
Non manager	19,837	<b>18,564</b>
<b>TOTAL HEADCOUNT</b>	<b>27,146</b>	<b>25,909</b>

**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Ryton. Changes in accounting methods have led to slight differences in figures given for 2013 in last year's report.



**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Ryton.

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

The decrease in overall number of employees finds a commensurate reduction in its middle and senior management levels – the junior management population remaining more or less stable.

### Grading

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 of 2012, the Group introduced its new global grade scale, which was rolled out in 2013.

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

This system helps the integration of acquisitions and creates a shared language with regard to the hierarchical career development path, as well as offering benchmarking.

### Job Families

For 90% of managerial functions a single "job family" document is created. This follows a standard format and identifies:

- The mission of the job;
- Key responsibilities;
- Expertise requirements;
- Competency requirements;
- 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 covered Solvay employees understand their roles and responsibilities within 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 skill mapping.

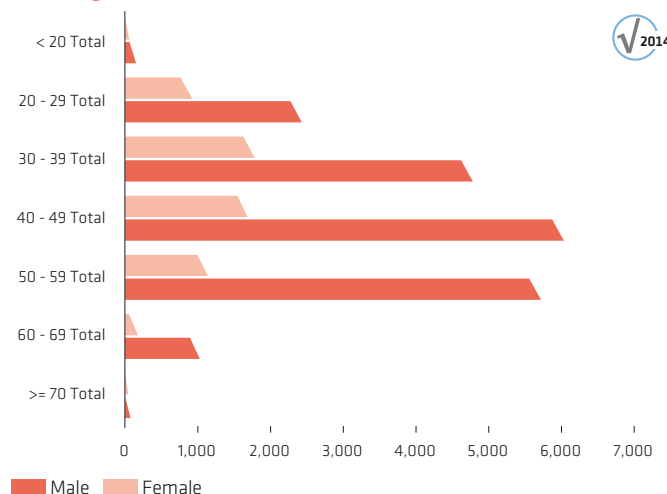
All manager positions are covered. The extension of this model to non-manager positions is envisaged, depending on the particularities and interests of the Group's sites.

In line with the Group's business model, by far the majority of positions fall into the Industrial domain.

For more detail on employment by level, please refer to section G4-LA 12 page 87.

### Employment by age range

#### → 2014 age structure



**Perimeter:** Solvay financial perimeter except Chemlogics, ERCA, Flux and Ryton.

The graph shows the breakdown of the Group's workforce by age range and by gender. This section provides the reader with an interesting insight into the age structure of the workforce.

It appears that the age structure is currently:

- 30% are older than 50;
- 30% are aged between 40 and 50;
- 40% are younger than 40.

Demographic evolution of Solvay employees is recognized as one of the potential barriers to sustainable development within the Group.

Initiatives have been taken at several levels to mitigate the risks arising from such a development:

- Methods for monitoring the situation and detecting critical populations are available to 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;
- The Solvay Way process foresees a specific practice to implement a continuous workforce planning process at each site.

On the initiative of Solvay a study was made by the University of Louvain, which canvassed managers older than 50 on their specific expectations of professional life.

Based on a joint initiative by managers and members of the European Works Council (EWC), a set of recommendations was developed which 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 the image of the Group in the market.

#### Employee representation indicator



**G4-11**

Trade unions are present at a majority of Solvay sites around the world. Union membership is estimated at 20% in Europe, 30% in South America, 10% in North America and 30% in Asia.

Collective agreements are in the majority of cases extended to all employees, even if they are not members of the union.



**Coverage by collective agreement becomes 82,2% worldwide.**

These data indicate that freedom of association is ensured within the Group and that its practical application provides our employees with mutually agreed conditions of employment.

### 3.3. Supply chain management

**G4-DMA on supplier environmental assessment**

**G4-DMA on supplier assessment for labor practices**

**G4-DMA on supplier human rights assessment**

**G4-DMA on supplier assessment for impacts on society**



**G4-12/G4-EN32/G4-EN33/G4-LA14/G4-LA15  
G4-HR10/G4-HR11/G4-S09/G4-S010**

Solvay expects its vendors, suppliers and customers to obey all laws and regulations governing their activities, both within their own worksites and the Group's. They are also encouraged to adhere to the spirit of Solvay's Code of Conduct in their operations. Solvay applies a worldwide structured, fair and ethical process to select and evaluate its suppliers in order to build mutually beneficial relationships with them. Solvay's suppliers are selected on the basis of objective criteria such as quality, reliability, competitive pricing and ethical behavior.

#### New Supplier Code of Conduct

During 2015, Solvay will deploy its new Supplier Code of Conduct which outlines the importance of Corporate Social Responsibility (CSR) to the Group. This Supplier Code of Conduct is aligned with the Solvay Code of Conduct and the CSR agreement with IndustriALL Global Union. It has been inspired by the UN Global Compact and Responsible Care® practices. It gives a tangible expression to Solvay's determination to strengthen partnerships with its suppliers through transparency, collaboration, innovation and focus on excellence. Critical suppliers can expect to receive an invitation to participate in a "Together for Sustainability" (TfS) audit or assessment..

The Supplier Code of Conduct focuses on topics of Legal Compliance for Business Integrity, Respect of Human Rights, Health and Safety Protection and Environment Protection.

### Purchasing framework

Solvay's purchasing spend amounts to approximatively 70% of Group turnover. The split by domain and zone is as follows:

→ Solvay purchasing spend by domain and zone, without energy

	Domain			
	General Expenses and Information Technology	Logistics and Packaging	Raw Materials	Technical Goods and Services
Asia Pacific	0,60%	1,50%	9,50%	2,50%
Europe, Middle East, Africa	5,60%	7,30%	29,30%	14,80%
Latin America	0,90%	1,60%	7,70%	1,70%
North America	1,60%	3,60%	8,30%	3,50%

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

# Sustainability statement

## ORGANIZATIONAL PROFILE

The total number of suppliers used by Solvay is 46,000. The share of critical suppliers is 55% of spend. Supplier numbers by region and domain are as follows:

### → Critical suppliers by domain and zone, without energy

	Domain				Total
	General Expenses and Information Technology	Logistics and Packaging	Raw Materials	Technical Goods and Services	
Asia Pacific	9	9	111	5	134
Europe, Middle East, Africa	14	14	259	19	306
Latin America	8	8	87	3	106
North America	11	12	116	4	143
<b>TOTAL</b>	<b>42</b>	<b>43</b>	<b>573</b>	<b>31</b>	<b>689</b>

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

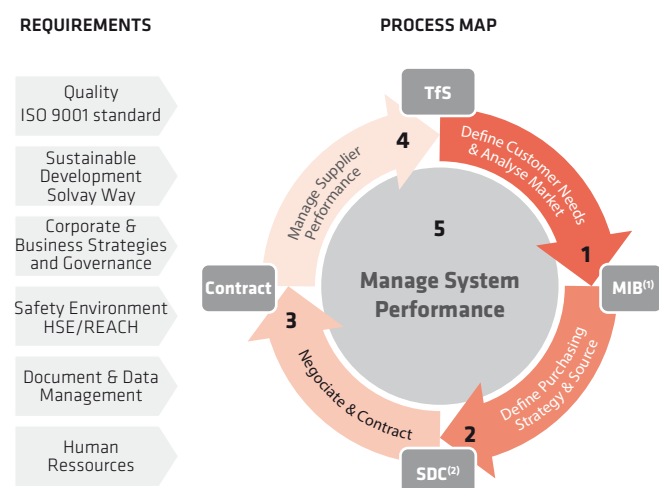
The Purchasing Function is responsible for the non-raw material purchases, and the GBUs are responsible for the raw material purchases.

Solvay implemented a reference model to determine which raw materials can be considered critical and which cannot on the basis of a number of quantitative and qualitative criteria. The weighting of each individual parameter can be modified in relation to the GBU raw material strategy. When a raw material is considered critical, this automatically triggers a review of whether the associated suppliers are critical or not.

## Purchasing process and quantitative indicators

Risk management and Corporate Social Responsibility are fully embedded in the Solvay Purchasing Process, which all of the Group's buyers need to respect. They were all trained to do so.

### → Solvay Purchasing Process



(1) Market Intelligence Booster  
(2) Sourcing Decision Committee

The Solvay Purchasing Process consists of the following steps :

#### Step 1: Define customer needs and analyze market

Specifications are determined on the basis of internal customer needs. Those requirements, in combination with mandatory applied CSR prerequisites, serve as an input for step 2.

#### Step 2: Define purchasing strategy & source

Specifications mentioned above are communicated to the suppliers in the first stage of the tendering process.

For all contracts with a value in excess of € 500,000, the buyers perform a fast multi-variable quantitative supplier analysis. Among the variables checked are supply risk and CSR. Solvay is one of the few companies in the chemical industry that broadly uses an assessment approach during the supplier selection stage.

#### Step 3: Negotiate and contract

For all contracts worth over € 500,000, the stakeholders concerned give a negotiation mandate to the buyers on the basis of the analysis. A new contract template has been introduced including a clause about the requirement to have periodic supplier performance review meetings. These meetings are an excellent opportunity to talk about potential discrepancies in terms of supply risks or CSR.

#### Step 4: Manage supplier performance

Supply risk and CSR performance are measured by an internal supplier evaluation and by the "Together for Sustainability" (TfS) initiative.

#### Step 5 : Manage system performance

System performance is assessed and, if necessary, improvement plans are defined.



## Internal Evaluation of Solvay suppliers

→ Number of suppliers assessed via internal evaluation

Entity	Domain					Total
	General Expenses, Information Systems, Information Technology	Logistics	Packaging	Raw Materials	Technical Goods and Services, Capital Expenditure	
Global Business Units				216		216
Global Domain	43	9	4		9	65
Asia Pacific	8	20	17		69	114
North America	6	10	4	5	28	53
Europe, Middle East, Africa	24	66	38	40	350	518
Latin America	14	19	5	10	35	83
<b>TOTAL</b>	<b>95</b>	<b>124</b>	<b>68</b>	<b>271</b>	<b>491</b>	<b>1049</b>

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

In addition to evaluating the performance of Solvay suppliers, satisfaction surveys are therefore performed on a yearly basis. In 2014, Solvay sent out 400 on-line questionnaires to Solvay's suppliers to check their degree of satisfaction.

## Together for Sustainability (TfS) initiative

This initiative was founded in the course of 2011 by 6 multinational chemical companies, among them Solvay, to drive supply-chain sustainability through industry collaboration. The long-term objective of TfS is to become a recognized standard for sustainability within the chemical industry. Since its foundation, the initiative's membership base has grown to 12 official members and will further increase in the coming months. Aligned with the ambition for TfS to become a globally recognized standard, the member base will in future also include non-European companies.

Please see the TfS website ([www.tfs-initiative.com](http://www.tfs-initiative.com)) for more information on the members of the initiative.

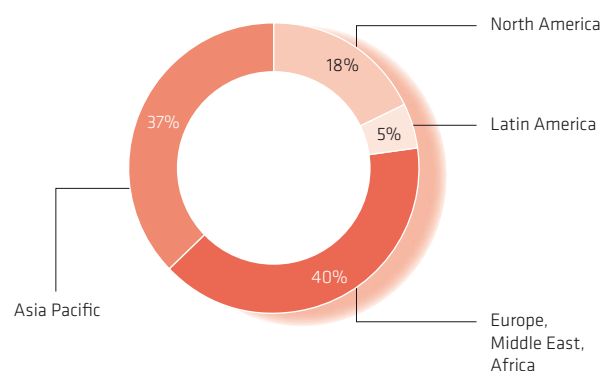
The initiative aims to reduce and streamline the workload for supplying and buying companies by sharing assessment and audit results among the TfS members. A supplier only has to respond once to a questionnaire or perform an audit instead of having to do this multiple times.

The two key processes applied to measure the sustainability performance of a supplier are electronic assessment or a physical audits.

## Sustainability assessments

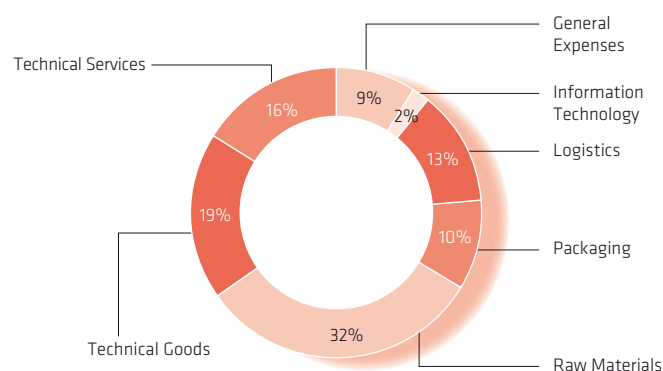
EcoVadis, an independent service provider, conducts the assessments by using questionnaires. Each one is adapted to the industry in which the supplier is active as well as to its company size and its geographic scope. The result of the assessment is made available to the supplier in the form of a scorecard, listing areas of strength and improvement, via the EcoVadis platform. The suppliers' CSR performance is measured in four sectors: Environment, Labor Practices, Fair Business Practices, Sustainable Procurement. 658 Solvay suppliers have been invited to be assessed since the start of TfS program and more than 350 assessments have been done. Please see below an overview of the efforts so far:

→ Suppliers by region



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

→ Suppliers by purchasing domain



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

## Sustainability Audits

In partnership with TfS, sustainability audits are conducted in China and Brazil. Major findings were identified mainly in the fields of "Health & Safety" and "Labor & Human Rights". Action plans were decided with the suppliers concerned.

Third-party audit companies that have been pre-selected by TFS conduct on-site audits based on an audit report template developed by the initiative. TFS does not conduct unannounced audits. The findings (positive and negative) identified during the audit are documented in a report shared with the TFS members. TFS audits are based on about 30 audit criteria covering the following five sectors: Management, Environment, Health & Safety, Labor & Human Rights, Governance.

Solvay has launched assessments throughout its whole supplier base, *i.e.* all purchasing categories and all geographic regions. For audits, TFS has focused its activities on suppliers located in China, Brazil and India since the initiative was launched, but TFS members are free to initiate audits in all countries/regions of the world.

Within the TFS initiative, a total of 2,605 suppliers have been assessed and 93 audits have been conducted during 2014.

Both TFS processes will highlight strength and improvement areas identified by the respective service provider after having conducted the assessment or audit (EcoVadis or audit company). In the case of an assessment, improvement areas can be transferred into a corrective action plan module so that progress can be measured and seen by supplier and buyer directly on the EcoVadis platform. For an audit, a corrective action plan documenting improvement areas identified during the audit will be discussed directly between the supplier and auditor at the end of the audit. A TFS assessment or audit is valid for a maximum of three years.

TFS aims to adopt a continuous improvement approach and dialogue with the supplier. The objective is to reinforce mutual understanding for sustainability aspects within the supply chain. To promote the initiative and create awareness and understanding among suppliers for the objectives and processes applied by TFS, an initial supplier event was held in Shanghai in October 2014. More than 350 participants attended the TFS Conference in China, among them suppliers, TFS member company representatives, local and international associations, and non-governmental organizations.

### Supplier visits and success stories

Managers and buyers also regularly visit supplier sites (both administrative and operational) to observe, discuss and comment on CSR policies and behavior.

During a supplier visit in Korea, several findings about overall site safety were observed and recommended to the supplier for improvement. Based on the visit feedback, the supplier performed a self-assessment and set up a corrective action plan. As proof of successful implementation of the identified corrective actions, the supplier sent photos (e.g. of safety perimeters now painted around the production equipment and of the use of personal protective equipment).

Solvay has been collaborating with Greif's conditioning partner, EarthMinded(R) Life Cycle Services (LCS), for several years now to help responsibly manage its used industrial packaging throughout North America. As the world's largest industrial packaging reconditioner, EarthMinded LCS collects, cleans, reconditions and remanufactures industrial packaging, giving containers a new life. The partnership has delivered success in 2014, including the collection of over 24,000 industrial packages. In 2014 alone, EarthMinded collected materials from eight Solvay facilities, reusing or recycling over 574,000 pounds of steel and nearly 591,000 pounds of plastics, delivering an impressive 88% container reuse rate, while reducing carbon and other greenhouse gas emissions.

Novecare has launched an initiative whose goal is to source Sustainable Palm Oil – Palm Kernel derivatives from Sustainable Sources that are traceable to the Mills by the end of 2015 and traceable to the Plantations by 2020. This ambitious initiative ensures an alignment with Novecare's partners and their policies, many of whom are represented by trusted external organizations to ensure confidentiality. Working with these organizations allows an open dialogue through business relationships building a strong collective strategy.

### Training

All buyers and purchasing managers were trained in the Solvay Purchasing Process (SPP) in 2013. A total of 165 buyers and purchasing managers were trained on the TFS process. In 2015, training sessions will be organized to help the buyers to better manage the follow-up of the TFS corrective action plans.

The Purchasing and Supply Chain Excellence Function is presently setting up Purchasing and Supply Chain Excellence Academies. Corporate Social Responsibility will be interwoven into the majority of the training modules.

## 4. Identified material aspects and boundaries

### G4-13 / G4-17/G4-18/G4-19/G4-20/G4-21/G4-22/G4-23

The GRI Annual Report presents a series of indicators which reflect the deployment of Solvay Way, the Solvay's Sustainability policy and which present the Solvay's 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 G4 (GRI) guidelines. This report is published in accordance with the Guidelines of the Core option. Under the GRI Content Index Service, the GRI has verified the accuracy of the GRI Content Index of this report.

The indicators are those that reflect, by their relevance, the Group's performance recognized good practices and the objectives set in the light of stakeholders' expectations.

Solvay is signatory to the UN Global Compact and supports the 10 principles with respect to human rights, labor, environment and anti-corruption. Using the GRI G4 Guidelines to communicate Progress on the UN Global Compact Principles, Solvay reaffirms its support according to the GC Advanced Level. This report discloses actions and results in the following dimensions:

- Implementing the 10 principles into Strategies & Operations in the areas of Human Rights, Labor, Environment, anti-corruption;
- Tackling action in support of Broader UN Goals and Issues;
- Corporate sustainability Governance and Leadership.

The GRI and Global Compact Index from 4 to 15 provides information on GRI indicators for topics relevant to the Global Compact principles and its 21 Advanced criteria.



This symbol indicates informations on the implementation of the ten principles and on the 21 Advanced criteria. If it appears at the beginning of a chapter, the entire content of the chapter is relevant..

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

- Solvay annual report;
- Solvay GRI Annual Report.



In order to ensure 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 the top of the energy and environmental information already verified in previous years, Human Resources and Safety indicators have been included in the audit scope. The CSR chapter of the Solvay annual report is also audited.

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 16-17.

### 4.1. Social and environmental consolidation scope

#### Reporting principles for defining report content

G4-33

In the spirit of progressive evolution towards integrated reporting, the scope and boundaries of this report have been aligned with the scope and boundaries from the financial statements.

Unless stated otherwise, all social and environmental indicators are reported at the **financial perimeter**, fully consistent with the Group's financial consolidation scope which includes 119 sites and 26,033 full time equivalent employees in 2014 (See Solvay's 2014 consolidation scope from page 200 to 208 of the Annual Report).

When relevant, data are also reported at the **operational perimeter**, which consolidates all activities **under operational control**. The operational perimeter covers more sites and people than the financial perimeter since it includes activities in joint arrangements. When specified, entities not included in the consolidated financial perimeter (*i.e.* discontinued operations) have also been included.

Greenhouse gases emissions are reported in consistency with the World Business Council for Sustainable Development "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain".

(<http://www.wbcsd.org/Pages/EDocument/EDocumentDetails.aspx?ID=15375>).

Emissions type	Scope	Definition
Direct emissions	Scope 1	Emissions from operations that are owned or controlled by the reporting company.
Indirect emissions	Scope 2	Emissions from the generation of purchased or acquired energy such as electricity, steam, heating or cooling consumed by the reporting company

### 4.2 Material aspects identified in the process for defining report content

Solvay has fully reviewed its materiality analysis in 2014, using the Sustainability Accounting Standards Board ([www.sasb.org](http://www.sasb.org)) approach. The SASB's approach has been selected because it offers an exhaustive, validated list of material issues to start with, and three tests for issue prioritization allowing also to level short-term and long-term impacts:

- Evidence of interest: frequency of occurrence of the issue in publications related to our company or industry;
- Evidence of financial impact: identification of impact on revenue and cost, assets and liabilities, and risk profile;
- Forward-looking impact: assessment of the evolution of the issue's importance over time, in terms of magnitude, probability or externalities.

# Sustainability statement

## IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES

The Sustainable Development Function coordinated the analysis, involving their network of champions in Global Business Units and Functions.

The list of material issues published by the SASB was first reviewed to check if it was exhaustive or needed completion. Then an initial draft list of high materiality issues was generated, using inputs from the Sustainable Development champions in each function and preliminary work on the chemical industry originated by the SASB. This preliminary list was then analyzed based on the methodology published by the SASB: evidence of interest (low, medium, high), evidence of financial impact (low, medium, high), and forward-looking adjustment (no, yes). Additional High Materiality Issues were added when relevant.

The work was then cross-checked by experts in the main Corporate Functions, and the full list of material issues was again reviewed with each of the experts. Particular attention was given to cross-checking the analysis with the work done by the Risk Management team to ensure

consistency with the risk map of the Group. The list of high materiality issues was again updated to take into account this review.

Last, the analysis was cross-checked with the SASB's draft "CHEMICALS Sustainability Accounting Standard" published in October 2014.

([http://www.sasb.org/wp-content/uploads/2014/10/RT0101\\_Chemicals\\_2014-10-08\\_PubComm.pdf](http://www.sasb.org/wp-content/uploads/2014/10/RT0101_Chemicals_2014-10-08_PubComm.pdf)).

Indicators were selected for each high materiality issue with the corresponding functions, based on available indicators.

Two pilots were initiated with two Global Business Units (Specialty Polymers and Novecare) to review the analysis, identify each business unit's own priorities among the high materiality issues of the Group, and identify additional high materiality issues specific to their own business. The feedback will be used to update the Group's analysis, if relevant, and to develop integrated dashboard pilots.

12 issues have been identified as highly material and 4 have been defined as Group priorities (in **bold** in the table):

Category	Moderate materiality	High materiality
Environment	Climate change risks Fuel management and transportation Waste management and effluents Biodiversity impacts	Energy management <b>GHG Emissions</b> Environmental accidents and remediation Water use and management Air quality Hazardous materials management
Social Capital	Communications and engagement Community Development Impact from facilities Customer health and safety Disclosure and labelling Marketing and ethical advertising Access to services Customer privacy New markets	Customer satisfaction
Human Capital	Diversity and equal opportunity Training and development Recruitment and retention Compensation and benefits Child and forced labor	<b>Employee health and safety</b> <b>Employee engagement and wellness</b>
Business Model and Innovation	Accounting for externalities Product societal value Product life-cycle use impact Packaging Product pricing Product quality and safety	<b>Sustainable business solutions</b>
Leadership and Governance	Policies, standards, Codes of conduct Shareholder engagement Board structure and independence Executive compensation Lobbying and political contributions Raw materials demand Supply chain standards and selection Supply chain engagement and transparency	Management of the legal, ethics & regulatory framework Process safety, emergency preparedness & response

New sustainability targets will be defined in 2015 in accordance with the new materiality analysis.

The materiality exercise identifies aspects that are material for the Solvay group as a whole, because the SASB tests of evidence of interest, evidence of financial impact, and forward-looking adjustment were conclusive at corporate level.

One aspect has been included in the list of Highly Material Issues because it has been identified as highly material for a number of Global Business Units: Customer Satisfaction.

The "Evidence of Interest" test from the SASB methodology helps to capture the sustainability concerns of different stakeholders that the

reasonable investor cares about and that have the potential to impact corporate performance.

The analysis will be completed in 2015 with the engagement of stakeholders on this specific topic. The analysis will be adapted, if required, based on this feedback.

Historical data are restated for comparison purposes, unless otherwise indicated.

- 2013 data for the Group's application of IFRS 11, effective January 1<sup>st</sup>, 2014.
- 2013 and 2014 data for the discontinuation of Eco Services.

## 5. Stakeholder engagement

G4-24/G4-25/G4-26/G4-27


### 5.1. Solvay Way's commitments towards stakeholders









The Solvay Way reference framework is structured by stakeholders, with the following stakeholders identified as the most important, and the commitment and practices of the reference framework detailed. These stakeholders were identified when the Solvay group first implemented a sustainability framework, more than ten years ago. The Rhodia group, acquired in 2011, had identified the same stakeholders. The following table shows the Solvay Way's 22 commitments and the 49 associated practices. The table also shows the correspondances between the Solvay Way practices and GRI expectations:

Stakeholder	Solvay Way Commitment / Solvay Way practices	Connections with GRI
<b>Customers</b> 	<b>Integrating our CSR commitments into our customer relationships</b>	
	■ Developing a collaborative approach to CSR	■ Stakeholder engagement
	■ Informing customers of product-related risks	■ DMA - Customer Health and Safety ■ DMA - Product and Service labeling
	■ Reacting to requests for information and to complaints	■ DMA - Marketing communications
	<b>Controlling product-related risks</b>	
	■ Deploying the Product Stewardship management system	■ DMA - Product Responsibility
	■ Managing the risks from substances of very high concern (SVHCs)	■ DMA - Product Responsibility
	<b>CSR-integrating innovation &amp; investment</b>	
	■ Identifying, selecting and managing CSR-integrating product and process innovation projects	■ Strategy and Analysis
	■ Identifying, selecting and managing CSR-integrating investment projects	■ Strategy and Analysis
<b>Employees</b> 	<b>Analyzing and developing our markets, while integrating CSR</b>	
	■ Detecting mega-trends, selecting target orientations	■ Strategy and Analysis
	■ Orienting the action plans of operational entities towards responsible value creation	■ Strategy and Analysis
	<b>Ensuring employees' health and safety</b>	
	■ Controlling the risks associated with occupational exposures	■ DMA - Occupational Health & Safety
	■ Promoting health and wellbeing at work	■ DMA - Occupational Health & Safety
	■ Preventing occupational accidents	■ DMA - Occupational Health & Safety
	<b>Respecting employees' fundamental human rights and guaranteeing their social rights</b>	
	■ Deploying the global CSR agreement	■ DMA - Labor practices and decent work ■ DMA - Freedom of association and collective bargaining ; ■ G4-HR4
	■ Developing a culture of diversity, performance lever	■ DMA- Diversity and equal opportunity ; ■ G4-LA12
	■ Making diversity a local performance lever	■ DMA- Diversity and equal opportunity ; ■ G4-LA12
	<b>Ensuring quality social dialogue</b>	
	■ Respecting employees' rights of representation	■ DMA - Freedom of association and collective bargaining ; G4-HR4
	<b>Developing employability</b>	
	■ Developing employees' skills	■ DMA - Training and education ; G4-LA9 ; G4-LA10 ; G4-LA11
	■ Forward management of employees and skills needs	■ DMA - Training and education ; G4-LA9 ; G4-LA10 ; G4-LA11
	<b>Motivating employees</b>	
	■ Deploying and aligning objectives	■ G4-LA10 ; G4-LA11
	■ Promoting improvement projects and suggestion systems	■ G4-24 ; G4-25
	■ Compensating employees fairly	■ DMA - Employment
	■ Integrating CSR commitments in remuneration policy	■ DMA - Employment

Stakeholder	Solvay Way Commitment / Solvay Way practices	Connections with GRI
<b>Planet</b> 	<b>Promoting environmental management</b>	
	<ul style="list-style-type: none"> <li>■ Deploying an environmental management system</li> <li>■ Sensitizing and involving employees</li> <li>■ Respecting and anticipating regulations</li> <li>■ Listing and handling incidents</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA - Environmental dimension</li> <li>■ DMA - Training and Education</li> <li>■ DMA - Compliance</li> <li>■ Environmental Grievance Mechanisms</li> </ul>
	<b>Preserving natural resources</b>	
	<ul style="list-style-type: none"> <li>■ Improving energy efficiency</li> <li>■ Optimizing raw materials consumption and reducing waste</li> <li>■ Reducing water consumption</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA- Energy</li> <li>■ G4-EN3 ; G4-EN4 ; G4-EN5 ; G4-EN6 ; G4-EN7»</li> <li>■ DMA - Materials</li> <li>■ DMA - Effluent and Waste</li> <li>■ DMA - Water</li> <li>■ G4-EN8 ; G4-EN9 ; G4-EN10</li> </ul>
	<b>Limiting environmental impact, preserving biodiversity</b>	
<b>Investors</b> 	<ul style="list-style-type: none"> <li>■ Reducing greenhouse gas emissions</li> <li>■ Reducing the impact of processes on air, water and soil quality</li> <li>■ Preserving biodiversity on and around sites</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA - Emissions</li> <li>■ G4-EN15 ; G4-EN16 ; G4-EN17 ; G4-EN18 ; G4-EN19</li> <li>■ DMA - Emissions</li> <li>■ DMA - Water</li> <li>■ DMA - Biodiversity</li> </ul>
	<b>Exercising responsible influence</b>	
	<ul style="list-style-type: none"> <li>■ Transparent dialogue and communication</li> </ul>	<ul style="list-style-type: none"> <li>■ Stakeholder engagement</li> <li>■ DMA - Public policy</li> </ul>
	<b>Creating value responsibly</b>	
	<ul style="list-style-type: none"> <li>■ Measuring responsible value creation</li> <li>■ Integrating CSR into our acquisition decisions</li> </ul>	<ul style="list-style-type: none"> <li>■ Economic performance</li> <li>■ Indirect economic impacts</li> <li>■ Strategy and Analysis</li> </ul>
<b>Suppliers</b> 	<b>Ensuring risk management</b>	
	<ul style="list-style-type: none"> <li>■ Managing risk on a global basis</li> </ul>	<ul style="list-style-type: none"> <li>■ Strategy and Analysis</li> </ul>
	<b>Ensuring dissemination of and compliance with good management and governance practices</b>	
	<ul style="list-style-type: none"> <li>■ Developing responsible practices and behavior</li> <li>■ Promoting good governance at Solvay</li> </ul>	<ul style="list-style-type: none"> <li>■ Ethics and integrity</li> <li>■ Governance</li> </ul>
	<b>Defining prerequisites and integrating them into the supplier selection process</b>	
	<ul style="list-style-type: none"> <li>■ Defining prerequisites, selecting suppliers accordingly</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA - Supplier environmental assessment</li> <li>■ DMA - Supplier assessment for labor practices</li> <li>■ DMA - Supplier human rights assessment</li> <li>■ DMA - Supplier assessment for impacts on society</li> </ul>
	<b>Evaluating buyers' CSR performance</b>	
	<ul style="list-style-type: none"> <li>■ Training and assessing buyers</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA - Supplier environmental assessment</li> <li>■ DMA - Supplier assessment for labor practices</li> <li>■ DMA - Supplier human rights assessment</li> <li>■ DMA - Supplier assessment for impacts on society</li> </ul>
	<b>Managing and assessing suppliers' CSR performance, optimizing relationships</b>	
	<ul style="list-style-type: none"> <li>■ Managing and evaluating supplier performance</li> <li>■ Developing partnerships for innovation</li> <li>■ Ensuring balanced relationships with suppliers</li> </ul>	<ul style="list-style-type: none"> <li>■ DMA - Supplier environmental assessment</li> <li>■ DMA - Supplier assessment for labor practices</li> <li>■ DMA - Supplier human rights assessment</li> <li>■ DMA - Supplier assessment for impacts on society</li> <li>■ DMA - Supplier environmental assessment</li> <li>■ DMA - Supplier assessment for labor practices</li> <li>■ DMA - Supplier human rights assessment</li> <li>■ DMA - Supplier assessment for impacts on society</li> <li>■ DMA - Supplier environmental assessment</li> <li>■ DMA - Supplier assessment for labor practices</li> <li>■ DMA - Supplier human rights assessment</li> <li>■ DMA - Supplier assessment for impacts on society</li> </ul>

Stakeholder	Solvay Way Commitment / Solvay Way practices	Connections with GRI
<b>Local communities</b> 	<b>Ensuring the integration of entities within their territories</b>	
	■ Developing and steering relationships with local stakeholders	■ Stakeholder engagement
	■ Contributing to local development	■ Local communities
	<b>Controlling industrial risks related to entities' presence in their territories</b>	
	■ Identifying hazards and assessing industrial risks	■ DMA - Grievance mechanisms for impact on society
	■ Managing industrial risks for the community	■ DMA - Environmental grievance mechanisms
	■ Preparing for emergency situations	■ DMA - Grievance mechanisms for impact on society
		■ DMA - Environmental grievance mechanisms
	<b>Controlling supply chain risks and preventing accidents</b>	
	■ Preventing accidents	■ DMA - Grievance mechanisms for impact on society
		■ DMA - Environmental grievance mechanisms

Stakeholders are engaged throughout the year through various channels. The following table lists the main engagement channels and the main feedback from stakeholders:

Stakeholder	Main engagement channels	Main feedbacks in 2014
<b>Customers</b> 	Engagement managed by each Business Unit	Customer satisfaction is highly material for a number of business units and moderately material for other business units
<b>Employees</b> 	IndustriALL Global Union contacts and site visits (see pages 25) European Works Council meetings	Frequent dialogue needed, particularly in the current active portfolio management context
<b>Planet</b> 	Mission of the Public Affairs Department	Increasing emphasis on management of SVHCs ("Substances of Very High Concern") Increasing regulatory pressure for Environmental, Social and Governance reporting
<b>Investors</b> 	ESG investors roadshows Board interactions Non-financial rating agency feedback (DJSI, CDP, Vigeo, Oekom, FTSE4Good)	Increasing emphasis on materiality Increasing emphasis on management of SVHCs Increasing pressure for an integrated approach to sustainability
<b>Suppliers</b> 	Together for Sustainability initiative TfS conference in China: about 350 participants – including suppliers, TfS member company representatives as well as local and international associations and non-governmental organizations.	Better metrics needed to assess performance
<b>Local communities</b> 	Engagement managed at site level adapted to local situation	(feedback managed locally)

These feedbacks have been incorporated in the revision of the materiality analysis performed in 2014.



## 5.2. Performance recognized in extra-financial ratings



### Sustainability rating agencies

Although Solvay has received positive ratings from major extra-financial rating agencies (Carbon Disclosure Project, Vigeo, Oekom, Evalserve, Eiris), the Group, which was ranked in the 2013 Europe index of the Dow Jones Sustainability Index (DJSI), was not selected for 2014.

Every year, Solvay, as a quoted company, answers questionnaires from global or European extra-financial rating agencies. They analyze and classify companies according to their results in the field of Corporate Social Responsibility (CSR). Best-performing companies are ranked in the different non-financial stock market indexes. Inclusion in these gives Solvay's investors and others external stakeholders a broader base for assessing the Group's global performance. It also gives Solvay a good opportunity to challenge its policies, processes and practices in terms of their ability to integrate the sustainability dimension. The challenge for this year will be to analyze the weak aspects pointed out by the DJSI to improve Solvay's overall sustainability performance.

Below you will find the main results and comments:

Rating agency	Global result	Positioning	Best scores	Weakest scores
<b>RobecoSAM</b> (reference for Dow Jones Sustainability Index) 	Score <sup>(1)</sup> of 77/100	Better than 81% of the companies from the sector	<ul style="list-style-type: none"> <li>Human capital development</li> <li>Environmental policy and management system</li> <li>Antitrust policy</li> </ul>	<ul style="list-style-type: none"> <li>Customer relationship management</li> <li>Operational eco-efficiency</li> <li>Product stewardship</li> </ul>
<b>Carbon Disclosure Project</b> (reference for Carbon Disclosure Leader Index and Carbon Performance Leader Index) 	Category B with a score of 90/100 Solvay included in the Climate Disclosure Leadership Index (CDLI)	One of the top 10 in the Benelux Carbon Disclosure Leadership Index	<ul style="list-style-type: none"> <li>Transparency about governance and strategy</li> <li>Transparency about reporting of emissions</li> <li>Good risk and opportunities management related to climate change</li> </ul>	<ul style="list-style-type: none"> <li>Performance of governance and strategy related to climate change</li> <li>Performance in the reporting of emissions</li> <li>Verification of the Scope 3 emissions</li> <li>Transparency about risk and opportunities related to climate change</li> </ul>
<b>Evalueserve</b> (reference for FSTE4Good) 	Absolute score: 3.8/5 Solvay included in the FTSE4Good Index	Score relative to peers: 98%	<ul style="list-style-type: none"> <li>Within the first decile of the "supersector" companies</li> </ul>	<ul style="list-style-type: none"> <li>Governance</li> <li>Climate change</li> <li>Health and safety</li> <li>Labor standard</li> </ul>
<b>Vigeo</b> (reference for NYSE Euronext Vigeo 120 world, Ethibel Excellence) 	Overall score of 58/100 <sup>(2)</sup>	Solvay's performance is considered to be robust and stable	<ul style="list-style-type: none"> <li>Environmental strategy</li> <li>Health and safety</li> <li>Energy</li> <li>Product safety</li> <li>Water</li> <li>Accidental pollution</li> <li>Atmospheric emissions</li> </ul>	<ul style="list-style-type: none"> <li>Governance</li> <li>Transportation</li> <li>Green products</li> <li>Community involvement</li> <li>Responsible lobbying</li> </ul>
<b>Oekom</b> 	Rated B-	Classified as Prime. Prime companies rank among the leaders in their industry	<ul style="list-style-type: none"> <li>Strategy for addressing climate change and related risks</li> <li>Incorporation of environmental product life cycle assessments in the development of new products</li> <li>Good measures to check compliance of key suppliers with the company's labour/health and safety standards</li> <li>Group-wide implementation of safety management systems and comparatively low accident rate</li> </ul>	<ul style="list-style-type: none"> <li>Strategy to substitute substances of concern</li> <li>Information on substances and product risk assessments</li> </ul>

(1) The score are: 75/100 for the economic, 80/100 for the social and 76/100 for the environmental dimensions.

(2) The score are 60/100 for environment, 72/100 for human resources, 67/100 for human rights, 37/100 for community involvement, 53/100 for business behavior, 50/100 for governance.



## Dialogue with investors on sustainability

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

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

	2011	2012	2013	2014
<b>Meeting with investors focused on sustainability</b>	12	10	26	<b>25</b>

## 6. Ethics and integrity



G4-56/G4-57/G4-58

### Solvay Code of Conduct

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.

### Legal and Compliance function

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.

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.

### Speak Up

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; alternatively 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 (both phone and web), 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 behaviour 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.



# 4.

## Economic

<b>1. Research &amp; Innovation management</b>	<b>42</b>
1.1. Sustainable innovation highlights in 2014	42
1.2. Open innovation	43
1.3. Innovation main figures	45
<b>2. Economic performance</b>	<b>46</b>

# 1. Research & Innovation Management



Research and Innovation (R&I) policy strongly reflects Solvay's ambition to reduce its environmental footprint and to increase the proportion of its revenues that meet the challenges of sustainable development. In 2014, Global Business Units (GBUs) and Functions worked jointly with a cross-functional innovation approach in order to provide its customers with high added-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 R&I policy.

R&I efforts are driven by the following four innovation levers:

- a process of excellence to improve its efficiency and shorten time to market: this process for managing technological innovation, known as WEGO, was launched in 2014 and is now being rolled out throughout the Group, GBU by GBU, with the aim of full implementation by mid-July 2015;
- an intellectual property policy to drive Solvay's future differentiation
- an extended network of open innovation (through partnerships with academics, SMEs or other industrials) to maximize its efficiency and tap into the creativity and competencies of the outside world;
- exploratory partnerships with startups and venture capital funds which allow Solvay to unleash potential in strategic areas.

The Group has also dedicated 18% of the total R&I efforts to corporate activities, with the clear intention to maintain long-term development projects. These projects aim at either building knowhow and competencies in emerging technologies or developing diversification and new business development opportunities through breakthrough innovations. R&I corporate is focusing its efforts on four areas of innovation that it has 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.
3. **Eco-processes:** Solvay is developing breakthrough innovations for itself and its clients, offering diminished energy consumption and raw materials, reduced emissions and lower investment costs.
4. **Renewable chemistry:** Innovation in renewable or recycled raw materials contributes to the evolution of Group products and processes.

## 1.1. Sustainable innovation highlights in 2014

In 2014, the GBUs confirmed their ability to deliver on innovation:

### Novel Halar® ECTFE Film Grades are new options for the Solar Industry

Specialty Polymers has launched new film grades of Halar® ethylene chlorotrifluoroethylene (ECTFE) that are specifically designed for front sheet applications in photovoltaic (PV) modules. The new Halar® PV ECTFE products are melt-processable fluoropolymer resins that can be extruded into a highly transparent film (over 90% light transmission). They provide an excellent water vapor barrier (< 1 g/m<sup>2</sup>/day) in a wide range of temperatures and offer strong chemical resistance, exceptional fire resistance, and long-term weatherability, making them suitable for 20-plus years of direct exposure to sunlight. In addition to Halar® PV ECTFE, the newly launched Halar® UV blocking technology is the only solution of its kind in the industry. The new product offers the same properties as Halar® PV but also employs patented technology to deliver long-lasting UV blocking performance aimed at meeting the solar industry's 25-year performance-life target for PV modules.

### Seed boosting: germination increased from 10% to 15%

Seed Booster is an innovative seed treatment based on agro-polymer derivatives produced by Novecare. These polymers enhance water absorption and increase the germination of seeds, which results in improved agricultural yields. This truly breakthrough innovation has been initiated by one of the fifteen advanced research labs. The research related to the effects of polymers on retention water has been driven by Novecare, working in tandem with its seed companies customers. This approach ensures the commercial relevance of innovation.

### Fertilizer protection: optimizing the use of fertilizers while reducing the environmental footprint of agriculture

To optimize the use of nitrogen contained in urea-based fertilizers and reduce their environmental impact, Solvay has developed formulations that contain green solvents: the Fertilizer protection range. This Novecare product range inhibits the enzyme urease and reduces fertilizer use by up to 20% while increasing yields. Harmful effects on the environment and humans, such as greenhouse gas emissions and soil and groundwater pollution (eutrophication), are also lowered.

These solutions are already commercialized in Europe, the United States and Canada as AgRHO NH<sub>4</sub> Protect, Protect AgRHO N B, and AgRHO N50. Registration in other countries, including China, is ongoing.



## Introduction of Eco-Friendly Tixosil® MicroPearl Silica for personal care applications at In-Cosmetics 2014 in Hamburg, Germany

Silica has introduced an eco-friendly grade of its Tixosil® range of highly dispersible silica products, designed to substitute plastic beads in exfoliating body wash, facial cleanser and other specialized personal-care formulations. Tixosil® MicroPearl Silica is a non-dusting, environmentally safe and sustainable alternative to plastic (PE) beads, which have recently raised environmental concerns due to their potential pollution hazard when leaking from municipal waste-water treatment plants. Moreover Tixosil® is odorless, chemically inert and considered non-hazardous in manufacture, transportation, handling and application.

## Ocalio: an innovative bio-plastic based on cellulose acetate

At the annual Chinaplas tradeshow, held in Shanghai Solvay in April 2014, Acetow introduced Ocalio™ cellulose acetate bio-plastic, which is manufactured using wood pulp, an entirely renewable resource obtained from Sustainable Forestry Initiative (SFI) certified forests. This new and amorphous engineering bio-plastic is a non-toxic material. Unlike many bioplastics, Ocalio™ only uses wood pulp. Being an entirely renewable resource, it does not compete for food resources. It also has a much lower CO<sub>2</sub> manufacturing footprint compared with petroleum-based products.

## Promising new candidates for more easily biodegradable agro-active ingredients

In November 2014, Special Chemicals opened a new production facility in Bad Wimpfen, Germany, for the fluorinated product ETFBO, which is used in agrochemical products. ETFBO (4-ethoxy-1,1,1-trifluoro-3-butene-2-one) is a building block that makes active-ingredient molecules more effective and more easily biodegradable. These ingredients are becoming increasingly significant due to their environmental compatibility and high efficiency. Further downstream, products based on ETFBO are appearing on the horizon. Early-phase, patent-protected ionic liquid products (CF<sub>3</sub>-Pyrazoles made from ETFBO) as well as CF<sub>3</sub>-Pyrimidines, CF<sub>3</sub>-Pyridinecarboxylates and CF<sub>3</sub>-Pyrimidones are, for example, promising new candidates in process screening for new agro-active ingredients.

## Solvay smart fibers Amni® and Emana® win international innovation awards

Fibras's biodegradable yarn Amni® Soul Eco and its bioactive mineral yarn Emana® have won several innovation awards this year, recognizing their high value-added benefits to the environment and to their wearers.

## PREVERE, a sodium sulphate-free process

As part of the Solvay Way Sustainable Development policy, and with the support of the Corporate Eco-Processes platform, Aroma Performance seeks to avoid the generation of sodium sulphate in the vanillin process right from the source. Although Sodium sulphate is harmless for humans and the environment. The PREVERE project's goal is to reduce the amount of sodium sulphate by more than 99% using two technologies developed at the R&I center in Lyon: selective adsorption and membrane electrodialysis.

## 1.2. Open innovation



At Solvay we care about working together with our customers, with academia and with other companies or start-ups in order to leverage multiple sources of ideas and thereby identify the best possible solution to a problem. Overall, we currently manage more than 100 collaborative innovation projects.

The ultimate aim of Open Innovation is to provide the Group with the best skills and technologies currently available in their specialist areas, with the main priority being to satisfy and anticipate the needs of customers and market.

### R&I collaboration

#### Solvay continued to develop collaborative innovation in 2014

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 operate in four Joint Research Units, two in France, one in the United States, and one in China. Solvay has a dedicated support team involved in numerous collaborative projects. Most frequent partners are CEA (Commissariat à l'Énergie Atomique et aux énergies alternatives), CNRS (Centre National de la Recherche Scientifique), Fraunhofer, Arkema, IFPEN, Renault, EDF, INSA (Institut national des sciences appliquées), PSA Peugeot Citroën, and DTU (Technical University of Denmark).

The Competitiveness Cluster Axelera, launched by Solvay and partners, now offers a network of 300 members, including many SMEs, for the development of chemistry and environment.

IDEEL Low-Carbon Technos Innovation Institute, established by Axelera, has made a solid start and is growing rapidly. IDEEL organizes collaborative projects with its research teams and R&I equipment. Solvay is involved in core competency programs, such as On line Industrial Analysis and Simulation, and sector programs such as Biobased Chemistry, Sustainable Materials and CO<sub>2</sub>.

Two Axel'One platforms were opened in 2014 on materials and processes. A third platform on upstream research is being developed in close collaboration with academic teams.

Solvay is working with the French bio-based chemistry association Association Chimie Du Végétal (ACDV) to promote the development of renewable resources for plant-based chemistry with a European roadmap designed in 2014. Proactive involvement in bio-based partnerships such as P.I.V.E.R.T., Toulouse White Biotechnology and the Industry and Agro-resource cluster in France, the Brazilian Bioethanol Science and Technology Lab in Brazil, and Europabio and BIC in Europe has provided opportunities to establish strategic collaborations.

#### 1.2.1. Advanced materials

##### Compass collaborations with academics on plasmonic emission sustainability

The Complex Assemblies of Soft Matter Laboratory in Bristol, in the United States, is collaborating with CNRS and the University of Pennsylvania on two major projects concerning "Plasmonic Emissions" and "New Materials", which involve mixing nanoparticles with emulsions. The plasmonic emission sustainability is made possible through a reduction in the use of rare earth metals (Er and Yb) coupled with a reduction in the energy needed. The result is 50% brighter screens. The New Materials produced from emulsions and nanoparticles would provide increased surface area, thereby allowing more and different catalysts to be embedded.

### Unlocking the potential of women in science

In June 2014, Solvay officially opened its new Research & Innovation (R&I) center at the Ewha Womans University in South Korea, the world's largest women's university. At the 6,600-square-meter facility, the Company joins forces with Ewha's professors and researchers to develop high-end chemical products that will be used in batteries, electronic goods and automobiles, Organic Light Emitting Diode (OLED) display technology and materials for lithium-ion batteries. The two partners are already working on several projects, including research on the development of futuristic metal-air batteries.

### 1.2.2. Sustainable energy

#### Great future for Solvay products in lithium-ion capacitor technology

The EU-funded collaborative project Energy Caps has continued to deliver great results in 2014. The objective of this consortium is to develop lithium-ion capacitors as an interesting alternative to the lead-acid battery, *e.g.* to meet the demand for uninterrupted power supplies (UPS) (especially vital for hospitals, telecommunication centers, critical production plants, etc.). Aroma Performance's LiTFSI products are used in the development of new electrodes, high-performance separators and optimized electrolyte mixture. It is envisaged that the next step will be to set up a pilot-scale production plant, including a prototype recycling system and a UPS demonstrator.

#### Solvay launches major sustainability project to explore alternative manufacturing process for Li-ion battery materials

Specialty Polymers has announced the launch of the LIFE+ GLEE project, a highly focused sustainability program. This technology opens a significant path toward the production of a solvent-free green rechargeable Li-ion battery manufacturing process. Rechargeable Li-ion batteries are seeing strong growth in a range of markets, including mobile phones, laptop computers, and electric vehicles. In 2015, Solvay will construct a pilot plant in Bollate, Italy.

### 1.2.3. Eco-processes

#### Innovative MBBR technology contributes to reduction of environmental emissions

In collaboration with Peroxide and the manufacturing site at Jemeppe-sur-Sambre, R&I has demonstrated the benefits of using a technology which is innovative to the Group for the pre-treatment of a selected waste-water stream from the hydrogen peroxide production plant. This biological treatment is a Moving Bed Biofilm Reactor (MBBR) using polyvinyl alcohol-gel beads as a carrier. This technology is a good alternative to competing technologies using solvents Liquid/Liquid Extraction (LLE) or energy-intensive technologies (Evaporation-Concentration) while reaching a higher level of efficiency than LLE. The scale-up to an industrial unit is under design. It will contribute to a significant reduction in emissions to the environment.

#### Innovative processes for CO<sub>2</sub> valorization into chemicals for chemical and energy applications

The collaborative project VALCO2 II aims to develop three different large-scale CO<sub>2</sub> valorization methods to produce raw materials for the chemical industry (such as hydrogen carbonates, alkyl carbonates and formic acid) or non-fossil sources of energy. CO<sub>2</sub> storage and/or valorization is one of the major challenges for the sustainable industry of the future. In addition to its positive impact on the environment, VALCO2 will ensure cost-effectiveness. The project is being coordinated by Solvay (Soda Ash & Derivatives), with academic partners including IFPEN, the SME Inevo and the Institute of Excellence IDEEL. The project is co-funded by Conseil Régional Lorraine + BPI France.

### 1.2.4. Renewable chemistry

#### Solvay Energy Services launches torrefied biomass production to promote energy transition

Solvay and US company New Biomass Energy (NBE) have created a joint venture called Solvay Biomass Energy. The JV will produce torrefied biomass pellets made with local biomass processed through a torrefaction unit located in Mississippi. The purpose of torrefaction is to remove water and some volatile components from biomass in order to obtain a solid fuel with high energy content. Torrefied biomass, which handles and burns similarly to coal, may provide a practical substitute for coal, enabling power plants to generate clean energy.

#### LIGNORENOV: valorization of lignin from industrial waste

The LIGNORENOV project was launched in 2014 by Coatis, working in partnership with EMBRAPA, a network of forty-eight Brazilian laboratories seeking to develop renewable chemistry solutions in Latin America. This project, co-funded by the Brazilian Development Bank (BNDES), aims to develop processes and products for the utilization of lignin from industrial wastes with a view to producing chemicals for use as renewable raw materials in the chemical industry.

## Distributed creativity

#### The "BASYS" collaborative program between Michelin and Silica, supported by ADEME

The "BASse hYSTérèse" (low hysteresis program) aims to trigger technological breakthroughs in all areas of the automobile industry with a view to achieving the European Roadmap 2050 project's goal of reducing CO<sub>2</sub> emissions from private cars by approximately 4 g/km per year between 2012 and 2020. More than 100 experts regularly meet in working groups to develop different initiatives that have been submitted to the ADEME environmental agency for approval.

In one collaborative initiative, Silica has signed up for the development of Michelin's "Total Performance" tires, which are capable of reducing fuel consumption by 0.2 to 0.3 liters per 100 km (almost 10% of the required total contribution). The highly dispersible silica produced by Silica promises to make a major contribution to the reduction of tire rolling resistance and will be incorporated in new technology designed to achieve a radical improvement over currently available "green" tires.

#### "Tech Day" co-hosted by Engineering Plastics and Specialty Polymers

Following a format similar to "Technical Days" held in the past at PSA, Valeo, BMW and Hyundai, a team of plastics experts from both Engineering Plastics and Specialty Polymers gave in-depth presentations about Solvay's high-performance plastic and elastomeric materials to our international automotive system supplier Mann+Hummel. With an ever-increasing focus on down-sizing engines whilst maintaining power outputs, the demands placed on raw material inputs continue to increase, both in terms of higher operating temperature and pressures.

## Acquisitions

Specialty Polymers expanded its offering with the acquisition of Ryton PPS Business (polyphenylene sulphide) from US-based petrochemical company Chevron Phillips Chemical. Ryton® PPS has a strong share in the automotive sector, replacing metal parts to make cars lighter and more energy-efficient. Other worldwide leading positions are in electronics, where it enhances the fire resistance of components, and in extending the lifetime of filter bags used to reduce pollution at coal-fired power stations.

## Venture Capital & Start-up

Solvay's partner venture funds continued to invest in Cleantech companies, notably:

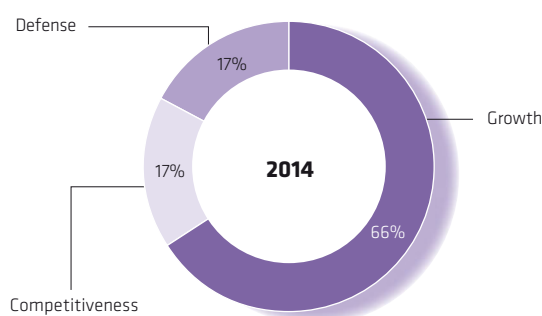
- Aster Capital in the Cosmo Company (smart cities) and Digital Lumens (intelligent LED lighting fixtures);
- Capricorn Cleantech continues to support its successful companies with follow-on investments, e.g. in Avantium (bio-based chemicals), Green Biologics (biobutanol) and Novopolymers (PhotoVoltaic encapsulants);
- The Korean fund invested in Chemtros (compounds for lithium batteries) and Nano (emission control catalysts);
- Phoenix Venture Partners invested in Imprint Energy (thin-film batteries) and NBD Nano (bio-mimetic coating materials);
- Green Seed Fund made a follow-on investment in MetGen (enzymes for lignocellulosics conversion);
- Solvay partner funds saw a total of eight portfolio companies awarded a TOP 100 listing by the Cleantech Group.

Investing in startups gives Solvay access to new and complementary high-tech expertise in fields identified as strategic for the Group, such as renewable chemistry, printable electronics, sustainable energies or advanced materials and formulations.

Solvay Corporate Venture team introduced over 120 startups to Solvay Businesses, Corporate R&I or Strategy in 2014.

## 1.3. Innovation main figures

### Expenditure amounts in innovation



**Perimeter:** Solvay financial perimeter.

**Legend:** R&I expenses include all expenses, whether related to the support of existing products or production processes or to the development of new products or processes as well as to exploratory projects. These not only include actual labor material costs and outsourced R&I but also infrastructure, depreciation of R&I equipment and intellectual property costs and they are net of R&I tax credits and subsidies. This indicator does not include investments in start-up companies or capital expenditures.

Research and Innovation costs amounted to € 247 million in 2014 with an increase of 4% compared to prior year thanks to the reinforced research efforts of the Business Units. The ratio of research and development costs to net sales remained stable at 2.3%.

The global expenditure analysis clearly underlines that innovation projects are globally widely focused on growth, with two-thirds of total expenses dedicated to projects focused on this strategic purpose.

To anticipate the future, a major investment of € 71 million has been dedicated to developing formalized ideas into new innovation project proposals of all kinds.

Around 40% of overall R&I spending is channeled into the development of advanced materials with high added value, providing unique solutions to high-growth markets such as energy, medical applications, sustainable mobility and mobile devices.

The Group dedicates 20% of total R&I expenditure to Corporate activities.

## Research & Innovation staff

	2014
Number of persons employed	1,950

**Perimeter:** Solvay financial perimeter.

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

Throughout the Group, about 1950 people work in R&I. Solvay's 15 major R&I centers are located in Europe, Asia, North America and Latin America.

Solvay enhanced its R&I footprint in 2014, in particular with:

- the new R&I center at the Ewha University in Seoul, South Korea, with the creation of an OLED application lab in Korea;
- the Novocare R&I Hub in Singapore;
- the inauguration of the Open Innovation Center Axel'One in Lyon, France;
- the investment in the Industrial Biotechnology Lab at RIC Paulinia, Brazil.

## Intellectual Property agreements

	2014
Intellectual Property (IP) agreements & cooperation agreements	1,608

**Perimeter:** Solvay financial perimeter.

The number of agreements is very important, highlighting the openness of Solvay's innovation strategy (cf. chapter on Open Innovation page 43).

## Innovation output – Patents

	2013	2014
First Patent Filings	232	259

**Perimeter:** Solvay financial perimeter.

The Intellectual Property strategy is leveraged through strong partnerships between the Intellectual Assets Management Function (IAM) and both the GBUs and the R&I Function. The number of patent applications filed confirms the Group's strong trend towards more patented innovations.

## New sales ratios

	2012	2013	2014
New Sales ratios	23%	22%	21%

**Perimeter:** Solvay financial perimeter.

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

- Products modified either significantly or moderately with a new characteristic as 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 from a new or significantly improved process that provides a new usage value for the customer.

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

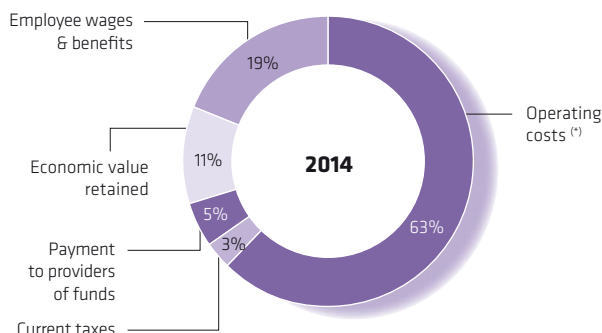
The date used to measure the age of new products of less than five years is the date of effective significant commercialization (the date when the category of new product reaches an annual sales volume over € 100,000).

## 2. Economic performance

### G4-EC1

#### Direct economic value generated and distributed

##### → 2014 Distribution of generated value



**Perimeter:** Solvay financial perimeter.

\* Excluding salaries and benefits, amortization and depreciation.

#### Human capital return on investment

	2013	2014
Total Revenue (in € million)	10,150	10,629
Total Operating Expenses including depreciation (in € million)	7,644	7,954
Total employee-related expenses (salaries + benefits) (in € million)	1,947	1,990
Resulting HC ROI	1,3	1,3
<b>TOTAL FTES</b>	<b>29,389</b>	<b>25,438</b>

As to figures:

- Figures are based on annual reports;
- Revenues are the "Net Sales" as defined in the annual report 2014;
- Operating Expenses have been calculated by deducting "REBITDA" (Return on Earnings Before Interest, Taxes, Depreciation and Amortization from Net Sales. The REBITDA has been published consistently over several years; it is audited);
- Development of the index is influenced by evolution of revenues within the economic cycle, on revenue side and financial perimeter compared to adaptation of workforce and employment cost.







# 5.

# Environment

1. Environmental management	50
2. Materials	51
3. Energy	53
4. Water	55
5. Biodiversity	57
6. Emissions	58
7. Effluents and waste	64
8. Soil management	68
9. Products and services	69
10. Transports	71

# 1. Environmental management

## G4-DMA on overall



G4-14

For Solvay, protection of the environment is a key prerequisite for doing business. It is part of its Sustainable Development policy and its commitments to ICCA's Responsible Care® Global Charter, which was first signed in 1992 then re-signed in 2014.

The Group's approach to environmental management is mainly twofold: sites draw up and deploy improvement plans according to the Group Environmental roadmap and local constraints, and they maintain their management systems, seeking external certification under the various verification schemes.

In order to further improve Solvay's overall environmental performance, sustainability targets for 2020 are being pursued. They cover air and water emissions, waste management, water and energy consumption. Regarding greenhouse gas emissions, priority is given to improve the energy efficiency of production processes with realistic targets compatible with the need of a heavy industry.

The following 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.

Group management systems, procedures, programs and tools support site management, 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 countries where Solvay has significant manufacturing activities.

As it is a major player in the chemical industry, Solvay's operations potentially have other impacts on ecosystems apart from environmental emissions. Significant volumes of water are withdrawn from the natural environment as well as large quantities of non-renewable raw materials and mineral and fossil fuels. A dedicated program is under way for sites that are located in water stress situations, with the aim being to achieve sustainable resource utilization.

### ■ Responsibility along the value chain

Screening suppliers for their sustainability performance is a key aspect that has recently been developed in order to build more Sustainable Supply Chains, while product stewardship, with its various components, has been under way for a long time to ensure product safety throughout the product life-cycle.

## Environmental management systems

Group policy requires all industrial sites to have such a system in line with Group standards. In 2014, 102 manufacturing sites have a standardized Environmental Management System (EMS) in place. The Group policy indeed requires all industrial sites to have such a system in line with

Group standards by 2018. An increasing proportion of sites have obtained external certification of their EMS in 2014.

## Solvay's new management system

In 2014, the Group has developed and tested the new "Solvay Care Management System" (SCMS), which aims at encompassing the management of environmental aspects, health, safety, and quality. This in-house system will be deployed in the coming years, allowing sites to simultaneously fulfill all requirements of the three international standards ISO 9001, ISO 14001 and OHSAS 18001. The SCMS, fully compliant with ISO 14001, allows external certification to be obtained. After training sessions for 12 sites in the 4 zones, as a tool for continuous improvement, the new Group HSE Management System will be progressively deployed in the Group's operations in 2015 and 2016. The SCMS should also allow GBUs to get multi-site external certifications.

The Solvay's new management system will:

- covers the seven HSE domains (occupational safety, process safety, environment, industrial hygiene, health, product stewardship and transport) as well as quality. A more extensive reference system dedicated to product management, the PSMS (Product Stewardship Management System), is being developed;
- incorporates the requirements of ISO 9001, ISO 14001, OHSAS 18001, ISO TS 16949, and RCMS;
- supplies, for every requirement, four maturity levels, from the basic mandatory level to operational excellence, with level one, corresponding to regulatory compliance.

### → Deployment of environmental management systems

	2013	2014	Planned 2018
Manufacturing sites with management system	77%	82%	100%
Manufacturing sites with management system externally certified	-	56%	+ 13 sites

**Perimeter:** Solvay financial perimeter plus all additional manufacturing sites under operational control.

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

## Environmental improvement plans and awareness

In 2014, 91 manufacturing sites or 76% of the total Group sites have had environmental improvement plans reviewed, with 41 sites planning significant further reductions of emissions within the next three years. Including R&I centres, 110 sites or 92% of total Group sites regularly organized sessions for their personnel to raise environmental awareness.

For more details on environmental improvement programs, the reader is referred to the following sections:

- Raw materials: page 51;
- Water: page 55;
- Biodiversity: page 57;
- Emissions: page 58;
- Effluents and waste: page 64.



## Regulatory Compliance

All Solvay industrial sites are required to implement an effective process to check compliance with all applicable laws, regulations and permits, and to document that compliance. 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 separate process.

## 2. Materials

As a large chemical manufacturer, Solvay uses large quantities of raw materials stemming from a range of suppliers and sources. Over 10 million tons of raw materials were used or purchased in 2014.

The majority of mineral raw materials are available on earth in very large quantities. This applies, for example, to calcium carbonate, a key raw material for manufacturing sodium carbonate.

The Solvay group also transforms large quantities of petrochemicals.

In addition, bio-sourced raw materials are increasingly being used and currently represent a significant proportion of raw material usage.

### G4-DMA on materials



#### Bio sourced raw materials

Solvay has been active in exploratory studies and industrial projects based on bio-sourced raw materials or combustibles for more than 15 years. Various projects have been implemented that rely on 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. With its EPICEROL® process, based on natural glycerin, Solvay currently runs one of the world's largest renewables activities in terms of volumes of bio-sourced chemicals produced.

Solvay's policy on bio-sourced raw materials is:

- to explore and deploy the technical value and long-term competitive potential of bio-sourced renewable raw materials, carefully assessing their acceptability with regard to biodiversity and ecosystem protection;
- wherever relevant, to ensure that bio-sourced raw materials are supplied from sustainable, certified sources.

Although bio-sourcing remains marginal in chemical manufacturing when compared with the needs of the bio-fuel industry (and, of course, the wood and agro-food sectors), the Group is willing to utilize bio-sourced raw materials that do not compete with the food chain and are from certified suppliers whenever feasible.

#### Main bio-sourced materials

The main bio-sourced materials used are:

- Glycerin, a by-product of the production of fatty esters from vegetable oils (soybean, palm); it is used as raw material in the manufacture of epichlorohydrin through a new process demonstrating a significantly cleaner path than traditional processes;
- Wood, for the manufacture of cellulose acetate;
- Ethanol, obtained from straw and sugarcane bagasse, used to produce oxygenated solvents for paints and varnishes.

For bio-sourced energy, please refer to the Greenhouse Gas section (see G4EN15 page 59).

## Suppliers

Raw material sustainability is considered as well as the sustainability of suppliers. Solvay currently does business with a total of over 45,000 suppliers. The share of critical suppliers is 55% (high volume, critical supply, critical components). These are identified by domain and by region.

For more details about Solvay's supply chain management, the reader is referred to the pages 29-32.

## G4-EN1 Materials used by weight or volume

### Non bio-sourced and bio-sourced raw materials

→ Materials purchased (1,000 tons)

	2013	2014
Minerals	4,247	<b>4,910</b>
Biosourced product (agro- & animals-based)	403	<b>426</b>
Natural Gas	1,573	<b>1,862</b>
Petrochemicals	2,638	<b>2,625</b>
Others	295	<b>382</b>
<b>TOTAL</b>	<b>9,156</b>	<b>10,205</b>

*Perimeter: Solvay financial perimeter – all raw materials spending (gas and other raw materials used as energy sources excluded, reported as energy purchases).*

Solvay has increased its bio-based raw-material sourcing. Examples are Augeo 191 (a solvent for coatings sourced from soybean oil), Rhodapex 70 NAT (a surfactant for shampoos and shower gels made from sugarcane or palm kernel oil), Technyl eXten® (a plastic polyamide for automotive applications), and Kalix (a high-performance polyamide derived from castor oil), as well as the continuous development of guar gum for industrial viscosifiers.

### Towards renewable chemistry

To develop renewable chemistry Solvay is paving the way for technologies that promote the use of renewable raw materials: new bio-based compounds, recycling processes. Bio-sourced raw materials fall within the first of Solvay's four R&I axes, which are: Renewable chemistry (renewable or recycled raw materials); Advanced materials; Sustainable energy; and Eco-processes.

Bio-sourced raw materials are not only used as an alternative, competitive source of raw materials, but also for reasons linked to local availability or functionalities not encountered in raw materials of fossil origin. The objective is to exploit the benefits of new raw-material bio-sourcing when economically, ecologically and socially viable. Such benefits may be:

- New chemical functionalities provided by the bio-sourced molecules;
- Alternative source for scarce/costly raw materials;
- Long-term reduction of fossil fuel consumption and the associated greenhouse gas impact of Solvay's activities (cradle-to-gate) through raw material or energy sourcing.

#### Striving for responsible bio-sourcing

Solvay privileges a responsible sourcing of bio-sourced raw materials, which currently account for around 420,000 tons or 4% of raw material usage. Although this is still a small proportion, this covers numerous projects that rely on bio-sourced materials. Solvay is striving to promote responsible sourcing.

Solvay promotes certified suppliers.

### Best practices

#### Vegetable glycerin

Solvay promotes the emergence of harmonized certified systems for bio-based oils (RED, Fair trade, RSB, RSPO, RTRS, etc.).

For example, the glycerin used in the EPICEROL® process (to manufacture epichlorohydrin) is a by-product from the oleochemical and biodiesel industries. These industries mainly use vegetable oils from rapeseed, palm and soybean. Solvay strives to buy glycerin that comes from certified raw materials.

- The rapeseed oil-based glycerin obtained from the European oleochemical and biodiesel industries complies with the sustainability criteria imposed on biodiesel by the European Directive on renewable energy.
- The glycerin derived from Southeast Asian palm oil is supplied by members of the Round Table for Sustainable Palm Oil (RSPO).
- The glycerin derived from Latin American soybean is sourced from suppliers who are committed to sustainable agricultural practices (*i.e.* excluding deforestation, child labor and the irresponsible use of pesticides).

#### Sourcing wood pulp for cellulose production

In the relationship with our wood-pulp suppliers, Solvay contractually ensure their adherence to the highest international environmental and

social standards, starting from their wood sourcing and continuing through to production of the dissolving wood pulp Solvay buy from them. Consequently all of these suppliers and their wood contractors have been (or, in one case, will shortly be) certified according to FSC, PEFC or SFI standards. This ensures that their sourcing and production comply with the following key principles:

- Adherence to all applicable laws and international treaties;
- Recognition of and respect for the rights of indigenous people, collaborators and forest workers;
- Reduction of the environmental impact of logging activities and maintenance of ecological functions;
- Integrity of the forest and promotion of the restoration and conservation of natural forests.

#### Ethanol in Latin America for Coatis

All suppliers under contract to Solvay Coatis (which manufactures oxygenated solvents, phenol-based products and derivatives) are members of the industry association UNICA, which co-runs Bonsucro, the Better Sugar Cane Initiative. This is a certification program in the Brazilian sugar cane market which encompasses several sustainability aspects. Contracted suppliers either have or are obtaining all the listed certificates (FSSC 22000, OHSAS 18001, ISO 9001 and 14001). In other cases (spot purchases), best efforts are made to buy from companies with the same practices.

#### How Novacare sources bio-materials

Novacare has a deep-rooted commitment to sustainable sourcing. Internal strategies are committed to procuring oleochemical derivatives from approved sustainable sources. By 2015, the intention is to procure oleochemicals and derivatives from approved sustainable sources *i.e.* RSPO member. Sustainability is built into the purchasing process and collaborations with key partners continue to drive improved transparency, thereby increasing traceability possibilities (mass balance, segregation, etc.) from the farm to the consumer market and responding to the current challenges facing the industry. By 2020, we aim to achieve full mass balance and/or segregation. We choose sustainable raw materials whenever they are available.

In Europe, Novacare is member of RSPO. We buy coconut derivatives that are fully sustainable. We also buy palm/PKO derivatives and are aware of the sustainable options (mass balance, segregation, etc.).

## G4-EN2

### Percentage of materials used that are recycled input materials

#### Recycled input materials

There is no consolidated data.

Solvay contributes to the reuse of third parties' secondary raw materials (urban mining, industrial ecology, bio-sourcing, etc.), taking into account the overall life-cycle assessments.

For more details about End-of-life product recycling, the reader is referred to the page 70.

Internal recycling is an inherent feature of the chemical industry, with multiple closed loops (not to mention water and energy loops) and recovery of intermediates.



### 3. Energy

#### G4-DMA on energy



Solvay has set one long-term objective regarding primary energy consumption: to improve by 10% by 2020 the energy efficiency of production processes. This will be done through realistic solutions that are compatible with the specific energy requirements of the chemical industry.

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 such as the recent purchases of two cogeneration units, one in Belle Étoile (France) and one in Torrelavega (Spain), or the retrofit of the cogeneration unit in La Rochelle (France) or in partnerships and contractual arrangements extending over long periods, such as the Exeltium consortium.

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

#### G4-EN3

#### Energy consumption within the organization

##### → Fuel consumption from non-renewable sources (Absolute)

	2012	2013	2014
Petajoules (Low Heating Value)	99	101	100

**Perimeter:** Solvay financial perimeter. In order to enable comparison over time, the figures from previous years have been restated to take into account the change in the consolidation rules.

**Legend:** This indicator reflects the primary energy consumption during a given year related to manufacturing activities of companies currently consolidated (fully or proportionately).

##### → Fuel consumption from renewable sources

	2012	2013	2014
Petajoules (Low Heating Value)	< 0,1	< 0,1	5.8

**Perimeter:** Solvay financial perimeter. In order to enable comparison over time, the figures of previous years have been restated to take into account the change in the consolidation rules.

**Legend:** This indicator reflects the primary energy consumption during a given year related to manufacturing activities of companies currently consolidated (fully or proportionately).

In 2013 Solvay built a new biomass-fired cogeneration plant at Brotas in Brazil. In 2014 this new plant was operated close to its nameplate capacity.

Since both steam and electricity are either generated on-site from fuels or purchased from third parties, the final electricity and steam consumptions are reported here, to avoid double counting of primary energy consumptions.

#### Energy consumption



	2012	2013	2014
Energy consumption (Petajoules Low Heating Value)	179	181	180

**Perimeter:** In order to enable comparison over time, the figures from previous years have been restated to take into account site movements and change in the consolidation rules. In 2014, the primary energy consumption of the companies in the financial perimeter represents 68% of the total energy consumption of all companies in the operational perimeter.

**Legend:** This indicator reflects the primary energy consumption during a given year related to manufacturing activities of companies currently consolidated (fully or proportionately).

#### Standards, methodologies, and assumptions used

Solvay's energy reporting is in line with the World Business Council for Sustainable Development (WBCSD) "Guidelines for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain".

Energy consumption has three components:

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

These three components are converted into primary energy in order to arrive at total energy consumption in petajoules (PJ) low calorific value, using the following conventions:

- Fuels: using the net calorific values;
- Purchased steam (assuming an efficiency of 90%), based on the net calorific value of the fuels used for its generation;
- Purchased electricity (assuming an average efficiency of 39.5% for all types of power production from fossil fuels and 33% for nuclear power), based on net calorific value (source : International Energy Agency).

#### Source of the conversion factors used

**For purchased fossil fuels** such as coal, anthracite and natural gas, the energy content was considered equal to the net calorific value of the fuel. The same assumption was made for fuels such as coke, petroleum coke and fuel-oil, even though they are not primary energy sources but secondary energy, being produced in transformation processes (from coal and oil, respectively).

The net calorific value of the fuels is determined using data provided by the fuel suppliers or data from specific analytical reports. In the case of sites for which those data are not available, the following standard values are used to convert the quantities of energy vectors expressed in mass or volume unit into energy.

- Solid biomass 8.4 GJ<sub>p</sub>/metric t
- Refuse derived fuel 15.1 GJ<sub>p</sub>/metric t

- Coal 25.1 GJ<sub>p</sub>/metric t
- Petroleum coke 31.5 GJ<sub>p</sub>/metric t
- Anthracite 28.2 GJ<sub>p</sub>/metric t
- Coke 31.5 GJ<sub>p</sub>/metric t
- Natural gas 11.296 kWh (GCV)/m<sup>3</sup>
- *N.B.: GJ<sub>p</sub> means GJ primary energy*

**For purchased steam**, the primary energy content is determined with reference to a gas-fired boiler (respectively coal-fired boiler) with a global energy efficiency of 90% (Respectively 88%) based on the net calorific value.

**For purchased electricity**, the primary energy content is defined according to how the electricity is produced.

For electricity generated from fuels, determination of the primary energy content of the electricity purchased is based on the worldwide global electricity generation efficiency published by the International Energy Agency (IEA), which is currently 39.5% based on the net calorific value. With a conversion factor of 3.6 GJ/MWh, the primary energy content of electricity is equal to 9.1139 GJ<sub>p</sub>/MWh<sub>elec</sub>, and is obtained by dividing the secondary energy content of 3.6 GJ/MWh<sub>elec</sub> by 39.5%, the reference value for power plant efficiency.

For electricity generated from specific renewable energy sources such as hydro, wind, solar or geothermal, there is no direct consumption of fuels. For those generation technologies, the primary energy content is defined by convention by the International Energy Agency.

### Hydro, wind or solar electricity

By convention, the “primary” energy content of hydro, wind or solar electricity is defined as the energy value of the electricity itself, assuming an energy efficiency of 100% for the generating device, giving a value of 3.6 GJ<sub>p</sub>/MWh<sub>elec</sub>.

### Geothermal electricity

The “primary” energy content of geothermal electricity is defined as the heat output of the capturing device. In case of missing data on heat consumption, the primary energy content is calculated by assuming an energy efficiency of 10% for the generating device, giving a value of 36 GJ<sub>p</sub>/MWh<sub>elec</sub>.

### Specific case for electricity produced from nuclear sources

The physical energy input to nuclear electricity should, in principle, be defined as the heat released by reactors during the accounting period. In practice, according to a convention set by the International Energy Agency the primary energy equivalent of nuclear electricity is calculated from the gross electricity generation by assuming a 33% conversion efficiency. Based on this assumption, the primary energy content of nuclear electricity is equal to 10.909 GJ<sub>p</sub>/MWh<sub>elec</sub>.

### Note

According to the GHG protocol, the energy footprint of purchased energy that is resold to a third party without any transformation must not be included in the energy reporting. In that case, the primary energy content of energy purchased and resold is set at 0.

## G4-EN5

### Energy intensity

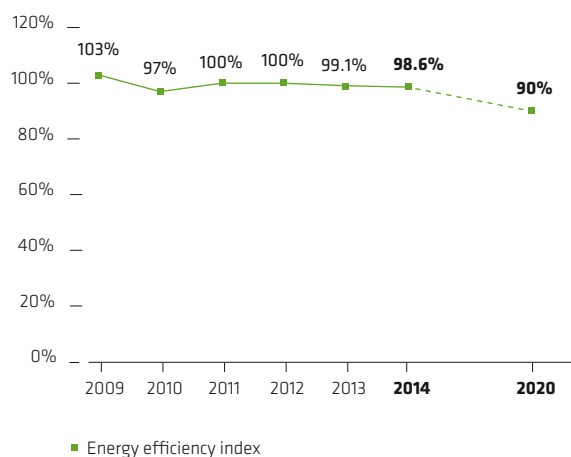
#### Solvay's 2020 target\*:

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

\* Base 2012 at constant activity perimeter.

The energy intensity covers primary energy of fuels (coal, natural gas, fuel oil...) and of purchased steam and electricity.

#### → Energy efficiency



**Perimeter:** Solvay financial perimeter.

**Legend:** Energy index “at constant activity perimeter” reflects the change in energy consumption on a comparable basis after correcting the historical perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.

The following principles are applied when calculating the energy intensity indicator. For an accurate comparison, we calculate what the primary energy consumption would have been if we had produced the same quantities during the reference year 2012 as during the year under consideration with the efficiency of the reference year. We compare the result with the actual primary energy consumption for the year under consideration. The energy intensity indicator expressed in percentage is the ratio between the actual primary energy consumption and the reference primary energy consumption, both expressed in petajoules.

The energy intensity ratio takes into account all forms of energy (fuel, electricity, heating, cooling and steam). The energy intensity ratio takes into account only primary energy consumed within the organization.

## G4-EN6

### Reduction of energy consumption

Compared with the baseline 2012, the reduction in primary energy consumption amounted to 2500 TJ in 2014.

The Group has reduced its overall energy intensity by 4% since 2009. Solvay Energy Service optimizes the energy purchases of the Solvay Group, which amount to € 0.9 billion per year, and helps business units and production sites to manage their energy requirements. Key factors in this progress are the SOLWATT® project (aimed at improving the energy efficiency of manufacturing processes) and the manufacturing excellence approach. In 2015, within the SOLWATT® project, energy performance contracts will be signed between Solvay Energy Services and the GBUs to ensure the implementation of the findings of the energy audits.

Three parallel approaches are followed:

- Improving the generation efficiency of secondary energies such as steam and electricity by developing the use of high-efficiency cogeneration plants. Even though cogeneration is already well deployed within the Group, new cogeneration projects are now being considered in Europe, the US and India;

- Solwatt, the internal “pole of excellence” in energy efficiency, aims to identify and implement energy savings in existing manufacturing units via technology improvements and management behavior. This project will be extended to include all of the sites concerned, which will be evaluated by end 2015;
- New or remodeled plants are optimized for energy consumption and generation.

For example, deployment of the operational excellence program in sodium carbonate manufacturing plants has been continued in 2014. It was decided to invest in a new cogeneration unit based on a gas-fired engine in Oldbury (UK) to replace conventional boilers. Other improvements have also been adopted, such as a new cogeneration unit at West Deptford (USA). New cogeneration units are being investigated (e.g. in Map Tha Phut (TH), Ospiate (IT), and Porto Marghera (IT)).

For the future, technological breakthroughs will improve the global energy efficiency of Solvay's operations. Having built hydrogen peroxide (HP) mega-plants in Antwerp (BE) and Map Ta Phut (TH), Solvay has begun constructing one of the world's most efficient HP plants in the Kingdom of Saudi Arabia.

## 4. Water

### G4-DMA on water



In some areas seasonal water can impact local eco-systems and result in increased competition between uses. Thirty of the Group's sites have been identified as being potentially at risk of water shortage according to standard water-risk screening tools (*i.e.* located in areas where the annual freshwater renewal rate will drop below 1,000 m<sup>3</sup>/capita/year).

These sites are identified as being under potential hydric stress. Eleven of them have suffered water scarcity episodes in recent years and three had to slow down production: In Map Ta Phut (Thailand, 2005) and Rosignano (Italy, 2011/2012) activities have been affected by drought periods and it was necessary to find alternative water sources to ensure operational continuity. In a more recent crisis, some production operations involving open water circuits had to be stopped for three weeks at the Paulinia plant (Brazil).

Solvay's water policy is:

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

### Water reporting – CDP Water

Solvay is one of the companies fully engaged in the recently launched worldwide “CDP Water” reporting scheme. CDP (the Carbon Disclosure Project) has thanked Solvay for disclosing critical water information this year. Disclosing to CDP supports the important work to catalyze action on corporate water stewardship and safeguard global water resources. CDP water relies on a detailed, reliable internal reporting system.

## G4-EN8

### Total water withdrawal by source

#### Water intake

##### Solvay's 2020 targets\*:

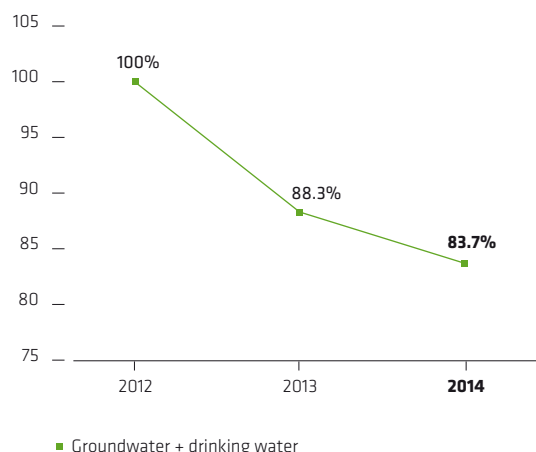
- **10 % reduction (1.3% per year) in the withdrawal of groundwater and drinking water;**
- **implementing sustainable water management at 100% of our sites under water scarcity risk.**

\* Base 2012 at constant activity perimeter

In addition to site-specific objectives, the Group is pursuing its overall 2020 targets (especially in water scarcity areas) with a view to limiting the abstraction of groundwater (because this water is not returned to its original environmental compartment) and decreasing the dependency on drinking water, which is still used too often because there is no alternative.

### Performance progress indicator

#### → Water consumption index (Base 100 in 2012)



**Perimeter:** Solvay financial perimeter.

**Legend:** Water consumption index at constant activity perimeter means that the absolute performance is corrected for changes in production volumes and for site entering or leaving the Group perimeter.

By the end of 2014, the achieved performance for the “sum of drinking and groundwater” indicator had already reached the level of the Group's 2020 target: The performance at constant perimeter for the “sum of drinking water and groundwater” indicator improved by 4.6% in 2014 compared with 2013. This brings the overall improvement since the reference year 2012 to 16.3%.

The target which was set by the Group in 2012 was to achieve an improvement of 10%. This target has already been achieved in 2014. Improvement stems from numerous water saving and recycling programs.

#### → Absolute intake (1,000 m<sup>3</sup>)



	2012	2013	2014
Groundwater + drinking water	222,868	204,743	192,790
Intake of estuary and sea water	84,039	89,617	82,311
Intake of surface water	344,081	352,727	344,983
Intake of groundwater	205,530	187,668	178,245
Water intake from auxiliary sources	7,401	9,901	8,251
<b>TOTAL WATER INTAKE</b>	<b>659,026</b>	<b>657,621</b>	<b>628,501</b>

**Perimeter:** Solvay financial perimeter.

**Legend:** Water intake = water withdrawals = water abstracted from the environmental compartments, not corrected for the quantities returned to the natural environment.

### Sites at risk of water scarcity



Following an internal study carried out in 2014, focusing on 28 pre-screened sites using global tools (WBCSD's Global Water Tool and WRI's Aqueduct tool), 13 sites were confirmed to be potentially confronted with water scarcity risks; four of them already demonstrating implementation of sustainable water management.

#### → Water management at sites

	2014
Sites with detailed water balance (Solvay Way practice)	79 sites (66%)
<b>TOTAL SITES IDENTIFIED BY SCREENING TOOLS AS POTENTIALLY AT WATER RISK</b>	<b>28</b>
Sites for which the water scarcity risk was not confirmed	16
Sites for which the water scarcity risk was confirmed	13
Of which sites confirmed for water scarcity risk but risk already mitigated (Sustainable Water Management)	31%

**Perimeter:** Solvay financial perimeter plus all additional manufacturing sites under operational control.

Action plans to reduce water withdrawals focus primarily on sites using drinking water and/or groundwater and on sites located in regions affected by water stress. Many sites have programs under way that reduce water consumption and susceptibility to water scarcity episodes, in particular: action plans to reduce water withdrawal (20 sites); water storage tanks (11 sites), open-loop cooling circuits (17 sites), recycling wastewater from external companies or third-party waste-water treatment plants (5 sites).

#### For example:

- the Baotou plant in China located in a region of water scarcity, has made very significant improvements in recent years, reducing its relative water intake from 250 m<sup>3</sup>/tons in 2012 to 138 m<sup>3</sup>/tons in 2014, a reduction of almost 45%;
- in Panoli, India, it has been possible to increase production capacity while keeping water intake stable, resulting in a 5% improvement in specific consumption (2012-2014).

## G4-EN9

### Water sources significantly affected by withdrawal of water

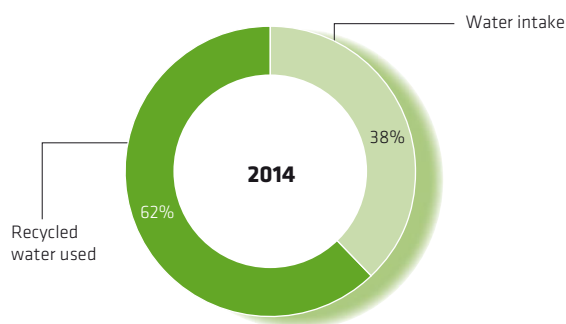
The global water tools used by Solvay privilege a global assessment by river basin. Solvay's reporting relies on tools that measure a series of water scarcity factors.

Indicator: There is no definition of significantly affected water sources. Sites generally rely on various interrelated sources that share the same water basin.

## G4-EN10

### Percentage and total volume of water recycled and reused

#### Water recycling



**Perimeter:** Solvay financial perimeter.

**Legend:** Without any changes in activity perimeter.

Most of the sites concerned are equipped with closed-loop cooling systems, meaning that the volume of recycled water is equivalent to Solvay's overall water intake.

#### Exemplary projects

##### Water from treated groundwater in Australia

To reduce the use of potable freshwater in the dry region of Banksmeadow, Sydney (Australia), the Solvay plant has substituted potable city water with non-potable water from the nearby Orica Treatment Plant, which treats contaminated groundwater from the Botany aquifer, for use in various water applications on site. This has

more than halved the site's usage of scarce urban water. The use of the treated groundwater has required more sophisticated control of treatment chemical levels within the cooling water circuit and changes to the operation of the demineralized water unit. The Orica Treatment Plant has a projected life of over 30 years and consequently provides the Solvay site with a long-term sustainable source of non-potable water.

##### Monterrey, a Mexican site in a very arid area

The site is located in a very arid zone. Consequently a municipal wastewater treatment plant water recycling project has been promoted and completed with support from Solvay and other local companies. Today 90% of the site's industrial water needs (115,000 m<sup>3</sup>/yr) are supplied via this recycling project, instead of using groundwater. Water issues must nevertheless continue to be managed very efficiently in this area.

##### Panoli site (India) brings significant water savings

An industrial scheme has been set up to reuse up to 80% of waste water from the plant, especially as cooling water makeup and boiler feed water. The site has succeeded in doubling its PEEK production capacity and stabilizing 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 allows for multiple reuses. Thanks to a treatment and recycling operation, 35% of water is now taken from contaminated groundwater, instead of using good quality surface water.

##### Water savings in Vernon (United States)

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. By redefining washing conditions it was 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 m<sup>3</sup> water was saved, representing a 20% reduction in water use.

## 5. Biodiversity

### G4-DMA on biodiversity



Solvay is committed to reducing the possible impacts on biodiversity that result from its operations and the use of its products. As regards operations, Solvay's strategy is to continue reducing all impacts that could affect biodiversity (air and water emissions, water withdrawals) and to manage natural areas around its sites with the objective of developing biodiversity. As far as products are concerned, Solvay relies on life-cycle assessment tools:

- for water withdrawals see page 55;
- for air emissions see page 58;
- for water emissions see page 64;
- for impact of products via life-cycle assessments see page 69.

### Management of natural areas

Sites exploiting large areas, quarries and settling ponds develop adapted plans, including large-scale management and rehabilitation programs. In particular, the rehabilitation of limestone quarries and settling ponds (for mineral residues) after shutdown has been a continuous process for several decades.

Around a series of sites, Solvay also owns and maintains large natural areas that are to a great extent protected from housing or road development. The sites concerned manage these areas in a way that contributes to biodiversity protection. The goal is to have these rehabilitated areas recognized and protected as nature reserves.

Solvay is committed to developing collaboration with NGOs and third parties in order to manage natural areas around its manufacturing operations and fosters collaboration with third parties around its sites, for example by allowing farmers or others to use its land.

### G4-EN11

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

No operational and standardized definition is available of "Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas". Hence Solvay is not in a position to define and follow an indicator. However, Solvay manages biodiversity on its own premises and the environmental impacts of its operations in order to minimize biodiversity disturbances.

### G4-EN12

#### Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas

No standardized definition is available of "sites adjacent to protected areas and areas of high biodiversity value outside protected areas". Hence Solvay is not in a position to define and follow an indicator.

No Solvay site is located in a protected area. Nevertheless, Solvay is investigating the possibility of mapping biodiversity in the vicinity of its manufacturing sites:

- for water management, page 55;
- for air quality see page 58;
- for water emissions see page 64;
- for impact of products via life-cycle assessments see page 69.

### G4-EN13

#### Habitats protected or restored

##### Natural areas managed by Solvay

	2014
site with significant natural areas	24
surface managed as natural area	16,000 ha
trees replanted	> 170,000 trees

*Perimeter: Solvay financial perimeter plus all additional manufacturing sites under operational control.*

##### Nature rehabilitation programs on 24 Solvay sites

Multiannual, often large-scale, rehabilitation of natural areas is ongoing on 24 Solvay sites. In particular, the biological rehabilitation of old dikes and quarries on Solvay land has been under way for decades. 16,000 ha of land is being actively managed, and often replanted with trees. Some of these rehabilitated areas are already recognized as nature reserves to be protected.

In addition, Solvay owns and maintains natural land around its sites, where biodiversity is most often protected from housing or road development, and this land acts as a natural buffer.

##### Acting with government agency on biodiversity at Tavaux (France)

The replanting of old settling ponds is under way. Other replanting programs are ongoing in collaboration with the firm Geophyte. The Proliphyt project has been selected by the French Environmental Agency under the national "Ecoindustrie" program and implemented in 2014. 8,000 m<sup>2</sup> of an abandoned industrial sediment pond have been replanted with various local species in order to restore the flora and fauna. This project is being led by the SOUPE tree nursery with support from the University of Franche-Comté. After this initial phase, the full project, covering 6 ha, will be deployed.

## 6. Emissions

### G4-DMA on emissions



Solvay's activities result in a continuous release of airborne pollutants. In particular, as a large chemical manufacturer, Solvay generates (directly or indirectly) significant amounts of greenhouse gases. Emissions may contribute to global issues (greenhouse gases, ozone-depleting gases), more regional issues (air acidification, photochemical oxidation formation, etc) or local issues (dust, especially from power generation). Air quality is managed as one of Solvay's "high materiality" issues in relation to sustainability.

However, as regards greenhouse gases in particular, it has been shown that overall, the GHG emissions of the chemical industry are offset by the emissions avoided thanks to its products (more efficient cars, insulation, lighting...).

Solvay's policy is to protect the environment (by reducing emissions, among other measures) and to pursue the goal of doing no harm to people or the planet.

All Solvay industrial sites must deploy Group environmental programs and standards, especially in order to:

- comply with environmental quality standards;
- avoid environmental infringements;
- control and reduce emissions based on impact assessment.



Besides controlling emissions of greenhouse gases with potential impacts on a global scale, Solvay is also committed to improving air quality at the local and regional level, working in close cooperation with local stakeholders according to a set of parameters that impact the environment. These parameters focus on standard pollutants (Acidification Potential, Volatile Organic Compounds, particulates, heavy metals, etc). They will be extended in the coming years in order to better report and manage all potential substances of concern.

For more details about the management of Substances potentially of concern, the reader is referred to page 101.

## Greenhouse gas emissions



Solvay's target is to reduce by 10% its greenhouse gas emissions at constant perimeter and volume.

A structured greenhouse gas emission reporting system, externally verified, and the response to rating agencies such as the Carbon Disclosure Project, helps the Group to align its efforts on the materiality of its greenhouse gas challenges.

## G4-EN15

### Direct greenhouse gas (GHG) emissions (Scope 1)



		2012	2013	2014
Direct CO <sub>2</sub> emissions (scope 1)	MtCO <sub>2</sub>	8.1	8.5	8.7
Other greenhouse gases (Kyoto Protocol) emissions (scope 1)	Mt CO <sub>2</sub> eq	2.6	2.7	2.7
<b>TOTAL GREENHOUSE GASES (KYOTO PROTOCOL) EMISSIONS</b>	<b>MT CO<sub>2</sub>eq</b>	<b>10.7</b>	<b>11.1</b>	<b>11.4</b>

**Perimeter:** Solvay financial perimeter. In order to enable comparison over time, the figures of the previous years have been restated to take into account sites movements and change in the consolidation rules. In 2014, the greenhouse gas emission of the companies in the financial perimeter represents 80% of the total greenhouse gas emissions of all companies in the operational perimeter.

**Legend:** This indicator reflects the greenhouse gas emissions during a given year related to manufacturing activities of companies currently consolidated (fully or proportionately). Solvay's greenhouse gas emissions reporting is in line with the WBCSD "Guidelines for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain".

The increase in the direct CO<sub>2</sub> emissions is mainly linked to the buy-back of some cogeneration units and thus the internalization of steam and electricity generation that was previous outsourced.

## Standards, methodologies, and assumptions used

### Definition of indicators for greenhouse gases

The GHG emissions reported by Solvay correspond to the scope of the Kyoto Protocol and comprise the following compounds/compound families: CO<sub>2</sub>/N<sub>2</sub>O/CH<sub>4</sub>/SF<sub>6</sub>/HFCs and PFCs. The impact on climate change (expressed as teq CO<sub>2</sub>) is calculated using their respective Global Warming Potential (GWP) (as defined by the IPCC) and also taking into account:

- for CO<sub>2</sub>, 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 direct emissions for each GHG released from Solvay's industrial activities (Scope 1 of Kyoto Protocol).

### Source of the emission factors and Global Warming Potential (GWP) rates used

**For CO<sub>2</sub>,** the emission factors of fossil fuels are based on the carbon content of fuels expressed as t C/TJ NCV and then converted into CO<sub>2</sub> by applying the factor 3.664 t CO<sub>2</sub>/t C.

The carbon content of the fuels is determined using data provided by the fuel suppliers or data from specific analytical reports. Where no such data are available for a particular site, the following standard values (expressed in t CO<sub>2</sub>/TJ) are used to convert the quantities of fuels into CO<sub>2</sub> emissions, assuming an oxidation factor of 100%:

- Natural gas: 56.1;
- Fuel oil: 78;
- Coal: 95;
- Petroleum coke: 97;
- Anthracite: 98;
- Lignite: 101;
- Coke: 101;
- Biomass/biogas: 0.

**For other greenhouse gases,** the Global Warming Potential (GWP) rates used are those defined by the IPCC, having converted physical tonnes of emissions into tonnes of CO<sub>2</sub> equivalent.

### Consolidation approach for emissions (scope 1)

Reporting is based on the World Business Council for Sustainable Development's Guidance for Accounting & Reporting Corporate GHG Emissions.

In the spirit of evolution towards Integrated Reporting, consolidation rules and treatment of historical figures are based on financial reporting rules.

## G4-EN16

### Indirect greenhouse gas (GHG) emissions (Scope 2)



		2012	2013	2014
Indirect CO <sub>2</sub> emissions (Scope 2)	MtCO <sub>2</sub>	3.7	3.5	3

**Perimeter:** Solvay financial perimeter. In order to enable comparison over time, the figures from the previous years have been restated to take into account the change in the consolidation rules.

The decrease in indirect CO<sub>2</sub> emissions is mainly linked to the buy-back of some cogeneration units and thus the internalization of steam and electricity generation that was previous outsourced. For indirect emissions (Scope 2), only CO<sub>2</sub> is taken into account.

### Source of the emission factors and Global Warming Potential (GWP) rates used

The indirect emissions of CO<sub>2</sub> are linked with the steam and electricity purchased from third parties (Scope 2 of Kyoto Protocol):

**For purchased steam**, the CO<sub>2</sub> emissions are either calculated with reference to a gas-fired boiler (respectively coal-fired boiler) with a global energy efficiency of 90% (respectively 88%) based on the net calorific. By assuming a specific CO<sub>2</sub> emission factor for natural gas of 56.1 kg CO<sub>2</sub>/GJ NCV, or a specific CO<sub>2</sub> emission factor for coal of 95.0 kg CO<sub>2</sub>/GJ NCV, the CO<sub>2</sub> emissions related to purchased steam are equal to either 181 kgCO<sub>2</sub>/t or 313 kg CO<sub>2</sub>/t, depending on the fuel used to generate the purchased steam.

**For purchased electricity**, the CO<sub>2</sub> emissions are calculated either with reference to the CO<sub>2</sub> emission factor specified in the supply contract or to the CEF published by the power supplier. Where there is no published CEF for the power supplier, the national CO<sub>2</sub> emission factors for electricity generation are used, as published by IEA in the "CO<sub>2</sub> emissions from fuel combustion" statistics.

The consolidation approach for emissions (scope 2) is the same as the consolidation approach for scope 1.

In the spirit of evolution towards Integrated Reporting, consolidation rules and treatment of historical figures are based on financial reporting rules.

## G4-EN17

### Other indirect greenhouse gas (GHG) emissions (Scope 3)

	2012	2013	2014
Emissions related to downstream transportation and distribution of products Mt CO <sub>2</sub>	-	1.07	0.92
Investments (including Discontinued Operations) Mt CO <sub>2</sub>	4.1	3.7	3.6

Emissions reported have been calculated according to the Greenhouse Gas Protocol's Scope 3 Calculation Guidance.

"Investments" include all entities not consolidated in the financial perimeter according to current financial consolidation rules, including Discontinued Operations.

## G4-EN18

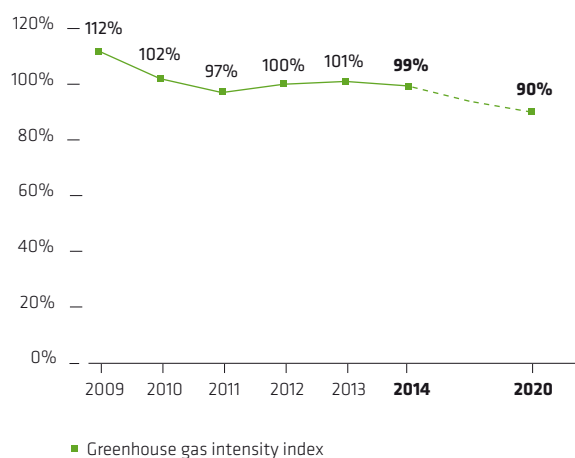
### Greenhouse gas (GHG) emission intensity

#### 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 (Base 100 – in 2012)



**Perimeter:** Solvay financial perimeter.

**Legende:** 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.

The following principles are applied when calculating the greenhouse gas intensity index. For an accurate comparison, we calculate what the greenhouse gas emissions would have been if we had produced the same quantities during the reference year 2012 as during the year under consideration with the CO<sub>2</sub> intensity of the reference year. We compare the result with the actual greenhouse gas emissions for the year under consideration. The greenhouse gas intensity index expressed in percentage is the ratio between the actual greenhouse gas emissions and the reference greenhouse gas emissions, both expressed in tones of CO<sub>2</sub> equivalent.

The greenhouse gas intensity index takes into account the direct emissions (Scope 1) and the indirect emissions (Scope 2). For Scope 1, all the greenhouse gases from the Kyoto Protocol are included in the calculation, whereas only CO<sub>2</sub> is included for Scope 2.

## G4-EN19

### Reduction of greenhouse gas (GHG) emissions

Compared with the baseline 2012, the reductions in GHG emissions amounted to 0.1 MtCO<sub>2</sub>e in 2014.

The Group has reduced its greenhouse gas emissions by 13% since 2009, at constant activity perimeter. This was achieved thanks to the reduction of emissions of fluorinated gases in Bad-Wimpfen (Germany), Frankfurt (Germany) and Onsan (South Korea) and of nitrous oxide in Paulinia (Brazil), Onsan (South Korea) and Chalampé (France). For CO<sub>2</sub> emissions, both the use of recycled wastes as fuels in Bernburg (Germany) or biomass in Brotas (Brazil) and projects aiming to improve the energy efficiency of manufacturing processes significantly contributed to progress in the past years.

The reductions in GHG emissions mainly occurred in Scope 1 (direct GHG emissions). For example:

- 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 t CO<sub>2</sub> per year since 2011. Since 2012 part of the heat from the combustion of the recovered methane has been utilized in the manufacturing process, bringing additional energy and CO<sub>2</sub> savings;
- In Brazil, Solvay Energy Services has developed and operates a biomass-fired cogeneration unit using sugar cane bagasse.

## G4-EN20

### Emissions of ozone-depleting substances (ODS)

#### → Absolute emissions

	2012	2013	2014
Ozone-depleting substances (teq CFC-11)	31.0	34.2	39.6

**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. Emissions without corrections for changes in activity perimeter.

The ozone depletion impact indicator increased by 5.38 teq CFC-11 (+15.7%) compared with 2013. This is despite the completion in 2014 of several retrofits of cooling machines aimed at substituting HCFCs (ozone-depleting substances, mainly R22) for refrigerants with less environmental impact. These projects have been carried out under the European regulatory framework as a consequence of the Montreal Protocol. Indeed, the improvements due to the reduced emissions from refrigerants (R22...) were unfortunately offset by the fact that the impact of N<sub>2</sub>O on ozone depletion was included for the first time\* and technical problems occurred with the N<sub>2</sub>O (nitrous oxide) abatement systems on the sites at Roussillon (France) and Paulinia (Brazil).

\* Following a publication from the WMO, the impact of N<sub>2</sub>O on the destruction of ozone was this year integrated for the first time, for all years.

### Environmental reporting – standards, methodologies, and assumptions used

Substances included in the calculation of ozone-depleting substances, source of the emission factors used: Reference ReCiPe.

#### Solvay Environmental Reporting File

Since 2013, Solvay Environmental Reporting File (SERF) is the unique tool and template at Group level for collecting:

- Emissions to air and/or water, with the exception of CO<sub>2</sub> emissions;
- Wastes (industrial/construction & demolition/mining/domestic);
- Water related parameters (intakes/uses/releases/losses) from all industrial sites under operational control of Solvay and from all Research & Innovation Centers. SERF covers several hundreds of substances. In contrast with some international public emission reporting systems (such as the European PRTR), there are no reporting thresholds for SERF.

Full SERF reporting is mandatory for all entities belonging to the operational perimeter. The list of sites included in the operational perimeter is reviewed annually. Joint Ventures 50/50 under a joint operational control normally do not report to SERF (such as the sites Simoes Filho and Osasco belonging to the GBU "Plastics Integration"). However, given the importance of the environmental impact of the entities belonging to the GBU "Chlorovinyls Pole" (BU's "Chlorchemicals" and "SolVin") – which will be transferred to the Joint Venture 50/50 between Solvay and Ineos (INOVYN)-, they continue to report to SERF.

Operational control is defined according to the Greenhouse Gas Protocol, i.e. "a company has operational control over an operation if the former or one of his subsidiaries has the full authority to introduce and implement its operating policies at the operation". Typically, sites under operational control are runned/managed by Solvay personnel and the Group has generally 50% or more of the shares.

The impact indicators calculated are used for the follow-up of the environmental impact of industrial activities and, in particular, to measure progress towards the emission reduction targets set for the Group.

Since 2012, the environmental impact indicators and additional Sustainable Development indicators published externally are calculated based on the Group financial perimeter. This ensures a better consistency between financial and non-financial indicators. This also complies with WBCSD's Guidance for Accounting & Reporting GHG emissions in the Chemical Sector Value Chain which Solvay decided to apply.

The financial perimeter includes all fully and proportionately consolidated companies and excludes companies consolidated under the equity method and discontinued operations. Companies are consolidated if they meet one of the three following materiality thresholds:

- Minimal headcount: 150;
- Minimal consolidated balance: 10 M€/yr ;
- Minimal turnover: 20 M€/yr.

#### Perimeter for absolute indicators

- The absolute indicators have been calculated with SolVin, Indupa and Chlor-Chemicals deconsolidated since 2012 and Benvic Europe and Eco Services deconsolidated for the year 2014;
- The consolidation settings for the two HPPO plants (Zv and MTP) have been set at 50% since 2012. Previously they were at 0% for 2012 and 2013;
- For some entities, the consolidation settings (due to new IFRS rules) have been restated since 2012;
- Devnya (Deven): 73.41%, Devnya(Sodi): 73.46%, Freiburg – WVK: 49.9%.

#### Perimeter for key performance progress indicators (relative indicators)

- For those calculations, Eco Services and Benvic Europe were not consolidated for the years 2012-2014. The status for the sites of those BU's was "operational" for 2014. In fact the settings in RT are that they are only sold on January 1, 2015;
- The consolidation settings for the two HPPO plants (Zv and MTP) have been set at 50% since 2012. Previously they were at 0% for 2012 and 2013;
- For some entities, the consolidation settings (due to new IFRS rules) have been restated since 2012;
- Devnya (Deven): 73.41%, Devnya(Sodi): 73.46% and Freiburg – WVK: 49.9%.

# G4-EN21

## NO<sub>x</sub>, SO<sub>x</sub>, and other significant air emissions

In addition to site-specific objectives, the Group is pursuing its overall 2020 targets with a view to reducing the emissions of acidifying gases (sulfur oxides, nitrogen oxides) and volatile organics (with photochemical oxidant formation potential). These KPIs are widely adopted around the world in order to track local consequences both for health and the natural environment.

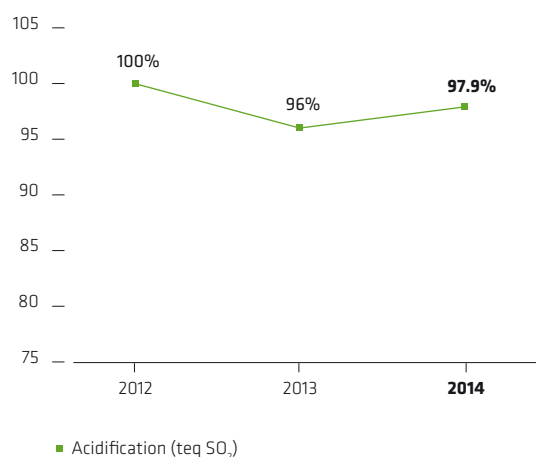
### Solvay's 2020 targets\*:

- To reduce airborne emissions of substances with acidification potential (in SO<sub>2</sub> equivalents) by a further 25% (-3.1% per year).
- To reduce the airborne emissions of substances with Photochemical Oxidant Formation potential (in NMVOC equivalents) by a further 10% (-1.3% per year).

\* Base 2012 at constant activity perimeter

## Performance progress indicators

### → Acidification emissions index (Base 100 – in 2012)



**Perimeter:** Solvay financial perimeter.

**Legend:** Acidification emissions index "at constant activity perimeter" reflects the change in acidification emissions on a comparable basis after correcting the historical perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.

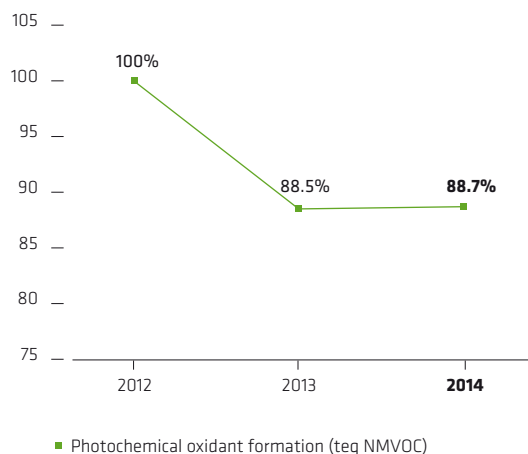
### Acidification

There are several reasons for the slight deterioration in performance for the acidification indicator (+1.9% compared with 2013):

- negative effects from the operational decision not to operate the co-generation unit in Tavaux (France) and the lack in availability of good quality coal for the power plant at Devnya – Deven (Bulgaria) due to the political crisis in Ukraine;
- positive effects from the start-up of the DeNO<sub>x</sub> and DeSO<sub>x</sub> units in Dombasle-sur-Meurthe (France)

The global improvement in performance since 2012 is 2.1%. New projects aimed at reducing emissions from power plants are planned in the coming years, for example in 2015 in Tavaux (France) which will make it possible to meet the target.

### → Photochemical oxidant formation index (Base 100 – in 2012)



**Perimeter:** Solvay financial perimeter.

**Legend:** Photochemical oxidant formation emissions at constant activity perimeter reflects the change in photochemical oxidant formation emissions on a comparable basis after correcting the historical perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.

### Photochemical Oxidant Formation

The performance improvement for the photochemical oxidant formation indicator has remained essentially unchanged since 2013. The global improvement since 2012 remains at the very good level of 11.3%. Projects are planned in 2015-2016 that will resume the improvement of VOC emissions.

## Absolute emissions

### Acidification, Photochemical Oxidant Formation, NO<sub>x</sub>, SO<sub>x</sub>, Non Methanic Volatile Organic Compounds, heavy metals, particulate matter



	2012	2013	2014
Acidification (teq SO <sub>2</sub> )	27,758	26,672	25,066
Photochemical oxidant formation (teq NMVOC)	19,094	18,810	20,348
NO <sub>x</sub> (tons NO <sub>2</sub> )	10,706	10,952	12,628
SO <sub>x</sub> (tons NO <sub>2</sub> )	10,795	10,336	6,598
Non Methanic Volatile Organic Compounds (NMVOC) (tons)	7,933	7,608	7,282
Particulates (tons)	1,447	1,657	1,611

**Perimeter:** Solvay financial perimeter.

**Legend:** The 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 International Panel on Climate Change (IPCC), the World Meteorological Organization (WMO), and elsewhere.

	2012	2013	2014
Heavy metals (tons)	3,4	4,2	2,1

*Perimeter: Solvay financial perimeter.*

### Non-Methane Volatile Organic Compounds

The decrease in the NMVOC indicator (-326 t compared with 2013, or -4.3%) is mainly due to:

- the installation of an acid scrubber (avoiding the release of amines) at the site in Zhangjiagang Feixiang (China);
- the implementation of the ENV2 improvement program at the site in Salindres (France).

A further contributory factor was the shutdown of the Coatis activities at the site in Santo - Andre (Brazil).

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

Compared with 2013, emissions of nitrogen oxides increased by 1,676 t (+15.3%).

This deterioration is mainly due to the acquisition of the co-generation unit from Air-Liquide at the site in Torrelavega (Spain) and secondly to the fact that the co-generation unit in Tavaux (France) was barely operated in 2014 due to low electricity prices. To cover the energy requirements in Tavaux, coal-fire burners were pushed instead, leading to increased NO<sub>x</sub> levels. Higher emissions were also observed at the power plant in Devnya-Deven (Bulgaria), owing to the lack of availability of good quality coal and increased energy production.

Those increases (+2480 t) were partially offset by the installation of the DeNO<sub>x</sub> systems in the boilers at Dombasle-sur-Meurthe (as of April 2014) and improvements at other sites.

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

Compared with 2013, emissions of sulfur oxides decreased by 3738 t (-36.2%).

This is predominantly due to a perimeter change. Indeed, SO<sub>2</sub> emissions from the 7 Eco-Services sites have been excluded from the financial perimeter for 2014.

This decrease was unfortunately offset by the decision at the Tavaux site (France) to increase the production of energy from coal-fired boilers instead of operating the gas-fired co-generation unit (+1836 t).

### Particulates

Compared with 2013, emissions of particulate matter ("dust") improved slightly (-46 t or -2.8%). There were several reasons for this:

The biggest decrease stems from the deconsolidation in 2014 of the Eco-Services business, whose 7 production sites had emitted 79 t in 2013. Another part of the decrease is due to the cessation of soda-ash production at the site in Povia (Portugal) at the end of January 2014.

A real improvement has stemmed from the de-dusting equipment installed at Dombasle-sur-Meurthe (47 t), which has been in continuous operation since April 2014.

Those decreases were partially offset by the inclusion in the reporting perimeter of the new Rasal site (India) and increased dust emissions at the site in Bangpoo (India) due to technical problems in 2014.

### Other air parameters

Many sites have continued to improve other parameters of air quality. Local pollution prevention programs (dust, odors) are in place, with dedicated control programs under way at 56 sites.

In addition, the Group has decided to initiate a more focused voluntary control program concerning emissions of the newly defined Substances of Very High Concern (SVHCs). This will be achieved by selecting priorities on the basis of a harmonized risk matrix common to all risks relating to health and environmental protection.

#### Large investment to improve control of SO<sub>x</sub> emissions in Dombasle (France)

The new desulfurization facility, aimed at treating the fumes from the power generated at this soda-ash plant, has been fully operational since April 2014 after 11 months of construction. The new desulfurization facility will, on average, avoid 1700 tons of SO<sub>2</sub> emissions per year. Treatment relies on a semi-humid process, during which fumes are neutralized by a finely pulverized reagent.

#### NMVOC and SO<sub>x</sub> emission reductions at in Zhang jiagang (China)

In 2014, two innovations were implemented to reduce the emission in the Tertiary Amine production unit: an innovative acid absorption system to increase the absorption capacity of Trimethylamine, and the addition of a control valve on the vent pipe of the Tertiary Amine production unit to limit the waste gas flow-rate. These innovations resulted in a decrease of Trimethylamine emissions by a factor 100. In parallel, a new natural gas boiler was established in Oct 2014 to replace an old coal boiler, with less dust emission and SO<sub>2</sub> emission (-12 tons/3 months), as well as a better control of NO<sub>2</sub> emissions (-4 tons/3 months).

### Substances included in the calculation, standards, methodologies, and assumptions used, source of the emission factors used

- **Acidification indicator:** combines acidifying gases, mainly resulting from the combustion of sulfur-containing combustibles (heavy oils, coal). The sulfur content of natural gas can be neglected. According to ReCiPe v 1.08 - 2013;
- **Photochemical oxidant formation (POF) indicator:** 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 to humans. The POF potential of a substance, expressed as teq NMVOC, is its relative ability to contribute to this effect. Method: ReCiPe v 1.08 - 2013;
- **NMVOC:** Compounds taken into account are those whose normal boiling point is less than or equal to 250°C. This definition is based on the European Solvent Directive 1999/13EC;
- **Nitrogen oxides:** acidifying gases resulting from combustion processes. Thermal NO (generated from the nitrogen contained in the air used for a combustion process) is generally the biggest contributor. Additional NO can be formed from combustibles containing nitrogen compounds, such as coal;
- **Sulfur oxides:** Acidifying gases resulting from the combustion of sulfur-containing combustibles (heavy oils, coal). The sulfur content of natural gas can be neglected;
- **Dust:** particulate materials in gaseous effluent streams.

## 7. Effluents and waste

### G4-DMA on effluents and waste



#### Water effluents

Solvay pursues the continuous improvement of its aqueous effluents, focusing on substances with a significant impact on the aquatic fauna and flora.

Industrial sites deploy programs relating to water effluents:

- emission control and reduction;
- avoidance of environmental infringements and compliance with environmental quality standards;
- impact assessment programs and ecotoxicity assessments; water strategy: reduce water emissions.

In addition to site-specific objectives, the Group is pursuing the overall target of achieving a 20% reduction in eutrophication by 2020 (baseline 2012).

#### Hazardous and non-hazardous industrial waste

The Group is willing to reduce industrial waste and, in particular, hazardous industrial waste, its target being a 10% reduction in landfilled hazardous waste by 2020 (baseline 2012) and optimal material or energy recovery.

For waste streams handled by third parties, Solvay's policy is to contract only with registered and specialized waste-management companies.

Solvay's policy is:

- to focus on the reduction of industrial waste, and especially hazardous industrial waste;
- to limit landfilling of hazardous waste to a minimum, aiming at zero landfill in the long term, 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).

Taking into account technical and economic feasibility, Solvay applies the following waste-management hierarchy in its manufacturing operations:

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

Sites promote internal reuse and recycling via: regeneration of solvents and oils, recycling of catalysts, recovery of organic chlorinated waste, use of ammonium nitrate by-products as fertilizer, recycling of silica and silicate sludge in cement production, etc.

#### Soil contamination

Soil management is vital to Solvay: Like many other industrial companies, Solvay has to manage past soil contaminations stemming from its own or acquired activities. Environmental legacies are managed in order to control risks to underground water.

Assessing soil conditions is a key step in defining and implementing the most appropriate treatments in the event of soil contamination. Where necessary, the sites concerned have been investigated.

Solvay's policy is:

- to prevent soil contamination;
- to characterize soil conditions, where necessary, at the sites concerned (operational or closed);
- to manage the impact of soil/groundwater contamination around Solvay's sites.

For more information, the reader is referred to page 68.

### G4-EN22 Total water discharge by quality and 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 effluents

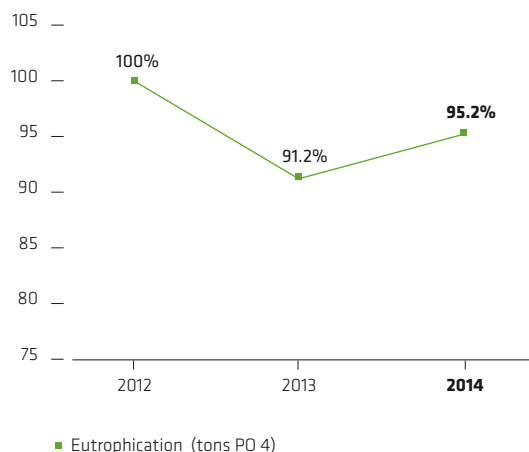
##### Solvay's 2020 target:

**To reduce water emissions by a further 20% (-2.5% per year) for substances with a eutrophication potential (in PO<sub>4</sub> equivalents).**

\* Base 2012 at constant activity perimeter

#### Performance progress indicators

→ **Eutrophication Index**  
(Base 100 - in 2012)



**Perimeter:** Solvay financial perimeter.

**Legend:** Eutrophication Index "at constant activity perimeter" reflects the change of eutrophication on a comparable basis after correcting the historical perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.



The performance at constant perimeter for the eutrophication indicator deteriorated by 4.0% in 2014 compared with 2013 but is still 4.8% better than the performance in the reference year 2012. This increase was mainly due to process upsets in Alexandria (Egypt) and Chalampé (France). In Alexandria, this was due to a mechanical failure on new distillation equipment, which have been repaired. In Chalampé, the upset was due to the temporary dysfunctioning of a column.

### Absolute emissions

	2012	2013	2014
Chemical Oxygen Demand (tons O <sub>2</sub> )	9,400	9,695	<b>9,748</b>
Nitrogen total (tons)	6,184	5,049	<b>5,673</b>
Phosphorus total (tons)	246	243	<b>234</b>
Heavy metals (tons)	81.1	76.7	<b>74.4</b>

*Perimeter: Solvay financial perimeter.*

### Chemical Oxygen Demand (COD)

Compared with 2013, the release of substances contributing to COD (mainly organic substances) remained almost constant despite the important changes in Group perimeter. Globally, a very small increase (+53 t or 0.55%) was observed. This global change is the consequence of rather exceptional events with opposite effects: Reductions in COD releases have been observed due to temporary (Chalampé, France) or definitive shutdowns of productions units (Roussillon in France and Povoá in Portugal). These reductions were unfortunately negated by higher COD releases at other sites, which were either the consequence of increased production volumes (Alexandria, Egypt) or special maintenance operations (Markus Hook and Baltimore in the United States).

### Nitrogen

Compared with 2013, the release of Total Nitrogen (sum of all nitrogen-containing substances, mainly ammonia from soda-ash plants) increased globally by 624 t or 12.4%. This significant overall increase is mainly due to technical problems at the sites in Alexandria (Egypt) and Chalampé (France) but also to increases in production volumes. It is worthwhile mentioning that the site at La Rochelle (France) decreased its Total Nitrogen emissions by 106 t compared with 2013 as a result of the debottlenecking of its ammonium nitrate recovery plant, which reached full potential in 2014.

### Phosphorus

Compared with 2013, the release of Total Phosphorus (sum of all phosphorous-containing substances, mainly insoluble apatite contained as an impurity in the limestone used by soda-ash plants) decreased slightly (-9 t or -3.7%) in the course of 2014.

This global change at Group level is the consequence of changes at individual plants with opposite effects: Decreases in Total Phosphorus releases have been achieved at the sites in Oldbury in United Kingdom and Roussillon (France), both being due to reduced or halted production. The deconsolidation of Eco sites during 2014 contributed a further -5 t. Those decreases were partially offset by increased releases from the soda-ash plants at Torrelavega (Spain) and Rosignano (Italy), linked to variations in limestone quality.

### Heavy metals

The Solvay indicator "Heavy metals to Water" is defined as the aggregate emission load (tons) to water for the eight heavy metals specified in the European E-PRTR list (As, Cd, Cr, Cu, Hg, Ni, Pb and Zn). The European Pollutant Release and Transfer Register (E-PRTR) is the Europe-wide register that provides easy access to key environmental data from industrial facilities. Compared with 2013, the heavy metal releases according to this definition decreased by 2.33 t or -3%. This trend is mainly due to the deconsolidation of the Eco-Services business and the closure of a soda-ash plant (Povoá, Portugal) at the end of January 2014. Variations in limestone quality, the raw material for soda-ash production, also contributed to the observed trend.

#### Largest PVC production facilities in Russia with minimal footprint

This plant, opened in 2014 with an investment exceeding €1.4 billions, fully complies with Russia's strictest environmental regulations. Thanks to cutting-edge vinyl technology, fully automated production and state-of-the-art equipment, the facility's environmental footprint is minimal. Each section of the facility has multi-tier safety systems. An advanced membrane system prevents hazardous substances from being formed during electrolysis. Finally, RusVinyl uses a patented technology that makes electrolysis completely waste-free.

#### Peroxide mega-plant with minimal impact

With a capacity exceeding 300,000 metric tons per year and a planned start-up in 2015, the new hydrogen peroxide mega-plant being built at Sadara's chemical complex in Jubail Industrial City II will be the first hydrogen peroxide facility in Saudi Arabia. The process is particularly efficient: Raw materials are simple. The process avoids the generation of by-products. In addition, it is acknowledged as being more environmentally friendly.

### Substances included in the calculation, standards, methodologies, and assumptions used, source of the emission factors used

Substances included in the calculation, source of the emission factors used:

- **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. Method ReCiPe v1.08 - 2013;
- **Chemical Oxygen Demand** (tons O<sub>2</sub>): Standard definition;
- **Heavy metals**: According to E-PRTR: As, Cd, Cr, Cu, Hg, Ni, Pb and Zn;
- **Total Phosphorus**: Sum of all phosphorous-containing compounds (organics, but also inorganics such as phosphates, etc.) in the effluent, expressed as their phosphorus equivalent;
- **Total Nitrogen**: Sum of all nitrogen-containing compounds, mainly inorganic nitrogen species (ammonium, nitrates, etc.) but potentially also organic nitrogen compounds (amines, etc.) in the effluent, expressed as their nitrogen equivalent.

### G4-EN23

#### Total weight of waste by type and disposal method

#### Waste generation

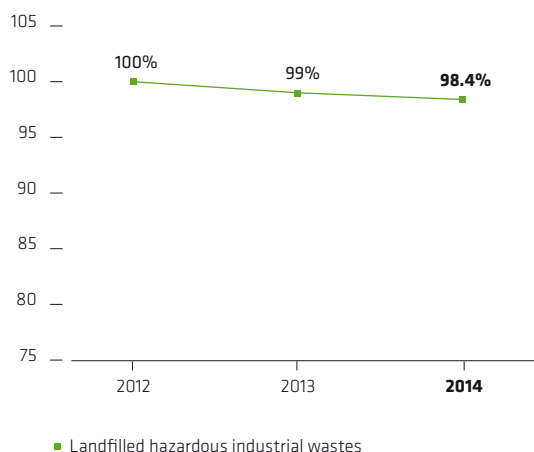
##### Solvay's 2020 target\*:

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

\* Base 2012, at constant activity perimeter.

#### Performance progress indicators

##### → Landfilled hazardous industrial wastes index (Base 100 - in 2012)



Perimeter: Solvay financial perimeter.

Legend: Landfilled hazardous industrial wastes Index "at constant activity perimeter" reflects the change of landfilled hazardous industrial wastes Index on a comparable basis after correcting the historical perimeter to take into account sites movements and introducing corrections for changes in production volumes from year to year.

Compared with 2013, the performance at constant perimeter for the landfilled hazardous industrial waste improved by 0.6% in 2014. Compared with the reference year 2012, a global improvement of 1.6% was recorded. The significant decrease achieved at Chalampé (France) through recovery has been offset by the loss of an external waste recovery route in Tavaux.

#### Absolute volumes



	2012	2013	2014
Total non-hazardous industrial waste (tons)	1,349,654	1,515,296	<b>1,638,790</b>
Total hazardous industrial waste (tons)	197,881	214,712	<b>216,073</b>
Landfilled hazardous industrial waste (tons)	10,215	13,272	<b>12,327</b>

Perimeter: Solvay financial perimeter.

	2012	2013	2014
Mining waste	2,272,532	2,297,555	<b>1,841,997</b>

Perimeter: Solvay financial perimeter.

#### Total non-hazardous industrial waste

The increase in non-hazardous industrial waste in 2014 is mainly due to a trade-off with the energy needed to recycle these materials at Green River (United States). It has been decided not to recycle them because of excessively high energy consumption.

#### Total hazardous industrial waste

Compared with 2013, the amount of hazardous industrial waste produced by the Group increased slightly (+1361 t or +0.63%). Decreases stemmed from the deconsolidation of Eco-Services in 2014 and the closure of Oxadiazon production at Roussillon (France). Increases stemmed from increased production volumes at Chalampé (France), the elimination of waste stored at the site in La Rochelle (France), and the recovery of an oily sludge at the site in Devnya - Sodi (Bulgaria).

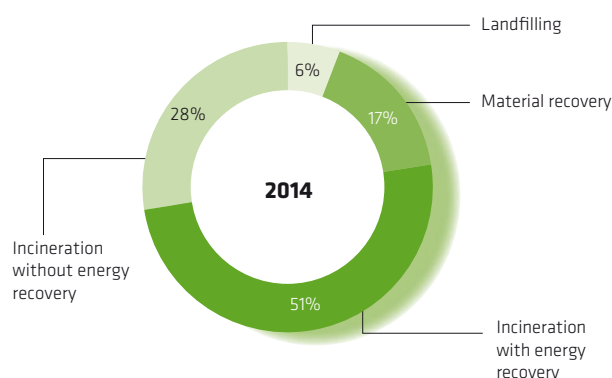
#### Management aspects

##### Hazardous industrial waste

Eighty-five sites have a waste action plan, while 50 are planning to further reduce landfill waste with priority and have targets for hazardous industrial waste.

A large portion (67% in 2014) of hazardous waste is recycled or recovered as an energy source, most often internally by Solvay. Landfilled hazardous waste represents only 6% of total hazardous waste destinations.

##### → Hazardous industrial waste - Breakdown by destination



Perimeter: Solvay financial perimeter.

### Non-hazardous industrial waste

As regards non-hazardous waste, Solvay's high-capacity soda-ash plants generate large quantities of non-hazardous, inert mineral waste (Solvay manufactures almost 5 million t of soda ash in Europe per year.) The composition of this waste, mainly sands and clays, depends on the type of limestone ( $\text{CaCO}_3$ ) used as raw material and also includes some metals. Limestone not transformed in the process is also present in the waste, as well as limited amounts of calcium sulfate ( $\text{CaSO}_4$ ).

These materials do not represent any significant environmental or health risk.

As their volumes cannot be reduced, they are stored in areas close to Solvay's manufacturing sites. These storage areas are subsequently rehabilitated with adapted plant species and may become protected natural reserves due to their biodiversity (Belgium, France, Italy).

For more details on Solvay's biodiversity management, the reader is referred to page 57.

### 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 in ore quality has a significant impact on the quantity of mining waste.

### Organic chlorinated and fluorinated waste

This type of waste is most often thermally destroyed at Solvay installations with very high environmental performance specifications, which generally reprocess 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  $\text{SF}_6$  recovered from customers. Policies exist to promote the development of collection schemes ( $\text{SF}_6$ ).

#### Recovery of Nickel from incineration effluents in Chalampé (France)

In the past decade, this site has succeeded in increasing the recovery of Nickel from its liquid effluents. These effluents result from the washing and quenching of incineration fumes (themselves resulting from the destruction of around 60,000 tons/year of waste containing Nickel catalysts residues). This liquid waste is regularly sent to a third party for further treatment. Thanks to a new way to handle the waste flows by both partners, it is now possible to recover most part of the Nickel present in the liquid effluent, amounting to several hundreds tons nickel recovered per year. In 2014, the full completion of this waste management scheme resulted for the Chalampé site in an additional reduction of landfilled dangerous waste by 2,250 tons.

### Substances included, methodologies, and assumptions used, source of the emission factors used

Waste: Definitions are aligned with EU Directive 2008/98/EC and with the Eurostat Manual on Waste Statistics, 2010.

## G4-EN24

### Total number and volume of significant spills

#### Preventing spills and protecting subsoil

Corrective actions and, more generally, accident prevention are undertaken as an intrinsic part of Solvay's process safety management system.

In addition to site-specific objectives, Group overall 2020 targets (defined in 2012) are being pursued in order to prevent the risks of accidental spills and soil contamination.

#### Solvay's 2020 targets:

- to prevent accidents with environmental consequences, achieving 0 accidents of level High or Catastrophic;
- 100% of our sites have a risk analysis for every production line, that has been updated in the previous five years.

All concerned sites (70) have an ad hoc safety management system in the framework of major risk regulations. Process Safety Management (PSM) introduces key safety elements on sites to prevent major incidents and risks. In parallel, environmental management systems now in place in 98 sites strongly contribute to preventing accidental spills. Both types of systems are key to avoid incidents that may have toxic effects and can ultimately result in negative impacts on the environment. Solvay pays much attention to intrinsic safety when designing installations.

All serious (or potentially serious) process safety incidents learned lessons have been shared across the Group in a dedicated monthly newsletter.

#### Total number of process safety incidents with environmental consequences

Since 2014, Solvay classifies and reports all process safety incidents with environmental consequences according to a scale based on various criteria, including the volume of the spill and the nature of emissions.

#### → Incidents with potential environmental consequences (Medium/High/Catastrophic)

	2014
Medium	53 incidents
High	2 incidents
Catastrophic	0 incidents

*Perimeter: Solvay group manufacturing and Ro-I sites perimeter under operational control. The consolidated data for process safety accidents/incidents cover 81 sites over the total of 130 operational sites.*

#### Main incidents in 2014

Two significant spills (level H) took place in 2014. Environmental consequences were ultimately kept under control.

### ■ Santo Andre (Brazil)

A leak in a pipe of industrial effluent with acidic characteristics reached the river, causing a reduction in pH and leading to fish deaths (400 kg) locally. The location of the leak was soon identified, the effluents were diverted and retained, and the river was quickly returned to normal pH. A voluntary environmental compensation scheme involving the release of fingerlings of the same species is underway. A set of corrective actions have been implemented to prevent a recurrence of this accidental release.

### ■ Epe (Germany)

In Gronau-Epe (Germany) the Salzgewinnungsgesellschaft Westfalen mbH (SGW) extracts salt from mines for use as a raw material. SGW is owned by various companies, among them Solvay. Three of the

resultant underground salt caverns are used to store crude oil as part of Germany's national energy reserves. In 2014 the drill-hole pipe of one cavern released oil into the neighboring clay layer. A crisis team led by the mining authority managed to limit the environmental damage to a minimum.

In the coming year, Solvay's methodologies will be improved in order to better assess the potential environmental consequences of possible accidents. Risk mapping throughout the Group will then be updated, and appropriate additional mitigation measures will be undertaken.

By the end of 2015, the Group plans to define an additional improvement target regarding level M accidents, in addition to the target of zero spills of level H or C.

## 8. Soil management

### On soil



#### Protecting subsoil from contamination

Solvay has continued to manage past soil contaminations from own or acquired activities. Environmental legacies have to be managed in order to protect health and the environment, with a long-term vision and at controlled cost. In 2014 a project was initiated in close collaboration with the authorities to inactivate a subterranean source of mobile chromium by in-situ reduction to an immobile and less toxic form.

Whenever necessary, the contaminated sites concerned have continued to be investigated. Assessing soil conditions and risk is a key step in defining and implementing the most appropriate management measures. In 2014 there has also been a focus on further developing dedicated processes or technologies to remediate soil contamination at the source. Participation has continued in two collaborative R&I projects with universities, research institutes, and other companies: In France, Solvay is leading the Silphes project and providing test areas at the site in Tavaux as a technology pilot for third parties. Solvay is also maintaining its participation in the European Nanorem project, providing another test area for an in-situ pilot test in Zurzach (Switzerland).

A number of sites belonging to the Solvay group (especially in Italy) are currently under investigation by the authorities due to past soil contamination problems.

#### Environmental provisions

Solvay manages environmental provisions and soil contamination with a long term vision.

#### → Environmental provisions



	2012	2013	2014
M€	828	629	713

**Perimeter:** Solvay financial perimeter. The European and Latin American Chlorovinyls activities are, as in 2013, "assets held for sale".

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

Financial provisions have increased by € 84 million in 2014 over 2013. This is mainly due to the development of new and on-going projects, some of which are impacted by changes in regulations. The reduction in environmental provisions in 2013 over 2012 was mainly a consequence of the classification of the European chlorovinyls activities as "assets held for sale" and the evolution of financial items (discount and exchange rates).

#### Rafard, Brazil: a successful case of Environmental Rehabilitation

Production of Furfural took place until the early 1990s at the former plant in Rafard, Brazil, resulting in serious environmental impact on 16 hectares of land. Today, Solvay's Environmental Rehabilitation team is proud of the results of a challenging 20-year adventure. The Furfural production process was based on acid hydrolysis of sugarcane bagasse, the natural breakdown of which produced phenols. Because of the operating conditions at that time, soil and groundwater were impacted. Following detailed environmental studies, it was proven that decontamination of groundwater could be accelerated by biostimulation of natural processes in the groundwater aquifer. Wells designed to inject nutrients were carefully installed. The results are excellent.

According to the analytical results, the land is now environmentally remediated and once final administrative approval has been obtained the sale process can begin.

## 9. Products and services

### G4-DMA on products and services

#### Assessing environmental impacts of products

Standardized Life Cycle Assessments (LCA) supply reliable, unbiased image of products' environmental footprint. Solvay has a strong commitment to establish environmental assessments of all its products based on LCA methodologies. These LCAs feed Solvay's portfolio sustainability strategic analysis within the Sustainable Portfolio Management (SPM) tool.

Solvay supports the environmental impact assessment of its products via a comprehensive understanding of their hazards, risks and environmental impacts. The LCA methodologies in particular are applied according to international standards. Indeed, it relies on internationally recognized methods for assessing the environmental impacts of a product all along its life cycle (Norm ISO 14040, ISO 14044 and ISO 14046). Understanding these impacts is key to improving the environmental performance of Solvay's products, and is extensively used to drive the business orientation to sustainability, via the assessment of the "Operations Vulnerability" of the SPM tool.

For more details about the SPM tool, the reader is referred to page 22.

#### Solvay embarks on world class LCA platforms

To ensure a high level internal expertise, Solvay participates to collaborative platforms aiming at refining LCA methodologies. For example, Solvay is involved in :

- a high level research platform on LCA methodologies coordinated by Ciraig (LCA expertise center based in Polytechnique, Montréal, Canada, supporting the International Chair on LCA) via a 5-years program 2012-2017 with 15 industry partners;
- the ACDV (Association Chimie du Végétal in France);
- the platform SCORE LCA (an association created in March 2012, which aims to promote and organize a collaboration between industrial, institutional and scientific actors to foster a positive development, shared and recognized at European and international levels overall environmental quantification methods, particularly the life cycle assessment (LCA), and their implementation);
- the World Business Council for Sustainable Development (WBSCD) working groups.

For more details, the reader is referred to page 26.

Through those participations, Solvay intends to:

- establish long term collaboration and benefit from world level expertise;
- engage experts on the evolution of life cycle assessment tools and methodologies;

- enrich own sustainability assessment tools (LCA methods, SPM, etc.);
- take better account of social impacts, bio-sourcing, water footprint, etc.

A research thesis is currently being funded and steered by Solvay at the University of Bordeaux, it investigates the field of recycling processes and how they have to be modeled from a - scientifically based - LCA point of view.

#### LCA program progress

The running target is to have cradle-to-gate LCAs (also called ecoprofiles) for:

- all major products of the business portfolio;
- any product with sustainability-critical characteristics;
- any new project related to product or process.

LCA program progress	2011	2012	2013	2014
Percentage of turnover generated with product having an LCA (cradle-to-gate)	55%	67%	77%	88%

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

Those cradle-to-gate LCAs are core for chemical products that are used in many applications, and are a common practice in the chemical industry. Accordingly, extensive cradle-to-gate LCAs are now established for the largest part of Solvay products placed on the market (88%, based on turnover). The program aims at covering Solvay's full product portfolio with a systematic approach, using a unique, standardized methodology in line with international standards.

#### Five axes for Solvay's program on LCAs

Solvay's program on life cycle assessments is aimed at :

1. a comprehensive, benchmarkable, overall mapping of the environmental impacts related to the manufacturing of Solvay's product portfolio, including raw materials;
2. customized LCAs to provide valuable data to Solvay's customers, eventually reviewed by external experts;
3. support to R&D to orientate projects towards sustainable solutions and eco-design;
4. collaborative programs within the LCA world community, to refine LCA process and methodology;
5. the development of metrics for social life cycle assessments, in full consistency with ongoing collaborative programs.

### Assessing the R&I portfolio and other studies

R&I teams now assess 100% of new projects for their environmental impacts. An enriched version of the SPM assessment tool, specifically designed for products and applications still under development, now benefits from the experience gained during several years in innovation project management. Assessing R&I projects helps to “eco-design” the research portfolio, regarding environmental impacts at the manufacturing stages and regarding the alignment of the project with sustainability megatrends in the market.

Considering the environmental impacts of products cradle-to-grave life cycle in an extended CSR approach, some customized extensive studies have been undertaken for and with customers and are submitted to peer-review. As recent examples, Solvay has completed the calculation of the full environmental footprint of automotive parts made from engineered plastics and a full life-cycle study for a garden-hose made from recycled PVC.

The methods used by the Solvay experts for their LCA studies and for the sharing of results are also reviewed by a tier on regular basis in order to ensure the consistency with current standards and norms and current practices in the LCA community.

Solvay is also engaged in the definition and tools for social LCA (S-LCA). The Group is currently working with Ciraig and the WBCSD to clearly set-up the methodologies for S-LCA and its application to specific case studies in the chemical industry.

## 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.

## G4-EN28

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

### End-of-life product recycling

Solvay has been 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, and initiatives.

For recycling Solvay’s own manufacturing waste, see the indicator G4-EN23 page 66. (A large part of hazardous waste is recycled or recovered as an energy source, most often internally by Solvay.)

For more details about renewable raw materials, the reader is referred to the indicator G4-EN1 page 51.

### Policy for end-of-life product recycling

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

### Action for key Solvay products

#### 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, such as soda ash, a significant constituent of glass ( $\pm 20\%$ ), which is recycled indirectly via the very efficient glass recycling schemes.

#### Recycling rare earths from low-energy lamps

Solvay has developed a distinctive technology for recycling the six rare earths contained in the fluorescent powders of used 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 installed at Saint-Fons and La Rochelle (France). Both sites can recycle the six different rare earths – lanthanum, cerium, terbium, yttrium, europium and gadolinium – present in the fluorescent powders, while preserving all their functional properties.

#### Recycling rare earths from batteries and magnets

Solvay has also partnered with Umicore to recycle rare earths from nickel-metal hydride (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, praseodymium, dysprosium and terbium, four rare earths contained in these magnets. Such magnets are largely used in windmills, electric vehicles and hard disks

#### SOLVAir®: recycling residues from acid fumes neutralization by sodium bicarbonate in waste incinerators

The depollution process developed by Solvay in order to neutralize acidic flue gases in waste incinerators is successfully used at many waste incinerators and coal-fired power plants and by other industries in Europe and USA. In addition, Solvay has for the past 15 years been recycling salt residues recovered from the use of the neutralizing reagent sodium bicarbonate. Solvay now has a 100,000 tons/year recovery capacity for these wastes. The purified sodium chloride brine thus recovered is then recycled in soda-ash manufacture, replacing “virgin” salt. The SOLVAir® service, which takes back the salt residues and purifies them, is performed at installations in France (Resolest®) and Italy (Solval®). Both now have a 50,000 tons capacity, with a recent authorization for capacity extension in Italy.

The reactivity of sodium bicarbonate BICAR® is high over a large moisture-content range and temperature range of fumes: The neutralization process avoids water injection for cooling/conditioning purposes and reheating of the flue gas upstream of a catalytic DeNO<sub>x</sub> system (SCR).



The energy efficiency of waste incineration is boosted, offering better energy recovery rates than alternative fume treatment processes.

See: [www.solvairsolutions.com](http://www.solvairsolutions.com)

### Solvents made from recycled feedstocks

To manufacture the solvents Rhodiasolv RPDE and Rhodiasolv IRIS, by-products from the manufacturing of adipic acid and adiponitrile are used as key raw materials. This allows to maximize the use of petrochemical feedstock/recycling waste streams. These solvents, and derivatives manufactured from them, have grown strongly over the last 2-3 years and continue to grow in a number of applications such as industrial cleaning, coatings and agrochemicals where they are replacing solvents such as NMP, acetone, dichloromethane that have come under HSE pressure for health, environment or safety reason.

### Sulfur hexafluoride (SF<sub>6</sub>)

Solvay Fluor offers a worldwide recycling service for SF<sub>6</sub> in Bad Wimpfen (Germany) and in Onsan (South Korea). The United Nations Framework Convention on Climate Change (UNFCCC) has recognized Solvay's SF<sub>6</sub> recycling efforts and registered a particular SF<sub>6</sub> recovery and reclamation Clean Development Mechanism (CDM) project in South Korea. SF<sub>6</sub> is a highly efficient, highly valued insulating gas for medium- and high-voltage equipment. SF<sub>6</sub> serves to simplify the design of switchgears, mainly through size reduction, quiet, and reliable handling and maintenance. As SF<sub>6</sub> has a very high Global Warming Potential (GWP), its emissions must be carefully avoided.

Thus the Solvay SF<sub>6</sub> ReUse Process – available to all users – is one of the main backbones of industry efforts to avoid emissions of this high

GWP gas and convert it to new virgin product exceeding all industry specifications.

Further process improvements have been achieved in 2014, in addition to the enlargement of Solvay's SF<sub>6</sub> ReUse capacities in 2013, in order to handle the increasing volumes of returned used SF<sub>6</sub>.

These innovations basically allow all returned volumes to be re-processed into new, virgin SF<sub>6</sub>, with only a minor portion still needing be incinerated due to unacceptable contamination levels (less than 1% of returned material).

### Recycling of fluorinated/chlorinated hydrocarbons (CFCs, HCFCs, HFCs)

At a high-temperature facility in Frankfurt (Germany), Solvay offers users a recovery service for end-of-use ozone-depleting CFC (chlorofluorocarbon) and HCFC (hydrochlorofluorocarbon) gases, as well as HFCs (hydrofluorocarbons). To prevent releases into the atmosphere, these gases are regulated and emissions should be avoided. To this end, Solvay's unique installation is operated in accordance with the requirements of the European Union Waste Directive in order to produce secondary raw materials (hydrofluoric and hydrochloric acids) that can be recycled in industrial processes. Quantities of CFCs from old refrigerators returned to Solvay's Frankfurt facility have shown a downward trend in recent years. However, the disposal of recovered refrigerants will again supply Solvay's facility with increasing quantities of recovered R22, an HCFC that was brought onto the market in new air-conditioning and refrigeration systems until end of the 1999. In the long term, it is expected that HFCs and their blends from other applications will also increasingly be recovered and recycled, as a legislative proposal is expected to gradually phase down sales of HFCs on the European market.

## 10. Transports

### G4-DMA on transports

## G4-EN30

### Significant environmental impacts of transporting products and other goods and materials for the organization's operations, and transporting members of the workforce



Environmental impacts of transporting products and other goods and materials for Solvay's operations are mainly greenhouse gases resulting from transportation and potential environmental (and health) consequences of accidents possibly occurring during such transportation.

### CO<sub>2</sub> footprint of transport

For the first time we are able to publish the CO<sub>2</sub> footprint on transportation for all the GBUs of the Solvay group. For more details, the reader is referred to the indicator G4-EN17 on page 60.

### Safety in product transport and distribution

Numerous laws regulate transport safety and storage of chemicals. Chemical producers work with scores of international, national and local regulators and with transportation partners to ensure reliable delivery and transportation safety. When faced with transportation risks, chemical companies in general and Solvay in particular rely on sophisticated technologies and decades of safety and security expertise to deliver their products safely by barge, pipeline, rail and truck.

### Management action lines

In 2013 and 2014, a number of preventive actions to avoid accidents were reinforced.

- Selecting logistics service providers: Solvay continued to rely on a variety of schemes to select transporters (see below).
- Developing a global network of Dangerous Goods Safety Advisers in all geographical areas. An internal certification process has been set up based on macro-tasks related to transport safety.
- Progressively reinforcing "Emergency Preparedness and Response" plans in Solvay's plants in order to also encompass off-site emergencies related to transport and distribution, including periodic simulations and emergency-response training sessions.

### Selection of logistics service providers

Selection of transporters is a key to safe logistics.

Road and rail transport of dangerous goods: 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).

In 2014, the process to qualify European road transport companies transporting dangerous goods for Solvay was revised. In order to become or remain a Solvay supplier, carriers must now obtain a satisfactory risk-assessment rating. This rating combines the QHSE evaluation with the number and severity of accidents related to all transport performed by the carrier.

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 all of the bulk sea transporters that carry its products around the world.

For dry products and container shipments, Solvay relies on the Port State Control (PSC) system, avoiding ships that have been detained in the past three years.

Solvay also uses the European Barge Inspection Scheme (EBIS) for inspecting chemical barges operating on inland waterways in Europe.

#### World-wide emergency assistance

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, on the transport documents and on labeling.

Within their areas Solvay sites also offer assistance via national chemical emergency plans, where such plans exist. Such involvement covers the following 12 countries: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Spain, Sweden, Thailand, the United Kingdom and the USA.

#### → Accidents during transport and distribution

	2013	2014
L (Low)	185	124
M (Medium)	22	33
H (High)	0	3
C (Catastrophic)	0	0
<b>TOTAL</b>	<b>207</b>	<b>160</b>

**Legend:** Since 2013, a new method for reporting transportation accidents was defined for the whole new Group, according to a 4 level 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.

In 2014, a total of 160 events during transport and distribution were reported at Group level, with 3 level H (high) accidents, 33 level M (medium) and 124 level L (low) accidents. This represents a reduction in the number of events in absolute figures compared with 2013, but indicates an increase in the level of severity. No level C (catastrophic) accidents were reported.

#### Level H Accidents 2014

- **Shieli marshaling yard, Kazakhstan:** A wagon carrying hydrogen peroxide was damaged while maneuvering the train. One of the IBCs began to leak, resulting in the cargo catching fire. Nobody was injured and there has been no environmental impact. The damaged wagon was subsequently sent for repair and then returned to its owner.
- **MG 259 road, Brazil:** A driver lost control of his vehicle owing to brake failure. The truck overturned. The driver was not injured. The impact caused the tank to open and a large part of its load, namely 23 tons of caustic soda, was spilt on the road. The emergency team transferred the remaining product into another truck. The accident site was rapidly cleaned and the soiled area was treated.
- **Motorway from Blanes site (Spain) to Belle Etoile site (France):** An empty HMD truck turned into a service area. While driving at low speed, the driver was dazzled by the headlights of another vehicle, resulting in a collision with another truck. Police and emergency services were immediately dispatched to the scene. The driver was seriously injured and taken to hospital. The truck cab was badly damaged but the tanker was intact.

#### Best practices in 2014: hydrogen fluoride transportation

A cross GBU/Function workgroup has finalized the "Best Safety Practices Handbook about AHF loading/unloading facilities", which has been submitted to the CEFIC (European Chemical Industry Council).

In North America, hydrogen fluoride management includes:

- **GPS trailer tracking devices** have been installed on all anhydrous HF, aqueous HF, and high-purity grade aqueous HF trailer fleets, making it possible to follow the exact location of the mobile assets in real time with Map View;
- **HF Transportation Safety Committee, United States:**
  - Diverse Team: Logistics, Sales, Manufacturing, Technical Support and Safety;
  - Regular meeting once a month;
  - Analyze incidents for root causes: Identify potential risks/Implement solutions: Track progress of improvement projects;
- **Trailer Unloading Training Video:**
  - Train AHF drivers every 6 months;
  - Train HF customers once a year;
  - Focus on following procedures and improving safety awareness;
- **Training Trailer:**
  - Great tool for valve-capping training;
  - Has been used to train drivers, customers and emergency responders.





# 6.

## Social

<b>1. Labor practices and decent work</b>	<b>76</b>
1.1. Employment	76
1.2. Labor and management relations	79
1.3. Occupational health and safety	79
1.4. Training and education	84
1.5. Diversity and equal opportunity	87
1.6. Equal remuneration for women and men	88
<b>2. Human rights</b>	<b>89</b>
2.1. Freedom of association and collective bargaining	89
<b>3. Society</b>	<b>90</b>
3.1. Local communities	90
3.2. Anti-corruption	95
3.3. Public policy	96
3.4. Anti-competitive behavior	97
3.5. Compliance	97
3.6. Grievance mechanisms for impacts on society	98
<b>4. Product responsibility</b>	<b>98</b>
4.1. Management approach for product stewardship	98
4.2. Sustainable products and solutions	99
4.3. Customer health and safety	100
4.4. Product and service labeling	102

## 1. Labor practices and decent work

### Employment management policies and procedures



Solvay's Code of Conduct sets out its commitment to human and labor rights and specifically to provide safe and healthy working conditions for both the employee and contractors, to provide equal opportunity and encourage diversity, and to maintain a harassment-free work environment.

Solvay's Code of Conduct is supported by various Human Resources that are dedicated to labor issues and, in particular, policies to promote diversity and equal opportunity:

- Career management;
- Job evaluation and job families;
- Compensation and benefits;
- Internal mobility.

Through the IndustriALL Global Union Agreement Solvay reconfirms its commitment to labor rights and to ensuring 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.

Internal awareness-raising on human rights takes place through various channels: Code of Conduct, communication on the IndustriALL Global Union Agreement, and through the People Model, which gives employees the framework to act as a responsible person. The People Model is a social contract between the Group and its employees and promotes relationships based on dialogue, mutual respect and transparency.

The training on labor principles takes place in various ways, through the Group-wide Code of Conduct training but also through more specific management training programs (for example civil treatment for managers). Internal awareness and training on the labor principles is also part of the Solvay Way commitments on "Respecting employees' fundamental human rights and guaranteeing their social rights". The integration of the labor principles is also tracked and measured through Solvay Way self-assessment. Every site is requested to position its practices and to define improvement initiatives.

Solvay has adopted a general policy on reporting irregularities and misconduct. Through the "Speak Up" campaign, Solvay encourages its employees to report their concerns or their ethical dilemmas, initially with their managers or with dedicated internal organizations. Solvay has also installed a Group-wide external reporting line (web and phone based), hosted by a third party, for reporting concerns and seeking advice.

Key and first-line suppliers are subject to regular assessment and audits as part of the "TfS". These assessments and audits include Human Rights and Labor Practices.

For more details on Solvay Way, the reader is referred to page 18.

For more details on the TfS initiative, the reader is referred to the page 31.

addition, Solvay is committed to aligning its workforce with the need to implement sound business strategy. Policies and processes have been developed and launched with a view to attracting staff, ensuring they are retained, and fostering development of the Group's workforce.

The subsequent paragraphs provide the basic data on Solvay's employees, 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 demonstrate the opportunities the Group offers to its employees.

Data show that:

- Geographic distribution of personnel is almost proportional to respective business size: see p. 26-27;
- Voluntary resignation levels continue to be low: see p. 78;
- Internal mobility is a well-established practice within the Group: see p. 77.

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.

### G4-LA1 Total number and rates of new employee hires and employee turnover by age group, gender and region

#### Hirings

In this section we report on both external and internal hiring, showing the number of hirings and internal moves.

→ **Hirings per region**

	2013	% of total employees	2014	% of total employees
Europe	888	3.3%	1011	3.9%
Asia-Pacific & Rest of the World	458	1.7%	634	2.5%
Latin America	314	1.2%	450	1.7%
North America	232	0.9%	222	0.9%
<b>TOTAL HEADCOUNT</b>	<b>1892</b>	<b>7.0%</b>	<b>2317</b>	<b>9.0%</b>

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period. Changes in accounting methods have led to slight differences in figures given for 2013 in last year's report.

The data show the number of external hires per Region in the past two years and express this number as a percentage of the total number of employees.

The Group has considerably increased its hiring efforts in all operating regions. The increase was above average outside Europe. The trend reflects the Group's efforts to employ people close to the business it

### 1.1. Employment

#### G4-DMA on employment

Solvay commits to developing people by offering exciting career paths and challenging opportunities and by building skills for the future. In



is developing throughout the world. Thus the figures demonstrate the Group's ability to attract qualified employees in all regions.

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

#### → Hirings by age and gender

	2014			% of total employees
	Female	Male	Total	
< 30	446	805	1,251	4.8%
30-50	254	653	907	3.5%
>= 50	19	140	159	0.6%
<b>TOTAL HEADCOUNT</b>	<b>719</b>	<b>1,598</b>	<b>2,317</b>	<b>9.0%</b>
% of total employees	2.8%	6.2%	9.0%	

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Rytton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period.

The above table provides a breakdown of hirings by gender and age range. It shows that female hires are largely running at a rate above today's prevalence of women in the workforce in the age ranges up to 50. Lower rates at higher ages are essentially due to candidate profiles being less in line with job requirements.

The age ranges of employees hired suggest that slightly over half are younger than 30. The Group also hires people over 50, albeit to a lesser degree; indeed the over-50 age range is already well represented in the Group, so that needs can often be filled internally.

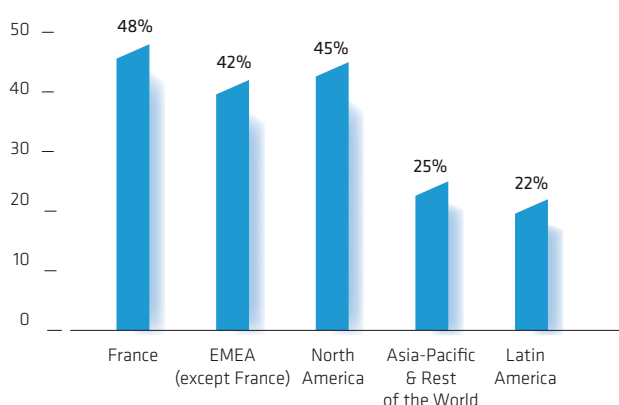
Overall, the figures demonstrate the effort being made by the Group to apply inclusive recruitment practices and to make optimal use of the available labor and talent in different regions.

## 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



**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Rytton.

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 offers 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.

The percentage of internal placements is higher (around 40-50%) in Europe (especially France) and North America and lower in other regions. 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, management as well as non-management.

A substantial proportion of the above-mentioned internal placements were cross-national border in 2014, with some of them being filled by international assignments.

### International mobility

The total number of assignees and their breakdown by home and host Region are given in the following table:

#### → International mobility: Number of assignments in 2014

From Home Region	To Host Region				
	Total Moves	To Europe	To Asia and Oceania	To North America	To South America
<b>TOTAL</b>	<b>496</b>	<b>319</b>	<b>108</b>	<b>56</b>	<b>13</b>
From Europe	387	249	84	47	7
From South America	40	26	1	7	6
From Asia and Oceania	39	24	13	2	0
From North America	30	20	10	0	0

**Perimeter:** Solvay financial perimeter plus discontinued operations.

The figures show a focus on international assignments to and from Asia which corresponds to the attention the Group currently pays 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 can offer. As the cost of assignments is relatively high, the number of expatriations is regularly reviewed and adapted to business needs.

## Global staff turnover

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

## All leaves

### → All leaves by region

	2013	% of total employees	2014	% of total employees
Europe	846	3.10%	917	3.60%
Asia-Pacific & Rest of the World	452	1.70%	561	2.20%
Latin America	395	1.50%	676	2.60%
North America	239	0.90%	188	0.70%
<b>TOTAL HEADCOUNT</b>	<b>1,932</b>	<b>7.10%</b>	<b>2,342</b>	<b>9.10%</b>

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period. Changes in accounting methods have led to slight differences in figures given for 2013 in last year's report.

The overall turnover in 2014 increased compared to the previous year. This is essentially due to restructurings. However, it remains within the normal range of "ups and downs" that are experienced as an organization develops. Voluntary leaves, on the other hand, have remained more or less stable (see below).

Leaves by age and gender do not demonstrate uneven patterns of development. Female departures are over-proportional in the younger age ranges. So far there is no indication that this might be a sign of incompatibility or inequity in the workforce. This question will be analyzed in light of the next Employee survey (results expected by April 2015).

### → All leaves by age and gender

	2014			
	Female	Male	Total	% of total employees
< 30	288	478	766	3.0%
30-50	251	593	844	3.3%
>= 50	124	608	732	2.8%
<b>TOTAL HEADCOUNT</b>	<b>663</b>	<b>1,679</b>	<b>2,342</b>	<b>9.1%</b>
% of total employees	<b>2.6%</b>	<b>6.5%</b>	<b>9.1%</b>	

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period.

## Voluntary leaves

### → Voluntary leaves by region

	2013	2013 of total employees	2014	% of total employees
Europe Total	188	0.7%	160	0.6%
Asia-Pacific & rest of the world Total	257	0.9%	309	1.2%
Latin America Total	131	0.5%	139	0.5%
North America Total	60	0.2%	64	0.2%
<b>TOTAL HEADCOUNT</b>	<b>636</b>	<b>2.3%</b>	<b>672</b>	<b>2.6%</b>

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period. Changes in accounting methods have led to slight differences in figures given for 2013 in last year's report.

Voluntary leaves have remained almost stable in 2014 compared with 2013. As a percentage of Solvay's total workforce, the figure remains low, indicating that the Group's retention efforts are successful.

### → Voluntary leaves by age and gender

	2014			
	Female	Male	Total	% of total employees
< 30	113	177	290	1.1%
30-50	96	207	303	1.2%
>= 50	17	62	79	0.3%
<b>TOTAL HEADCOUNT</b>	<b>226</b>	<b>446</b>	<b>672</b>	<b>2.6%</b>
% of total employees	<b>0.9%</b>	<b>1.7%</b>	<b>2.6%</b>	

**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

**Legend:** Rates are calculated using the total employee numbers at the end of the reporting period.

As with overall turnover, the proportion of voluntary leaves of women is higher than their percentage in the overall workforce. We expect to gain more insight into potential reasons through this year's employee survey (results expected by April 2015).

## G4-LA2

### Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation

Benefits reflect local market practice and law. Legislation in this field differs from country to country. Benefits for part-time employees are generally on a par with those for full-time staff – pro-rated for the hours worked. At some sites, e.g. in the United States, some of the long-term benefits do not apply to part-time employees. For temporary employees within Europe, benefits are granted according to same principles as for full-time employees, whereas outside Europe, standards may be different.

## G4-LA3

### Return to work and retention rates after parental leave, by gender

The Group follows local practice and legislation with regard to parental leaves. The Group's managerial approach is therefore one of decentralization. The question being considered material at local level no Group consolidation or reporting is made.

## 1.2. Labor and management relations



### G4-DMA on labor and management relations

#### Employee engagement and well-being

The Group's employees are a main factor for its on-going success. Keeping employee performance at a high level and even for is a crucial prerequisite for the high degree of productivity that is necessary to sustainably and successfully develop Solvay's activities.

Experience shows that engagement is a main driver for employee performance. Solvay thinks that a key element to foster engagement is the regular dialogue between the managers of the Group and the employees. Such dialogue is essential with each individual and also with employee representatives, where in place, and their organizations.

It is as an integral part of Solvay culture. It is based on the conviction that together everyone can be better prepared for economic, social and organizational changes. Solvay considers maintaining trusting and constructive relations with employees and their representatives to be the basis of such dialogue.

The Group commits to respect employees' fundamental human rights and to guarantee their social rights. These include the freedom of association and of collective bargaining, including the decision whether or not to form trade unions, to organize or not to organize.

Both elements are considered basic requirements for maintaining the necessary acceptance by employees and by society at large in order to deploy its activities. The level of dialogue achieved by the Group is good, even at times innovative. However, Solvay strives to improve even further the level of its social dialogue, as the relationship with its employee representatives is considered to be crucial for its future development and for its acceptance in society at large. This topic and its level of maturity is part of the Solvay Way annual self-assessment.

#### European Works Council (EWC):

A permanent dialogue on sustainability issues has been established for years between Solvay and its European Works Council (EWC). In 2014, the EWC met in plenary session for one week, the sustainable development EWC commission met twice and the EWC Secretariat met 10 times with senior Group management, allowing these representative bodies to be part of the evolution of the Group.

#### Agreement with IndustriALL Global Union

On December 17, 2013, Solvay signed a CSR agreement with IndustriALL Global Union. This international global trade union represents 50 million workers in mining, energy and manufacturing in 140 countries.

This agreement commits Solvay to respect the ILO standards and the principles of the United Nations Global Compact. Each year, two assessments, among one on safety issues, are carried out by IndustriALL representatives on a site to monitor correct application of the commitments at a grassroots level. An annual review was presented to a multi-national body representing the Group's employees (European Works Council). IndustriALL Global Union agreement has been implemented in 2014, and the two first assessments took place, one in Bulgaria for the global safety panel, and the other one in India.

## G4-LA4

### Minimum notice periods regarding operational changes, including whether these are specified in collective agreements

In its policy and practice the Group endeavors to observe a sufficient notice period before implementing organizational changes that may affect employees. These vary according to situation and location. As a general practice, significant operational changes are announced 3 months before implementation starts and individual decisions are made.

Some of the collective bargaining agreements signed specify notice periods for consultation and negotiation. The Global framework agreement concluded between Solvay and IndustriALL Global union includes a provision so that in case of a restructuring employees and unions if any will be informed with anticipation.

## 1.3. Occupational health and safety



### G4-DMA on occupational health and Safety

Staff health and safety has been identified as a "high materiality" sustainability theme for the Group.

Accidents to employees or third-party individuals on Solvay sites may result from failure of safety management relating to risks at the workplace. Personnel accidents at chemical plants may be caused either by explosions, falling objects, falls during work at height or work with mechanical or moving equipment, or by contact with chemicals (hot, corrosive or toxic) leaking from a vessel, pump or pipe. Contractors are especially exposed to risks associated with falls during work at height (during construction and maintenance), use of tools and interaction with equipment, and accidents due to non-compliance with work permit procedures.

Occupational health risks may result from exposure to hazardous agents (chemicals, noise, movements) and chronic exposures to these occupational hazards may potentially lead to disease.

## Policy

High health and safety standards and their constant improvement are an integral part of Solvay's Code of Conduct. They are also part of the CSR agreement with IndustriALL Global Union (see page 25).

Solvay's policy is:

- to move towards zero occupational accidents by promoting best practice and an HSE culture in which all employees share Solvay's commitment to safety;
- to achieve a high level of health and physical and psychological wellbeing among its employees, subcontractors and temporary workers;
- to prevent occupational diseases and disability through a high level of risk management and control;
- to ensure periodical medical monitoring consistent with local law and adapted to individual risk profiles.

## Monitoring health and safety

Health and safety of the personnel working on sites is key to Solvay's industry and people. Solvay's aim to avoid any accident of any kind. The accident frequency rate (accidents with lost time) is the standard indicator within chemical industry. In order to better monitor the severity of injuries (including less severe accidents) Solvay also monitor the MTAR (Medical Treatment Accident Rate), which includes all accidents that lead to medical treatment, including those with lost time. The LTAR (Lost Time Accident Rate) is falling steadily.

When considering the risk of occupational diseases, Solvay uses the widest possible definition for the health of its personnel so as to embrace a high degree of physical, mental, and social well-being. Thus a number of management approaches are in place in order to ensure that employee health promotion is linked to a range of indicators: chemical-exposure risk assessments, medical monitoring, incidence of occupational diseases, stress/wellbeing indicators, and biomonitoring indicators.

The health status of employees and the incidence of occupational diseases are a reflection of their past and present working environment and, in particular, industrial hygiene conditions.

## Management systems for occupational safety

In 2014, 90 manufacturing sites had a standardized Safety Management System (SMS) of OHSAS, VPP\* or equivalent type: RCMS (Responsible Care® Management System, United States). In fact, Group policy requires all industrial sites to have such a system in line with Group standards. In 2014, the Group developed and tested the new "Solvay Care Management System" (SCMS), which aims to encompass all key health, safety and environmental criteria, as well as quality management.

\* Occupational Health & Safety Assessment Series (OHSAS) 18001, Voluntary Protection Programs (VPP) or equivalent, US Responsible Care® RCMS, according to business and local needs.

## Managing risks along product value chains

The management of risks for workers extends along the entire value chain, and especially to the end-user, within a framework of multiple, complementary regulations (see product stewardship, page 98).

The management of substances of concern, in particular, is embodied in Solvay's systems and tools for:

- environmental management (see page 50);
- occupational hygiene (see page 83);
- product safety (see pages 101-102).

# G4-LA6

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

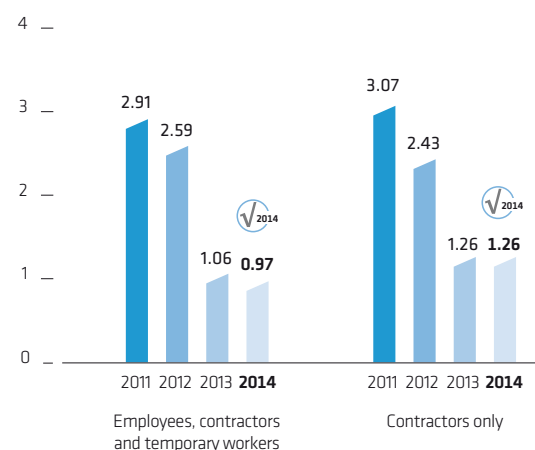
### Occupational safety

#### Solvay's 2020 target:

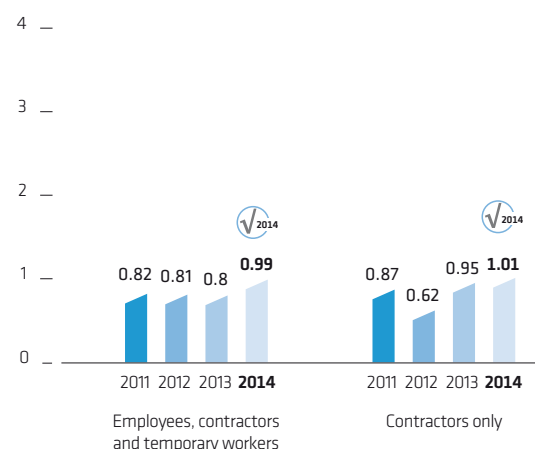
Less than 1 occupational accident with medical treatment (MTAR) per million working hours.

#### → Occupational accidents at Group sites

MTAR – rate of accidents with medical treatment with or without lost time



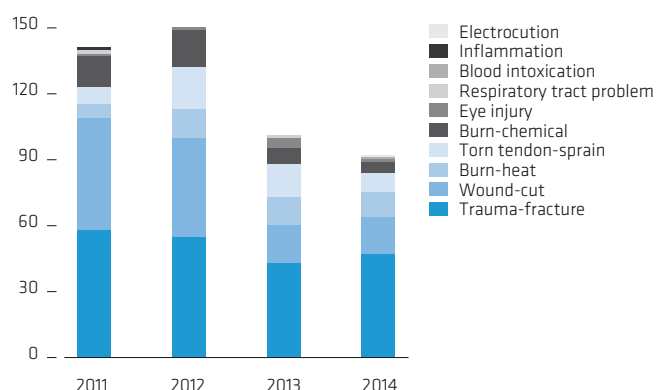
LTAR – rate of accidents with lost time



**Perimeter:** Solvay financial perimeter and all additional sites under Solvay's operational control for which the group manages and monitors safety performance.

**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.

## → Types of injuries



**Perimeter:** Solvay financial perimeter plus additional sites under Solvay's operational control for which the group manages and monitors safety performance – Employees, contractors, temporary workers.

## The challenge to improve further

The Group target has been reached: Solvay's occupational safety performance has been significantly improved in the past 4 years. The MTAR, which takes the severity of injuries into account more objectively than the LTAR, reflects this improvement. The LTAR remained at around 1 in 2014 for the overall population of Solvay's own employees and contractors working on its sites. This LTAR score is better than that of industry as a whole and, in particular, surpasses the track record of the entire chemical industry, which is generally recognized as safe. For example, the European chemical industry has recorded a LTAR of around 4.5 in recent years.

In addition, Solvay has succeeded in better controlling accidents involving contact with chemicals, which have decreased from 26 to 14 accidents per year in the last 2.5 years, and those with irreversible consequences (down from 8 to 2 per year in the same period).



**However, two fatal accidents occurred on our sites (in Egypt and in India) in 2014**, which is not acceptable. A dedicated program is planned for 2015 to prevent them (see below).

## Similar safety performance for contractors

The overall safety performance (LTAR = 0.98 in 2014) and for contractors only (0.99) are now very close. The Group has a long-lasting commitment to provide safe and healthy working conditions on its sites both for its employees and for contractors. Safety programs normally encompass both categories.

## Safety Excellence Plan

A new Group initiative is required in order to avoid any new fatal accident and accelerate the continuous progress curve. Consequently Solvay will deploy a Safety Excellence Plan for the GBUs and sites in the period 2015-16, which consists of three main axes:

- Clear communication of management expectations;
- Development of HSE roadmaps in the GBUs and their respective sites;
- Development of a safety mindset.

This plan requires all GBUs and sites to establish an HSE roadmap that allows prioritization and to follow up on the implementation of good safety practices. This will include: safety days, systematic analysis of near misses, commitment of all management levels to safety, exemplarity and visibility, safety tours, involvement of the entire workforce in all improvement actions, recognition, personal objectives tied to leading indicators, etc.

## Solvay Life-Saving Rules

As part of the 2015-16 Safety Excellence Plan, Solvay designed a "Solvay Life-Saving Rules" program to be deployed at all sites in 2015. Eight rules have been defined which correspond to eight dangerous activities (work at height, on powered systems, traffic, etc.). The Group expects to save lives by asking for strict compliance by everybody and full enforcement. A Group communication campaign was launched in December 2014.

## Addressing human and organizational factors

Solvay's policy regarding human and organizational factors is:

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

### → Deployment of safety programs focused on human and organizational factors (2014)

	number of sites	%
Sites with program	105	88%
Site with programs with safety dialogue	92	77%

**Perimeter:** Solvay financial perimeter plus additional sites under operational control – Total Group personnel

Sites reinforce human and organizational safety factors via a range of programs: "Vigilance", "3 rings of safety", "STOP", "Scout", "Zero tolerance", etc. Most of them involve "safety dialogues". In addition, the newly deployed Safety Initiative reinforces the leadership of the GBU management team through 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 and compliance with safety rules, and creating opportunities for bottom-up exchanges on safety. During the last two years there has been a decrease in accidents with irreversible consequences, which typically occur during cleaning operations and those involving product transfers via flexible hoses.

## System of rules applied in recording and reporting accident statistics

The reporting process concerns occupational accidents and sets out:

- the classification system for accidents involving people;
- the methodology for accident analysis;
- the reporting rules in place within the Group;
- the rules concerning sharing of lessons learned within the Group.

It applies to all sites over which Solvay has operational control. Entities acquired by Solvay must apply this procedure within the quarter following acquisition:

- an accident to a person or persons is an accident that occurs as a result of an undesired and sudden event and which causes reversible or irreversible physical injury;
- an occupational accident is an accident to a person that occurs at the workplace and under the authority of the employer.

The following accidents are excluded:

- illness or death due to non-work related medical causes which occur at the workplace;
- accidents that occur during paid leave, sick leave, maternity leave, interruption due to a lost-time accident or strikes.

An accident is only considered an occupational accident if it occurs while an employee is working. This presupposes that the “person concerned” is under the authority of his/her employer.

An accident that occurs “at a workplace during working hours” is deemed to be a result of work. It is thus considered to be an occupational accident unless it is proven that:

- the cause is not work related;
- the victim intentionally escaped the authority of the employer (fights, tricks, horseplay, etc.).

## Occupational health

### Solvay's 2020 target:

**Health monitoring based on individual exposure profiles and recorded in accordance with Solvay standards for all employees.**

## Health awareness campaigns

In order to increase staff awareness of health issues, 72 sites have carried out specific awareness prevention campaigns addressed to their employees to raise their awareness of health issues in 2014.

## Occupational diseases

### → Occupational diseases identified in 2014

	Asbestos benign pathologies	Hearing disorders	Musculo- skeletal disorders	Other non- carcinogenic diseases	Asbestos cancers	Other carcinogenic diseases	TOTAL
EMEA	5	1	0	2	7	0	15
North America/Mex	0	0	0	0	0	0	0
Latin America	0	0	4	0	0	0	4
Asia South Pacific	0	0	0	0	0	0	0
<b>TOTAL GROUP</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>0</b>	<b>19</b>

*Perimeter: Solvay financial perimeter plus additional sites under operational control – Total Group personnel.*

### Definition

An occupational disease is defined as any disease contracted as a result of exposure to risk factors arising from work activity (International Labor Organization). 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 occupational diseases, the financial consequences of which are not carried by Solvay, are also included in the reporting.

### Occupational diseases profile

The Group continues to improve the prevention of occupational diseases and strives to avoid all dangerous exposures. Most of the remaining diseases reported in 2014 had their origin in occupational exposures that took place in the past. This applies especially to continuing reports of cancers and hearing losses which clearly stem from long-term exposure and, in the case of cancer, several years of latency.

The profile of the diseases reported has remained the same in recent years. They are mainly asbestos-related and, in terms of geographic spread, they are almost exclusively confined to France and to Europe.

## Progress in 2012-2020 roadmap

	2013	2014
Health monitoring: Number of sites with health monitoring based on individual exposure profiles according to Solvay standard	40	40

*Perimeter: Solvay financial perimeter plus additional sites under operational control – Total Group personnel.*

## Health and industrial hygiene monitoring based on Group standards

For health monitoring purposes, Solvay wishes to ensure that medical examinations are based on individual exposure profiles. With this in mind, Solvay has to provide local contracted medical teams with accurate information on risk exposures. This enables local physicians to carry out appropriate medical surveillance. The aim is that all employees requiring medical surveillance will ultimately be monitored on the basis of their individual exposure profiles. As required by Solvay recommendations, this monitoring should be documented in structured systems (Medexis OH2), enabling efficient data management.

Noise and ergonomic factors remain the principal causative factors apart from asbestos, but in some cases chemicals have also been identified as causal in the last 6 years (benzene, PAH from coal pitch, amine and silica).

### Trends in health performance

The overall occupational illness frequency rate (OIFR) per 100,000 hours worked in 2014 stood at 0.03. Globally the number of occupational diseases has been slowly decreasing in the past few years (30 were reported in 2013).

However, occupational cancers due to past exposures to asbestos still led to fatalities in 2014. Seven cases of cancer were also identified, each of which was due to past exposure to asbestos. The number of identified cases of mesothelioma (a type of asbestos-related cancer) has unfortunately remained static over the years due to the long latency period of this disease.

There is, however, a downward trend in benign asbestos-related diseases as well as for other (except mesothelioma) carcinogenic pathology related to asbestos (reported in France). A dedicated program aimed at



removing asbestos materials wherever possible or preventing exposures has, of course, been underway within the Group for many years.

#### Human Biomonitoring programme

A particular focus has been placed on the Human Biomonitoring program in 2014, enabling the assessment of internal (body) exposure by measuring specific biomarkers in body fluids of workers. This approach is promoted as an additional measure by Solvay as well as by CEFIC (the European Council of Chemical Industries), national health authorities and agencies in order to assess the potential risk of health effects. At present, 37 Solvay plants take part in this program and 36 chemicals are involved.

## Absenteeism

As an indicator of wellbeing and stress, the Group is developing an internal reporting system for absenteeism, which will cover 80% of its employees. Further insight will be afforded by the worldwide employee survey which has just been rolled out (Q1 2015). Data are not expected until spring 2015, so they were not yet available at the time of publication of the present report.

#### Health Campaigns

A large number of Solvay sites all over the world organize annual vaccination programs against influenza. There is a significant rise in absenteeism in the working population during outbreaks of influenza and this proves costly to employers. Work loss due to influenza ranges from 0.79 to 4.9 days off work per influenza episode. Those who stay at work work at half their usual productivity. The rate of return between the cost of the vaccination campaign invested and the value of absence time saved is estimated at 2.71.

## G4-LA7

### Workers with a high incidence or high risk of diseases related to their occupation

## Management of occupational hygiene



### Prevention

Solvay is committed to avoiding any high incidence or high risk of diseases among people working on its sites. Health risks related to workers' occupations are assessed and managed via industrial hygiene risk assessments and management at the workstations. The aim is that all Solvay employees should have their occupational exposure profile assessed, controlled and recorded in accordance with Solvay Industrial Hygiene standards.

Assessment or reassessment of all workstations is a 7-year project to be completed by 2020. In 2014 priority was given to 33 sites, belonging to all zones. This was accompanied by a training pack explaining the new hygiene tool (CTES), which is aimed at screening all possible critical exposures at all workstations. These risk assessments result in implementation of the necessary risk control measures at workstation level as part of the continuous improvement of working conditions.

### Solvay's 2020 target:

**All occupational individual exposure profiles assessed, controlled and recorded in accordance with Solvay's new Industrial Hygiene standards for all employees.**

### Hygiene standards reviewed

Solvay's health and hygiene experts are engaged in a 5-year roadmap (started in 2012) aimed at further reinforcing the tools and programs that sustain health promotion, with a focus on workers with higher exposure to health risks. The new SCMS (Solvay Care Management System), which is currently undergoing testing, will impose Group standards for the review of Industrial Hygiene processes at site level, including tracking and controlling risks of occupational exposures.

The new tools, stemming from best approaches developed over the past decade, make Solvay one of the best in class as regards industrial hygiene assessments.

Solvay's occupational hygiene standards and tools have recently been reviewed, requiring further training for hygienists at all of the sites concerned.

#### → Progress in industrial hygiene, 2012-2020 roadmap

	2013	2014
Number of sites trained to new hygiene standards	4	33

*Perimeter: Solvay financial perimeter plus additional sites under operational control – Total Group personnel.*

### Managing exposures to substances of concern

The Group is willing to reinforce *ad hoc* hygiene and medical monitoring and management for jobs and workers whose jobs result in particular risks. For this purpose, a limited number of well-identified "tasks" possibly incurring higher health risks are currently being mapped worldwide.

This dedicated risk management is being developed as part of Solvay's overall management of hazardous substances.

### Solvay Acceptable Exposure Limits (SAELs)

The OELs (Occupational Exposure Limits) and SAELs (Solvay Acceptable Exposure Limits) are 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 any adverse health effects. In cases where OELs defined by authorities are not available or outdated, Solvay has for a long time established its own internal limits, the "Solvay Acceptable Exposure Limits" (SAELs). Such SAELs are also used worldwide in Solvay plants when official OELs differ between countries or regions, to bring consistent protection across countries. 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.

### Industrial hygiene at project start-up

Twenty-five new investment projects have taken advantage of better anticipation of Industrial Hygiene aspects at the early stage of design in 2014.

#### Medexis 2 to globally manage industrial hygiene performance

Medexis 2, the Group's industrial hygiene module, is a tool designed to globally manage data concerning industrial hygiene performance. It was developed in 2014 in partnership with 7 pilot sites in all geographical zones in order to check for compatibility with the needs of users at all sites. Medexis 2 is an integrated tool that will:

- help hygiene experts and all concerned in the day-to-day handling and reporting of industrial hygiene data;
- ensure the deployment of relevant standards for chemicals and thereby safeguard long-term accident prevention and health protection for Solvay group employees.

## G4-LA8

### Health and safety topics covered in formal agreements with trade unions

#### IndustriALL agreement



Several formal agreements have been concluded with trade Unions at different locations of the group, e.g. 12 sites in the United States are covered by Health Care plans based on collective agreements. Two such agreements exist in France. Safety topic is included in the agreement signed with IndustriALL.

In 2013 Solvay signed a Corporate Social Responsibility agreement with IndustriALL Global Union. The specificity of this world agreement, which strengthens the Group's earlier commitments, lies in the desire of both partners to make it operative in a concrete and dynamic way (see page 25).

Every year, IndustriALL representatives meet Solvay employees to check on compliance in the field, with two assessment missions taking place at two different sites. One mission measures the results of the Group's safety policy. The second examines the application of the agreement, which, in particular, formally covers the following health and safety aspects:

- Ensuring good working conditions;
- Managing risk as a daily concern;
- Defining demanding internal policies and their stringent application;
- Improving safety performance and regular monitoring of own and contractors' employees;
- Ensuring healthy working conditions for all personnel, regardless of the job they perform and its associated risks.

## 1.4. Training and education

#### G4-DMA on training and education



Solvay is committed to endorsing the personal and professional 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.

In order to serve this purpose the "Solvay Corporate University" is organized as follows:

- **Leadership & Management** – The Leadership & Management Division contains programs that develop the competences of tomorrow's business leaders and people managers. Programs range from basic management skills to advanced leadership behaviors, including how to influence and impact outcomes;
- **The Academies Division** supports Solvay Professional Families in the achievement of their strategic objectives by working closely in the identification, design and delivery of their required expertise across the world. Academies focus on a learning curriculum which supports the professional development of individuals within the Professional Family as well as content which is more transversal in nature. In the first year of activity, the Division clarified the SCU Academies concept with each Professional Family and identified the first Academies that would be launched. There are plans to launch many additional Academies in 2015 and 2016;
- **Five Zone Learning Teams** supported the deployment of these global initiatives and also the Transversal soft skills and hard skills inside their zones.

Training and education provided by Solvay is integrated with its performance management program. The ultimate objective is to help employees to develop their full potential, performance and employability. Training is a key element in fostering a culture of personal development, which finds a practical tool in the annual Performance and Development Review (PDCR) process.

## 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 per year;**
- **Training of 100% of our employees to Solvay Way and to the CSR agreement signed with IndustriALL.**

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

The Solvay Corporate University (SCU) is a virtual learning entity offering real and practical learning programs available to Solvay employees in all locations. In 2014, Solvay matured its Zone learning framework and actually combined its Asia North and Asia South zones, resulting in 5 learning Zones globally: EMEA, France, Latin America, North America and Asia.

## Academies

Academies are structured in domains by functional area to support the professional families and functions. In 2014, Solvay focused heavily on the deployment of Commercial & Marketing academies, as the Group had a clear intention to reinforce the expertises of these 2 areas in order to support the achievement of the Solvay roadmap. Visioning and development of other academies in other domains such as Human Resources, Research & Innovation, Information Systems, Shared Business Services & Purchasing began in 2014 and will be launched in the course of 2015 and 2016.

Solvay Corporate University created a Facilitation Essentials program to enhance the capabilities of internal trainers within the Group. In line with the strategic intent to shift from reliance on external facilitators to greater reliance on internal facilitators, Facilitation Essentials was built in 2014 and will be launched in 2015.

## Global Leadership & Management programs

In 2014 the following global programs were deployed:

- Adaptive Leadership (Brussels and Singapore): an introduction to self-awareness and collaboration for future leaders. Two sessions were delivered to approx. 80 participants;
- International Management Seminar (Brussels): the Group's talent development program. Two sessions for 80 participants;
- Pilot for the Transformational Leadership Program (Brussels): a senior executive program to develop transformational leadership capability, which was delivered to the Leadership Council with a focus on community-building;
- Management Development Series: an entry-level program for people managers, including experienced and upcoming managers. This program was delivered worldwide in the Zones with 20 sessions and a total of 20,416 hours of training.

## Transversal Zone programs

In 2014 the Zones received a budget to support transversal initiatives in their zones that are more related to front-line management and interpersonal skills. This allowed the zones to deploy training that they considered a priority within subsets of the Group.


## Business & Technical Skills programs

The deployment of sessions relating to hard skills is fully financed by businesses and functions. Consequently there was a decrease in training as the budget was tightly controlled.

## 2014 results

These results include all the training deployment in all 5 zones, including Leadership & Management programs, Academies and local training.

### → Average hours of training per year

	2014
 2014 <b>Per Employee</b>	<b>32.0</b>
By Gender (Male)	<b>31.8</b>
By Gender (Female)	<b>32.8</b>
Per Employee Category (Senior Manager)	<b>22.0</b>
Per Employee Category (Middle Cadre)	<b>32.3</b>
Per Employee Category (Junior Cadre)	<b>36.9</b>
Per Employee Category (Non Cadre)	<b>31.2</b>

**Perimeter:** Solvay financial perimeter plus additional sites under operational control – Total Group personnel.

**Legend:** In SCU calculations we exclude the "apprentices" employee sub-group, and our Headcount base of calculation is the FTE average numbers for the year.

In 2014 we saw a 14.9% decrease in the number of learning hours, from 1,112,134.9 (2013) to 964,191.6 (2014).

Reasons for the decrease include:

- general budget constraints;
- as the budget methodologies of the two legacies were combined, certain GBUs were not able to systematically analyze and precisely request budget. Instead, for 2014, budget was allocated using top-down methodology and accordingly those GBUs operated without a specific calculated budget;
- there were major corporate rollouts that took place in 2013 but not in 2014 (Bridge Workshop, Compensation & PDCR).

In 2013, men (37.3) participated in five more training hours on average than women (31.2). In 2014, there is no significant difference between genders as regards the number of learning hours.

In 2014, there is a higher average for Junior Cadre, followed by Non-Cadre & Middle Cadre, and finally Senior Manager. In 2013, cadre level employees (39.7) recorded slightly more learning hours on average than non-cadre (35.3).

Solvay's continuing focus on Sustainable Development was also reflected in learning activities. During 2014 the Solvay Way initiative, along with other sustainable development topics, accounted for a total of 5,381 hours of training given to 3,063 participants.

**G4-LA10**  
**Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings**



## 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 performance potential 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 were widely incorporated throughout the Group in 2013 via the "Bridge" workshops (delivered to 4000 employees).

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 description, and on expertise, behavioral competencies and strengths demonstrated. Where necessary, areas for further development are highlighted.

Based on such holistic analysis, an individual development plan is prepared. This defines actions to be taken, which may include on-the-job training, learning activities (see above G4-LA09), 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 tool and process have been developed and implemented since 2013: the Performance, Development and Career Review (PDCR). This process covers all entities of the Group. The process is supported by an online tool, integrated with other processes such as Compensation and Learning and Talent Management, ensuring the relevance of the performance results.

Individual contribution is evaluated and feedback is given to the employee by the manager and also by third parties who are invited to provide their point of view on employee performance. In this way a continuous process of performance improvement is implemented.

An important focus of this process is on development and career evolution:

- particular attention is given to assessing the behavioral competencies and expertise of the employee;
- the process envisages that manager and employee will agree on a development plan that will be fixed, reviewed and evaluated at defined moments during the year.

Discussion on employee career evolution is also part of the process. Employee aspirations and management opinion on the possible next career steps are discussed and captured in the tool.

## DSP: Development and succession planning

In 2014 Solvay implemented a new process, the DSP, which is a management meeting where topics related to Succession Planning, Talent Identification and Career Development are discussed and where decisions are prepared and made collectively, taking into account the Group's needs and the cadres' career aspirations and abilities.

The DSP process aims to ensure that the Group has the right people in the right place to achieve its growth strategy and performance by:

- encouraging transversal moves across Businesses/Functions and zones;
- identifying talents more broadly, taking into consideration personal competencies, expertise and aspirations as well as the Group's needs;
- identifying and developing cadres, with a specific focus on the cadres appointed in Key Positions, on the High Potential pool and on owners of critical expertise.

The DSP are organized according to a yearly cycle starting in March:

- "Vertically" at GBU/Function levels;
- "Transversally" at Professional Family level to bring in a cross-Business/Functions perspective and provide recommendations into GBU/Function DSP;
- The final review is realized at GBU/Function levels.

An online tool allows the capture of all the information related to the talents review and the succession planning.

## Transition assistance programs provided to facilitate continued employability and the management of career endings

Specific training programs designed to help manage career endings – whether through termination of employment or retirement – are not consistently deployed in the Group as a global initiative. There are, however, examples of local training initiatives:

- in Belgium, there is a set of pre-retirement workshops that are offered to future retirees. The workshops are on themes such as: change management, financial aspects, time management, legal aspects and health;
- in Portugal, when the decision was taken to close the Povoia de Santa Iria site, a set of workshops were delivered to the employees on themes such as: how to elaborate your CV, how to create a profile in LinkedIn, and how to search for a new job.

## G4-LA11

### Percentage of employees receiving regular performance and career development reviews, by gender and by employee category

In 2014 the PDCR applies to the entire manager workforce.

99.1% of the manager population (about 8,000 people) was covered by the PDCR in 2014.

The process results in performance assessments as well as planned career development actions and proposals. They will be used in the 2014/2015 Compensation Review and other subsequent HR processes such as training, succession planning and career development.

Beyond its initial scope, the PDCR is also used by about 1,400 non-manager employees. Further extension of the system is possible but requires willingness on the part of both local management and personnel.

Local performance and development tools and processes exist for the population not covered by the PDCR online tool. 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.

## 1.5. Diversity and equal opportunity



### G4-DMA on 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 truly diverse 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. Through its approach the Group expects to perform well in its role as employer. It also holds the conviction that its approach will ultimately lead to improved overall performance among its workforce and therefore makes diversity a lever of performance.

The Group's Human Resources policies explicitly require encouragement of diversity so as to strengthen the multinational, multicultural and multidisciplinary composition of the Group's population. They also require observance of equal opportunity in employment 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.

The willingness to strengthen diversity at all levels translates into concrete action. Here are some examples of how diversity issues are addressed:

- Diversity is a top priority point on the HR Management team agenda. (All HR processes are currently reviewed and reassessed with respect to this issue.);
- The Solvay Way program requires that every site addresses and manages diversity and equal opportunity;
- A large number of country-specific commitments were entered into, for example:
  - Convention Mixité in France;
  - A large session on women's leadership has taken place in Asia;
  - A preliminary "generation contract" agreement has been signed in France between Solvay and trade unions. It commits Solvay, between 2013 and 2015, to increase the number of young hires on permanent contracts. With regard to the retention of senior employees, the Company commits to ensure that at least 13% of the workforce is aged 57 years and above.
- The International Management Seminar (IMS) organized for high potentials includes a sequence on Inclusive Management which aims to raise diversity awareness and prepare managers to promote diversity and manage diversely composed teams;
- The development of a Group framework has recently been launched to speed up diversity programs.

### 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.

## G4-LA12

### Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity

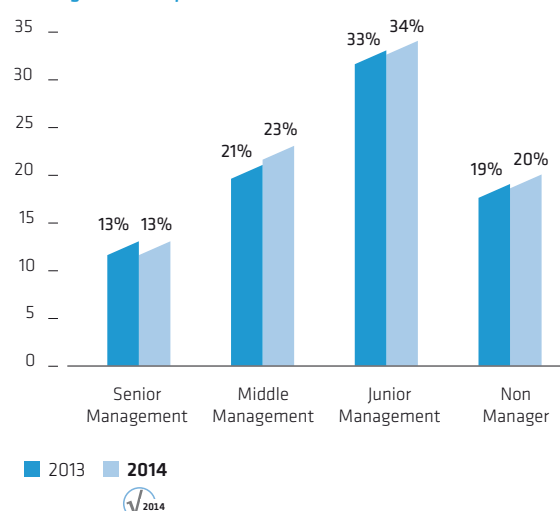
The composition of governance bodies following different indicators is provided in the Group's annual report. The reader is kindly invited to refer to this document.

Below is a breakdown of the Group's employees.

### Gender diversity

#### Gender distribution in Solvay management by level

→ Percentage of women per level



**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.



### Female employees represented 22% of all employees in 2014.

Their presence in the workforce has risen slowly but steadily in recent years.

For more details, the reader is referred to pages 26 to 28 and pages 76 to 78.

At middle management level, the female population rose by 2% points in 2014 to 23% – an 18% increase over 2012. As middle management is the main feeder for staffing the executive management ranks, the development of the middle management population can be expected to translate into a corresponding increase in female representation at the executive level.

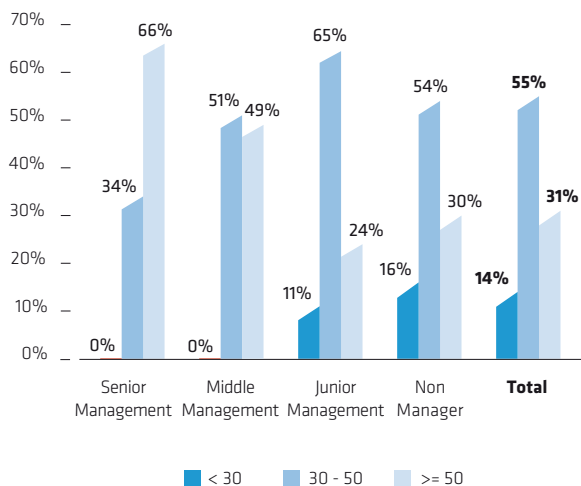
Overall, the representation of women in management positions is already higher than in non-managerial jobs, which are predominantly technical in Solvay's business activities.

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.

As the percentage of female new hires in the young age ranges is much higher than the percentage of women in the present population, it seems likely that their overall presence in Solvay's workforce will continue to increase.

The following table provides a breakdown by employment level and age range:

#### → 2014 Employment by age and by level



**Perimeter:** Solvay Financial perimeter except Chemlogics, ERCA, Flux and Ryton.

## 1.6. Equal remuneration for women and men



### G4-DMA on equal remuneration for women and men

The Group is taking appropriate action 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, which in part determines the reference salary and thus the development of incumbent's remuneration.

## 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 of 80% to 120% of the given grade's reference salary midpoint to ensure salary equality amongst employees within the Company, and also competitiveness and fairness *vis-à-vis* the external work market.

The reference salary is defined per grade (see above). The average ratios and average salaries per grade are similar for men and women in the workforce. As women are still less prevalent at senior levels than men, the overall average of women's salaries is lower than for men.

The remuneration of non-managerial personnel follows local standards and collective bargaining agreements.



## 2. Human rights



**G4-DMA on investment**  
**G4-DMA on non-discrimination**  
**G4-DMA on child labor**  
**G4-DMA on forced or compulsory labor**  
**G4-DMA on security practices**  
**G4-DMA on indigenous rights**  
**G4-DMA on assessment**  
**G4-DMA on human rights grievance mechanisms**

### Commitments, strategies and policies

Solvay is committed to respect and support human rights with regard to its employees, the communities in which it operates and its business partners, as expressed in the internally recognized standards, including the UN Universal Declaration of Human Rights. In addition to the statement in the Solvay Code of Conduct, Solvay's Executive Committee has adopted a specific policy relating to Human Rights. Solvay's commitment is reaffirmed through the social and environmental responsibility agreement with IndustriALL Global Union. Solvay's Code of Conduct and the IndustriALL Global Union Agreement are publicly available and translated into various languages. The policy on Human Right is available on Solvay's intranet.

All Solvay employees are trained on a regularly basis on Human Rights, often as part of a larger training program.

Human Rights are also an integral part of the Solvay Supplier Code of Conduct and play a role in the assessment and audit of its suppliers through the TFS initiative.

See:

[http://www.solvay.com/en/binaries/Code\\_of\\_Conductb\\_2014\\_C\\_EN-147156.pdf](http://www.solvay.com/en/binaries/Code_of_Conductb_2014_C_EN-147156.pdf)

<http://www.solvay.com/en/sustainability/IndustriALL-agreement.html>

<http://www.solvay.com/en/about-solvay/procurement/index.htm>

[www.tfs-initiative.com](http://www.tfs-initiative.com)

### Effective management systems to integrate human rights principles

Respecting employees' fundamental rights and guaranteeing their social rights is one of the Solvay Way Commitments (Commitment 2.2). Each of the sites is responsible for the deployment of this commitment and needs to do an annual self-assessment.

Every year, IndustriALL Global Union carries out two assessments on Solvay production sites chosen by IndustriALL to verify the correct application of the commitments made by the Group. In 2014 the two assessment were made in India and Bulgaria.

Training courses and induction activities are organized to ensure that an ethical and compliant conduct is embodied in the way business is done and also to address behavioral risks in certain specific areas. This includes training on Human Rights.

Responsibility and accountability for human rights is shared between various functions and in particular between the functions of Ethics & Compliance, Human Resources, and Health, Safety & Environment

### Mechanism for monitoring and evaluating human rights integration

Solvay has a strong dialogue with its employees through various channels of communication: the national employer representative bodies, the European Works Councils and the Solvay Employee Survey (Group-wide survey carried out every 2 to 3 years).

Solvay has adopted a general policy on reporting irregularities and misconduct. Through the "Speak Up" campaign, Solvay encourages its employees to report their concerns or their ethical dilemmas, in the first instance with their managers or with dedicated internal organizations. Solvay has also installed a Group-wide external reporting line (web and phone based), hosted by a third party, for reporting concerns and seeking advice. Any concern regarding a breach of human rights is investigated by the Ethics & Compliance function. The Audit Committee of the Board is overseeing the functioning of Speak Up.

## Freedom of association and collective bargaining



### G4-DMA on freedom of association collective bargaining

The Group commits to respect employees' fundamental human rights and to guarantee their social rights. These embrace 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 acceptance that Solvay need from employees and society at large in order to deploy its activities.

Beyond these commitments, the Group strives to maintain trusting and constructive relations with its employees and their representatives. An essential basis for such relations is regular dialogue with employee representatives (when it exists) and their organizations.

Such proactive dialogue is based on the conviction that together everyone can be better 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 in order to develop our activities sustainably and successfully.

### Actions taken and foreseen

The level of dialogue achieved by the Group is good, and at times even innovative. However, we strive to improve the level of our social dialogue even further 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 Works 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 4 times in plenary session 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 Global Union.

This agreement enforces Solvay's commitment to respect the ILO standards and the principles of the UN Global Compact. Each year, two assessments, including one on safety issues, are performed on a site by IndustriALL representatives in order 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 United States and Korea. An annual review was presented to a multi-national body representing the Group's employees (European Works Council).

IndustriALL agreements have been implemented in 2014.

## 3. Society

### 3.1. Local communities



#### G4-DMA on local communities

Local communities are directly affected by the positive and negative impacts of Solvay's operations. Engagement towards local communities is managed at local level by each plant's Management. Local initiatives and communication actions are numerous but not systematically reported at Group level due to the diversity of local actions.

#### Corporate philanthropy and charities

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. More particularly, this is translated into promoting local business, professional training for local young people, and reducing the social consequences of site closures, openings, and restructurings.

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, as well as supporting local associations and initiatives.

The Group's functions, sites and businesses are able to independently choose and fund initiatives that meet the needs of their surrounding communities. Activities range from collectively organizing to help clean litter from Thai beaches to colleagues donating to charities in lieu of using the money for customer holiday gifts.

#### Local initiatives

Since Haiti's earthquake in 2010, the SBS Information Systems team has participated in "PCs for Haiti". Its ambition is to donate 1,000 Solvay computers to Haitian schools and universities, through the French Association GRAHN. The team is working in close collaboration with teams from the Brussels Campus, Dombasle, Paris and Tavaux sites. So far 874 computers have been shipped.

The Solvay Jiangsu site, in China, organizes initiatives to support the children and the elderly. For example, they have donated funds for scholarships to support local students from poor families. For nearby nursing homes, they also donate personal care items and gifts to elderly men and women who have no children to look after them.

The Aroma Performance plant in Salindres, France is part of ALIZE (Actions Locales Interentreprises en Zones d'Emploi). Companies like Solvay are engaged in helping smaller ones develop, donating time and expertise.

Germany's Bernburg site sponsors an annual community race called the Solvay Cup. Elsewhere in the country, the Group's Hannover site provides a mix of donations to children's hospitals and sponsors cultural events, and in Freiburg, teams support activities for refugee kids.

And across the 40 + sites in the United States, a range of activities have taken place. In Alpharetta, Georgia, employees participate in "Habitat for Humanity," helping to construct homes for low-income families. In Houston, Solvay is a major supporter of Junior Achievement, contributing funds and sending an average of about 20 employees per semester to teach six-week business-related courses to school children. In Cranbury and many other sites, Solvay employees strongly support United Way, a national system of volunteers and contributors to local charities. In

addition, Solvay's Chemistry Connection® sends employee volunteers to local schools to demonstrate science through hands-on experiments.

These initiatives, among many others, help build the strong community relationships enjoyed by our sites across the globe.

At corporate level, Solvay policy is to concentrate sponsorship on actions and programs related to:

- Science & Technology
- Education

#### Main corporate initiatives

	2013	2014
Science & technology (Solar Impulse) (in € million)	0.60	<b>0.50</b>
Social & education (XperilAB, International Institutes for Physics and Chemistry)	1.07	<b>1.00</b>
<b>TOTAL (in € million)</b>	<b>1.67</b>	<b>1.50</b>

*Perimeter: Solvay financial perimeter.*

The above figures omit numerous social actions and sponsorship initiatives at local level. No relevant reporting criteria have been established for such multiple actions. In 2014, there was no Solvay Prize, but additional projects were supported.

#### Science & Technology

##### Solar Impulse Project

In 2004, Solvay became the first partner in the Solar Impulse project, which developed 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. The 13 products being used in 25 applications and 6,000 parts improved the energy chain, enhanced the structure, and reduced the weight of the aircraft.

After 77 successful flights achieved by a prototype airplane, Solar Impulse's team and partners have built a second solar airplane, Si2. On March 9th, 2015, the Si2 airplane took off from Abu Dhabi, capital of the United Arab Emirate, to start its tour around the world without using a single fuel drop and return to the same location in late July or early August of 2015.

#### The main science-related projects supported in 2014 are:

- the International Solvay Institutes for Physics and Chemistry;
- UNISTRA, research at the University of Strasbourg on organic luminophores, conducting polymers, piezochromic systems and application of graphenes for conducting systems;
- the Chair for Eco-processes for Sustainable Chemical and biochemical Engineering at the University of Louvain;
- the Chair for Technological innovation at the same university;
- 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 17 university teams throughout Belgium.

### The main projects related to education:

In addition to the “International IUPAC/Solvay Award for Young Chemists”, which will reward five young chemists and researchers from top universities all over the world, and the “Solvay Awards”, which have been recognizing students from two major universities in Belgium for more than 20 years, Solvay is supporting the newly created “Fondation pour l’enseignement”, which aims to develop education in Belgium in order to bring it closer to the reality of the business world.

In 2014, Solvay also started supporting VOCATIO scholarships, which are granted to young talents to enable them to achieve or start their dream.

The XperiLAB project ([www.xperilab.be](http://www.xperilab.be)), Solvay’s exciting “truck – laboratory”, in which an entire school class can carry out real experiments, aroused international enthusiasm when it was a “star guest” at a 4-day congress in Vienna. More than 31 classes participated in the various sessions.

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 year in advance.

## G4-S01

### Percentage of operations with implemented local community engagement, impact assessments, and development programs

#### Engaging with communities

##### → Relationships with local communities

Site self-assessments (including R&I sites): 135 sites	2014
Sites developing regular contacts with significant local stakeholders	60%
Sites with mapping of site stakeholders	82%

In 2014 there was significant involvement by a large number of employees in the yearly self-assessments carried out by all sites under the Solvay Way Sustainability framework.

This encompasses engagements towards local communities, including identification of stakeholders and forms of dialogue, and at many sites it contributes to local economic development through participation in long-term programs (schools, education, improving quality of life). Based on this yearly assessment, sites define action plans to improve their integration with local communities.

##### → An example of engagements towards neighboring communities – Onsan Site (Korea)

Aspects	Actions	Stakeholders	Activities
HSE		Local Companies, community	Monthly meetings with local companies and community to promote safe, healthy, environment-friendly businesses: Exchange of HSE information, networking with local authorities.
	HSE technology exchange Committee	HSE technology exchange Committee	Once a year, we share HSE system know-how, best practices & know-hows concerning contractors’ HSE management, external HSE communication, etc.
	Distribution of brochures for public communication	All related communities and visitors	Around 90 visitors every day: We explain HSE activities & performances, distribute brochures and introduce Solvay group/site outline and GRI Annual Report if appropriate.
	Respond to HSE request	Authorities, NGOs	Around 15 official HSE requests for information (energy/GHG, environment data, safety data, etc.) every day.
	Transfer Site HSE requirements	Contractors & suppliers	Explain & communicate site HSE requirements to the contractors and service providers concerned. (The site won the Ministerial Award for Contractors partnerships in a national competition).
	Participation in local council social meeting	Local councils, administration, authorities, community	Participation in local council social meeting: Onsan site presented “Best response practices in chemical accidents – Emergency Preparedness” at Seoul in 2013 and won the Ministerial award.
Environment	Sponsorship of cooperative projects	Community	Assisting the neighborhood farmers through environment association and offering 3 MW per year in support.
	Environmental opinion leader for Ulsan city	Ulsan Development Institute, local KEMCO, Ulsan University, NGO	Provide advice & suggestions as requested. Participate 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.
Health	Ulsan Health Coordinators’ Committee	Local companies, administration, authorities, community	Share information, especially on existing or pending issues concerning regulations & inspection. Discuss all health topics with technical experts, neighboring companies, administration, authorities and community.
	Training in universities, companies & agencies	Ulsan University, companies	Symbiotic relationship Introduction of Solvay group, products, SCMS & HSEPT programs.

Aspects	Actions	Stakeholders	Activities
Others	Open Day	Local University, Solvay employees' family, Ulsan inhabitants	Educate the population and promote Solvay image with regard to HSE. Inform about Solvay & Solvay Way with gifts.
	Scholarship	Students neighborhood inhabitants	Scholarship for students from university, college and high school.
	Field practices & internship	Local university	Job placement/internship/employment.
	Site Managers' Committee	Companies in Onsan Industrial Complex Foreign investment companies	Share general information (labor, union, HSE, regional council legislation, etc.) for site operation.
	HR/GA Managers' Committee	Local companies, administration, authorities, community	Share general information on human resources (labor laws, union trends, etc.) & general affairs.
	Ulsan City Forum	Ulsan City, Ulju County	Recommendations and suggestions to support Ulsan City, Ulju County.

## Awards and Recognition (last 3 years)

The Group and its operational entities regularly receive awards and recognition for exemplary management practices.

### Group

- **SOLVAY SA:** Award for Best Belgian Sustainability Report in the large organizations category by the Institute of Registered Auditors (2013);
- **GBU SODA ASH:** Pierre Potier Prize for BiForSafe, "Une formulation minérale contre les insectes, à base de bicarbonate de sodium, respectueuse de l'environnement" (2014);
- **GBU FIBRAS:** ICIS Awards for Best Product Innovation for "Emana – a polyamide fiber that emits far-infrared radiation" (2014);
- **GBU RARE EARTH SYSTEMS:** Responsible Care® first prize for Rare Earth Recycling from CEFIC (2013) and the ICIS Award for Best Innovation for Sustainability (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);
  - 3<sup>rd</sup> place in the "Investor in Knowledge" category at the Bulgarian Forum of Business Leaders (2013);
- **GBU AROMA PERFORMANCE:** ICIS Award for Best Product Innovation (2013);
- **ENGINEERED POLYMERS:** Schneider "Planet and Social Responsibility Award" (2014).

### Europe

#### Belgium

- **BRUSSELS SOLVAY CAMPUS:** "Ecodynamisme" two stars label from the IBGE2 for its environmental management (2013);
- **LILLO:** First Responsible Care® Award in Environment Category from CEFIC (European Chemical Industry Association) for water savings in the Harbor of Antwerp (2014).

#### Bulgaria

- **CHERNEVO:** Award for best results in "Extraction of Inert Materials" from the Bulgarian Chamber of Mining and Geology (2013);
- **DEVNYA:**
  - Primus Inter Pares certificate for Innovation (2012) from the Belgium-Bulgaria-Luxembourg Business Club;

- Corporate Social Responsibility Award – 1<sup>st</sup> class Investor in Environment, awarded by the Bulgarian Forum of Business Leaders (2012);
- Bulgarian chamber of commerce and industry award for maximum value of sales revenue in the Northeastern Planning region in 2012 and 2014;
- **CHIPROVTSI:** Bulgarian Investment Agency "Investor of the Year" for HSE achievements in the sphere of chemistry (2014);
- **GORSOW:** Awards for Corporate Social Responsibility (CSR) "Lubuskie Perły Odpowiedzialności Społecznej" for practices benefiting employees, safety and local communities (2013).

### Germany

- **BERNBURG:**
  - Certified as a High-Quality Apprenticing Company by the Halle Chamber of Industry and Commerce (2014);
  - Award for its SCHULEWIRTSCHAFT school-economy engagement network in competition supported by the German Federal Minister of Economics (2013);
- **BAD WIMPFEN:** 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). Also a Special Award from insurer BF RCI for innovative contributions to health protection for designing and constructing a swivel-seat forklift truck (2012);
- **BAD HOENNINGEN:** Solvay Excellence Award for the "Safety category" (2013);
- **RHEINBERG:** "Compressed Air Detectives" honored by the German Chemical Industry Association (VCI) and the Minister of Economy of North-Rhine Westfalia (NRW) (2013);
- **FREIBURG:** German Compliance Prize (2014).

### Italy

- **BOLLATE:** Award from the Italian chemical industry federation Federchimica (2013);
- **FERRARA:** "Innovazione al Quadrato" award for electricity consumption and cost reduction project (2012);
- **TAVAZZANO:** Accreditation under the healthy work project (2014);

## United Kingdom

- **DEER PARK:** For the fifth year, the Gold Award for Safety in Lostock from the Chemical Industries Association (2013);
- **WARRINGTON:** Chemicals Northwest Young Achiever Award for Mark Sullivan (2013);
- **HALIFAX:** Yorkshire Chemical Focus for continuing support (2014);
- **JACAREI:** Award for environmental management from Incheon City on World Environment Day (2014);
- **LOSTOCK:** CIA Gold award for no lost time accidents (2014).

## Portugal

- **SOLVAY PORTUGAL:** Elected President of BCSD4 Portugal for 2013-2016 in recognition of its commitment to sustainable development (2013).

## Spain

- **MARTORELL**
  - "No LTA/MTA Accidents" award from the Organization of the Spanish Chemical Industry for accident-free status in 2012 and 2013 (2014);
  - Award for best human resource management from the AEDIPE (Association of Human Resource Managers) (2014);
- **TORRELAVEGA**
  - "Business partner of the Coorcopar catering service solidarity NGO" (2012);
  - As a business partner of the Blood Donors Association, we extend our thanks every year to Solvay employees who donate blood;
  - As sponsor of municipal sporting and cultural events and host company for educational visits and other services.

## Latin America

### Argentina

- **BAHIA BLANCA:** Special recognition for contribution to the Argentine Chamber of the Chemical and Petrochemical Industry's Environmental Responsible Care® Program (2013).

### Mexico

- **CIUDAD JUAREZ:** One year without a lost time incident. Clean Industry recertification (2014);
- **MONTERREY:** NA RC Award in Health and Safety category (Visual Management program). Monterrey HSE Google site won the Gapps Contest in the Teamwork category (2014).

### Brazil

- **PAULINIA:** Solvay's contribution to water management recognized by Local Basin Agency and Police Agency (2014);
- **CURITIBA:** JV Peróxidos do Brasil recognized by FM Global as the highest site ranked as HPR (Highly Protected Risk) in the Solvay group and 4<sup>th</sup> place among the 434 customers of industrial sector (2014);
- **GBU FIBRAS:**
  - The Amni™ Soul Eco polyamide yarn received the ABIQUIM (Brazilian Chemical Industries Association) Technology Award plus an award in the Sustainability Practices category from AMCHAM (2014);
  - The Emana™ Denim polyamide yarn received an ICIS Innovation Award in London, England (2014);

- **RHODIA:** Recognized by the Brazilian magazine ÉPOCA NEGÓCIOS 360° magazine (5<sup>th</sup> place for Corporate Social Responsibility in the chemical & petrochemical sector) and ranked among the 250 best organizations listed (2014);
- **GBU SILICA:** Recognized by BORRACHA ATUAL magazine at the Top Rubber Awards, Environment category (2013 and 2014).

## North America

### USA

- **AUGUSTA, GEORGIA:** Safety Award Recognition for participating in United Way Campaign Recognition Event, 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);
- **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) – Ohio Bureau of Workers Compensation 100% Awards (no LTAs) and > 1 million hours worked since last LTA;
- **CHARLESTON:** ACC Responsible Care® Facility Safety Award (2012);
- **GREEN RIVER:** State of Wyoming Mine Inspectors' Safest Underground Mine. No Lost Time Injuries in 2013 (2014);
- **GREENVILLE:** United Way, Toys for Tots;
- **LONGVIEW:** Repeatedly received Responsible Care® awards for excellence in Safety and Environmental performance.

## Asia and Rest of the world

### China

- **Solvay China:** Recognized by CPCIF and ICCA as "Best Practice Unit" for HSE deployment under the Solvay Way guidelines (2014);
- **LIYANG:**
  - "Good Faith Demonstration Enterprise of Labor Security" from Jiangsu Province (2013);
  - "Advanced Team of Safety Production" from Changzhou City (2014);
  - "Green Plant" from Changzhou City (2014);
- **QINGDAO:** Three awards from local government:
  - Social Fire Safety "firewall": Advanced unit (2012);
  - Production Safety Responsibility: Advanced unit, (2012);
- **BAOTOU:** Recognized by local government for outstanding safety record (2012, 2013);
- **ZHANJIANG:**
  - Advanced safety culture enterprise, Jiangsu Province (2013);
  - One of ten advanced scientific development enterprises (2014);
  - First level among 45 sites in ZJ New Area in the environment assessment by ZJ New Area Park (2014);

- Awarded “Green Grade” for Environment Protection Credibility by local EPA (of the 37 companies in Zhangjiang, Solvay was the only one to achieve Green level) (2014);
- First-class award for emergency response plan (among 38 companies appraised by Zhenjiang Safety Supervision Bureau) (2014);
- “Advanced group for safety production” by ZJNA Management Committee (2014).
- **ALEXANDRIA:** Certificate of appreciation in recognition of efforts in sustainable development and corporate responsibility (2014).

#### India

- **PANOLI:**
  - Winner in “Design Category” for waste water minimization, International Water Association (2012);
  - Federation of Indian Chambers of Commerce and Industry award for Excellence in Safety;
  - Indian Chemical Council award for HSE Excellence.
- **ROHA:** Commended for Longest Accident-Free Period and Lowest Accident Frequency Rate by National Safety Council. Awarded Certificate of Merit by National Safety Council (Maharashtra Chapter) (2014);
- **SAVLI RD&T Centre:** Federation of Indian Industry and Commerce “Safety in Excellence” award (2012).

#### Russia

- **SERPUKHOV:** Award of the Serpukhov Commercial Chamber for excellent business reputation (2012).

#### South Korea

- **INCHEON:**
  - Environmental conservation award from the Environment Minister (2012), community development award from the city’s mayor (2012);
  - “Environmentally Excellent Company” award from Incheon city mayor (2014);
  - HSE manager commended by city mayor for supporting local environmental conservation (World Environment Day, 2014);
- **ONSAN:**
  - Presidential Citation on “Day of Environment”. Awarded by President of Korea (2012);
  - No. 1 in Korea by Critical Task Analysis. Awarded by Minister of Employment & Labor (2012);
  - Citation on “Day of Occupational Safety & Health”. Awarded by Minister of Employment & Labor (2012);
  - Citation on “Day of Fire-Fighting”, awarded by Minister of Public Administration & Security (2012);
  - Designated as an HSE mentor site, will train other Korean companies. Recognized by MOEL (2013);
  - National Emergency Preparedness competition. MOEL Award of Excellence (2013);
  - Achieved “A” level for “Contractor Partnership Program” (organized by KOSHA since 2012) (2014);
  - KOSHA certificate for achieving the Zero Accident target (7 successive years with zero accidents since 2008) (2014);

- Presidential Citation on “Safety & Health Day”. Awarded by President of Korea (2014);
- Achieved “P” level (the best grade) in the PSM scheme (2014). This is Onsan site’s fourth consecutive “P” level rating since 2003;
- DNV Certificate of Integrated Management System (ISO 9001, ISO 14001, OSHAS18001 & TS16949) (2014).

#### Thailand

- **MAP TA PHUT:**
  - EB: Liyang city Safety award (2013);
  - Industrial Estate Authority of Thailand Governance Award (2013);
  - Leader of Voluntary Energy Saving Agreement program (2013);
  - Ministry of Labor Zero Accident Awards – Silver Level (2013);
  - Ministry of Industry Green Industry Certificate, Level 4;
  - Thailand Energy Award from Ministry of Energy (2012);
- **MAP TA PHUT VINYTHAI:**
  - Liyang city Safety award (2013);
  - Seventh Environment and Safety Governance Award 2014 and “Gold Star – Environment and Safety Governance Award”, Industrial Estate Authority of Thailand (2014);
  - Fourth ZERO ACCIDENT AWARD 2014 – Silver level from the Ministry of Labor;
  - NAGPOO;
  - 3 years without any lost time accidents (2013).

## G4-S02

### Operations with significant actual and potential negative impacts on local communities



Solvay’s neighbors are protected against risks resulting from its operations by means of site environmental management, prevention of accidental spills and prevention of industrial accidents.

Solvay’s continuing policy is:

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

#### Solvay’s 2020 target:

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

*Scope: Group financial perimeter + all other operations under operational perimeter.*



In addition to site-specific objectives, Solvay pursues Group overall 2020 targets, which aim to ensure the integrity of operating systems and processes by applying good design principles alongside best engineering and operating practice. The policy includes the prevention and control of incidents with the potential to release hazardous materials or energy into the environment. Regular risk analysis is undertaken according to a new risk scale, which forms the backbone of our risk control measures.

## Regular risk analysis

### → Risk analysis according to program 2012-2020

	2014
% of concerned product lines having a risk analysis updated in the last five years	65%
% of level-1 risk situations resolved within one year (Solvay red line)	100%

**Perimeter:** Solvay group manufacturing perimeter under operational control. The consolidated data for process safety risk analysis cover 112 sites over the total of 130 operational sites.

All concerned sites (70) have an *ad hoc* safety management systems in the framework of major risk regulations. 75% of our sites require a dedicated PSM system adapted to each site's risks. Solvay currently operates 70 sites with units classified as major risk installations.


Process Safety is an essential and enduring element of Group sustainability, both in terms of protecting people and the environment and in terms of business continuity for all sites concerned. Process Safety ensures 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.

## Resolving "Risk Level 1" Situations

Among the sites which performed risk analysis assessment, the Solvay new program, handling of "risk level 1" situations, is now fully under way. A key element of Solvay's new program now fully under way is the handling of "risk level 1" situations. This requirement has been fully fulfilled in 2014.

Risk scenario has been further characterized using the Group's standardized matrix (Levels 1, 2, 3).

There were 111 "risk level 1" situations at the end of 2012, all solved in 2013. There were 11 "risk level 1" situations at the end of 2013, all solved in 2014.

 **All risk level 1 situations have been handled and resolved within 12 months (full compliance with the Solvay "red line").**

**At the end of 2014, 217 "Risk level 1" situations have been identified and have to be mitigated during 2015.**

157 "Risk Level 1" situations on 217 are relating to one site in China.

Progress to the 2020 target that aims at ensuring that all sites have a risk analysis for every- production line updated in the last five years is at 65 % at end 2014.

### Hydrogen peroxide plant in Curitiba distinguished for business loss prevention

This year the Curitiba site (Brazil) has been distinguished as best in class for business loss prevention and therefore qualifies for drastically reduced insurance costs. The award means that Curitiba implements the best industrial risk mitigation practices worldwide. Only 6% of the world's chemical plants are HPR certified. Within the Solvay group, Curitiba is only the third plant to reach that level, after Deer Park and West Deptford in the United States.

### Process safety at the design phase

Solvay Energy Services is aiming to develop a new business based on the manufacture of torrefied wood pellets (TOP). This activity raises process safety questions that the Group has never faced before. The project team has enlisted two experts from the Process & Transport Safety team to study:

- wood dust explosion risks;
- standards to be applied for risk analysis of the industrial facilities.

Experts from the Process & Transport Safety team firstly studied the wood dust explosion risk and then the standards to be applied for risk analysis of the industrial facility. The projected industrial facility incorporates the experts' seven recommendations.

## 3.2. Anti-corruption



### G4-DMA on anti-corruption

#### Commitments, strategies and policies

Solvay's Code of Conduct expressly states that the Group prohibits bribery in any form. Solvay and its employees do not use gifts or entertainment to gain competitive advantage. Facilitation payments are not permitted by Solvay. Disguising gifts or entertainment as charitable donations is equally a violation of the Code of Conduct. The Code is supported by a more detailed policy on Gifts, Entertainment and Anti-bribery.

Solvay's commitment to zero tolerance of corruption is reconfirmed in the IndustriALL Global Union Agreement. Solvay is a member of Transparency International Belgium.

Solvay has in place a compliance organization under the leadership of the Group General Counsel which sets out to enhance a Group-wide ethics and compliance-based culture and thereby ensure compliance with applicable laws and regulations and compliance with Solvay's Code of Conduct, values and corporate policies.

This organization is also responsible for knowing the law, creating awareness, training employees and developing procedure.

Solvay strongly encourages its joint-venture parties to put in place a similar ethics and compliance program, including anti-corruption. Solvay's Supplier Code of Conduct expressly states that suppliers shall not engage in or tolerate any form of corruption, bribery, extortion or fraud. Suppliers shall not offer any gifts or other benefits to Solvay employees that could improperly influence the Solvay employee.

### Effective management systems to integrate the anti-corruption principle

Both Solvay's Code of Conduct and the policy on Gifts, Entertainment and Anti-Bribery have been approved by Solvay's Executive Committee. The Code of Conduct is strongly supported by Solvay's management. Both the Code and the policy are widely communicated throughout the organization and all employees are required to regularly participate in a training program on the Code or related policies.

Employees need to obtain prior managerial approval before accepting or giving certain gifts or entertainment.

Solvay's Supplier Code of Conduct expressly states that Suppliers shall not engage in or tolerate any form of corruption, bribery, extortion or fraud. Suppliers shall not offer any gifts or other benefits to Solvay employees that could improperly influence Solvay employees.

Auditing on corruption or any other form of fraud is part of the mission of Solvay's Internal Audit function.

For more details on Solvay's Code of Conduct, the reader is referred to the website : [http://www.solvay.com/en/binaries/Code\\_of\\_Conductb\\_2014\\_C\\_EN-147156.pdf](http://www.solvay.com/en/binaries/Code_of_Conductb_2014_C_EN-147156.pdf)

### Monitoring and evaluation mechanisms for the integration of anti-corruption principles

Through its "Speak Up" campaign Solvay encourages employees to inform the Company when they are faced with concerns or ethical dilemmas. Employees are encouraged to discuss these issues in the first instance with their managers. Solvay has also installed an external reporting system known as the Ethics Helpline for reporting concerns and seeking advice. All reports filed will be investigated by the Compliance Organization. In 2014, 32 reports were filed through the "Speak Up" campaign.

## 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.

## 3.3. Public policy



### G4-DMA on public policy

→ Government and Public Affairs Advocacy Staff, Solvay group

FTE

	2012	2013	2014
Corporate	5.5	5	6
Regions	12	11	12.6

*Perimeter: Solvay financial perimeter.*

To act in line with the Group's vision, mission and values in all situations, to foster the best possible business environment for the Solvay group, and to be recognized as a responsible actor in business dialogues with public authorities/stakeholders.

18.6 Solvay employees are directly involved in the management of these matters: 6 at corporate level plus the Government Public Affairs team (corresponding to 12.6 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 compliance with 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 many trade associations such as Business Europe, the European Round

Table of Industrialists (ERT), the American Chemistry Council (ACC), the World Business Council for Sustainable Development (WBCSD) and the European Chemical Industry Council (CEFIC).

In October 2014, Solvay CEO Jean-Pierre Clamadiou was elected President of CEFIC. As CEFIC President, he will advocate framework conditions fostering a sustainable industry in Europe, with a particular focus on Energy Union. He will also work to strengthen the credibility of the European Chemical Industry through an open dialogue with stakeholders. Solvay also engages directly with stakeholder consultations and attends the Parliamentary hearings and debates where relevant.

The success of Solvay's efforts to engage sustainability with stakeholders has been validated by a survey conducted by a third party asking Solvay's stakeholders to rate the transparency and professionalism of the Group in its contacts with them. The Government Affairs function was 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.

In the United States, our employees have established the Solvay Employee Political Action Committee (EMPAC), which is a bipartisan and employee-run organization. Solvay EMPAC accepts voluntary contributions from eligible US employees and independently decides which candidate to support.

Hereunder you will find typical issues in the scope of activities of the Government and Public Affairs Department

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. Solvay supports a global and ambitious legally binding agreement on climate change limiting temperature increase to 2°C and ensuring a global playing field.
Competitiveness of Industry	Contribution to various pieces of legislation developing a sustainable 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.
Anticipating emerging issues	A small group of experts from Public Affairs and HSE called Paracelsus plays a proactive role in monitoring and anticipating emerging issues in health and environment to enable the Company to take responsible actions and positions on complex issues.

## G4-S06

### Total value of political contributions by country and recipient/beneficiary

The Group does not take part in party political activities nor does it make corporate donations to political parties or candidates. However, the Group will engage in a constructive debate with public authorities on subjects of legitimate interest to Solvay. Only those employees specifically authorized to do so will carry out these activities. In this respect, the Group may support non-governmental organizations.

Solvay respects the freedom of its employees to make their own political decisions. Any personal participation or involvement by an employee in the political process must be on an individual basis, in the employee's own time and at the employee's personal expense.

### 3.4. Anti-competitive behavior



#### G4-DMA on anti-competitive behavior

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 competitive advantage.

### 3.5. Compliance

#### G4-DMA on compliance

Management of the legal, ethics and regulatory framework has been identified as a high materiality issue in the complete revision of the materiality analysis performed in 2014. In the past, Solvay has been reporting on the cost of major litigations; work is going on to establish better developed indicators.

## G4-S08

### Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with laws and regulations

#### Antitrust proceedings

In 2006, the European Commission imposed fines against Solvay (including Ausimont SpA, acquired by Solvay in 2002) for alleged breaches of competition rules in the peroxygens market, amounting after appeal to € 139.5 million for Solvay SA and € 12.8 million for Solvay Specialty Polymers Italy SpA. Joint civil lawsuits were filed before the Court of Dortmund (Germany) in 2009 against Solvay and other producers based on the alleged antitrust violation, claiming damages from the producers on a joint and several basis. The value of the claims is approximately € 240 million (excluding interest) against all six defendants. Several questions on the jurisdiction of the Court of Dortmund have been referred to the European Court of Justice and proceedings before the Court of Dortmund are stayed in the meantime.

In Brazil, Solvay is facing administrative claims related to alleged cartel activities in various markets. CADE (the Brazilian antitrust authority) issued fines against Solvay and others in May 2012 related to H2O2 activity (Solvay's share of the fines is € 29.6 million). Solvay has filed a claim contesting these administrative fines before the Brazilian Federal Court.

### 3.6. 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	2014
Cases Reported	18	17	32
Cases Investigated	18	15	29

#### G4-DMA on grievance mechanisms for impact on society

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 Human Resources, Legal Department, Internal Audit or the Compliance Officers. As an alternative, employees may wish to use the Ethics Helpline, which is maintained by a private third party and operated in accordance with local law. To the extent that sufficient information is available, all reports will be investigated. Investigations are 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.

## 4. Product responsibility

### 4.1. Product stewardship



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 a role to play in order for chemicals to be transported, stored, used and disposed of in a manner that is safe both for people and the environment. In this respect, Solvay is actively involved in deploying product stewardship programs and recycling end-of-life products.

“Product Stewardship” programs focus on protecting health and the environment, and ensuring safety across the full product life-cycles of products. “Product safety” covers the recognition, minimization, control and communication of a product’s public and environmental health and safety-related effects along the entire value chain. The mitigation of environmental impacts is addressed by the environmental aspects of such programs. In particular, this includes everything that ensures the adequate handling and disposal of chemical substances by customers and all activities aiming to promote recycling of end-of-life products.

Product Stewardship is a key component of the ICCA’s Responsible Care® Global Charter, which was signed by Solvay in 2007 and re-signed in 2014.

Solvay’s policy is:

- to take actions and carry out product stewardship programs that contribute to the safe management of hazardous products throughout their life-cycles during use and disposal, with particular attention to products involving higher risks.

### Pioneering role in the management of substances of concern

In addition to the management of all dangerous substances (risk analysis, labeling and product stewardship), Solvay is now pioneering the adoption of a global approach to dangerous substances of concern, beyond the EU definition, based on international legislation and the internal expertise of toxicologists and ecotoxicologists.

A dedicated multidisciplinary team is working on the inventory of products within the portfolio that contain “Substances of Very High Concern”. The Solvay SVHC list includes all substances that are:

- Carcinogenic, Mutagenic or Toxic to Reproduction (CMR), meeting the criteria for classification in accordance with the new European Regulation adopting the UN’s Globally Harmonized System (GHS);
- Persistent, Toxic and Bioaccumulative (PBT) or very Persistent and very Bioaccumulative (vPvB);
- Identified, on a case-by-case basis, through scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern to those of the substances referred to above.

Solvay’s policy regarding such substances is:

- to identify any Substances of Very High Concern that are used or produced
- to handle Substances of Very High Concern under strictly-controlled or equivalent conditions;

- to update risk studies;
- to strive to substitute such substances when safer alternatives that are technologically equivalent and socioeconomically sustainable are available.

#### Solvay’s 2020 target:

**To complete 100% of risk assessments and analysis of safer alternatives for marketed products containing SVHC.**

### Management of Product Stewardship – addressing all risks related to product

To prevent impacts on people and the environment from its products, Solvay deploys product stewardship along 9 action lines. Dedicated action is taken with regard to: Substances of Very High Concern; substances destined for the health, feed and food markets; and a number of chemicals with hazardous properties, such as peroxides, which deserve special attention in terms of fire and explosion hazards.

#### → Product Stewardship deployed along 9 axes

<b>Product knowledge &amp; compliance</b>	1. Comprehensive understanding of hazards, risks and impacts over the entire product life-cycle.	Supplying Product Safety Information – pages 103-104
	2. Environmental life cycle assessments.	Ecoprofiles of products – page 69
<b>Manufacturing operations</b>	3. Preventing risk at the workplace.	Industrial hygiene standards – page 83
	4. Complying with product technical specifications.	as part of quality management
<b>Product information</b>	5. Ensuring Safety Data Sheets are sent to customers and revised at least every 3 years.	Supplying product safety information – pages 103-104
<b>Distribution and use</b>	6. Dedicated product stewardship programs addressing specific products, markets and customers.	This section
	7. Avoiding accidents and spills during distribution.	Transport safety – see page 71
<b>Substances of high Concern</b>	8. Ensuring dedicated management of such substances.	Environmental management – page 50 Product safety – page 101 Occupational hygiene – page 83 Risk assessment and substitution – page 100
<b>Recycling</b>	9. Recycling of end-of-life products.	End-of-life product recycling – page 70

### The most dangerous acid in the world: preventing HF burns

Hydrogen Fluoride or Hydrofluoric Acid is a precursor to almost all fluorine compounds: pharmaceuticals, refrigerants, herbicides, high-octane gasoline, aluminum, plastics, electrical components, diverse materials such as Algoflon®, fluorescent light bulbs... It is also one of the most dangerous acids: When in contact with humans, it poses a double risk: It attacks the skin surface, resulting in chemical burns, and it also permeates the skin, reacting negatively with the blood. In 2012, a Hube Global Ltd. chemical plant in Korea experienced a huge hydrofluoric acid leak resulting in the death of five workers, with 18 seriously affected, 1,500 people evacuated and 900 admitted to hospital. It also caused loss of property valued at € 6.4 million.

As a producer of HF, Solvay has long-term experience in handling this chemical safely. Solvay recently published a very practical new set of dedicated safety standards for internal staff that handle this substance. It is also in the process of producing guidelines to be published in 2015 for customers who use it.

The "Best Safety Practices Handbook about AHF loading/unloading facilities" has been submitted to CEFIC (the European Chemical Industry Council).

## 4.2. Sustainable products and solutions



Solvay continues to deploy its presence in markets where its products serve more sustainable solutions. These solutions should not only be "obvious" ones, such as biodegradable products for soaps and shampoos or renewable-based solvents for paints and coatings, but also 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.

See Sustainable Portfolio Management page 22.

### Sustainable energy

#### Organic Light-Emitting Diodes (OLEDs)

Solvay has acquired Plextronics in 2014 and integrated its technology into Solvay OLED, an incubator to create new business for Solvay group. Solvay OLED has been working with customers and partners to advance the printed OLED technology. Compared with the existing process, the printed OLED is expected to reduce waste and increase manufacturing efficiency.

#### Additives and binders for batteries

Electric energy storage is a key bottleneck in the production of energy from sun and wind. Increasing storage capacity helps renewable energy to be used in a competitive way. PVDF increasingly tends to be used in Li-ion battery materials (from cathode binders to separators, etc.). High molecular weight Solef® PVDF grade helps to increase power density in lithium batteries (e.g. for electrical cars). By increasing the capacity of the batteries, it helps to reduce the total weight. By increasing the capacity of the batteries, it also helps to limit the discharging rate, therefore increasing their lifetime.

Solef® PVDF (Polyvinylidene fluoride) is used in Alternative Energy as an electrode binder. It guarantees durable adhesion at electrodes and mechanical integrity in the aggressive chemical environment of the battery.

Solef® PVDF is a fluorinated, semi-crystalline thermoplastic. Without any additives, it provides a combination of properties resulting in longer equipment life.

### Sustainable chemical solutions for the fast-growing Oil and Gas (O&G) market

The Oil & Gas industry offers challenging applications for most polymeric materials, demanding high-temperature performance, chemical resistance, chemical permeation resistance, toughness and flexibility even at low temperature, excellent electrical insulation and long-term reliability. Solvay provides a wide range of high-performance polymers that meet Oil & Gas critical requirements. Solvay's range of solutions for oil & gas drilling and production include a wide array of products such as gelling agents, friction reducers, emulsion breakers, biocides and scavengers, corrosion inhibitors, and acidizers, all key components of completion or production fluids.

### Climate care

Solvay now has a very strong expertise in the development of greenhouse gas emission reduction projects using the mechanisms defined by the Kyoto Protocol, and in the monetization of emission reductions in the main carbon markets worldwide. The Group produces electricity from biomass in Brazil and torrefied biomass in USA (which can substitute coal in power plants). Solvay offers a customized and integrated approach to reducing energy costs and CO<sub>2</sub> footprint.

### Renewable materials

#### High-performance modified wood

Solvay Acetow and Accsys Technologies PLC confirmed 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

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 of 50% at present and has a much lower CO manufacturing footprint compared with conventional plastics. Ocalio™ can be easily molded and is designed for a wide range of consumer goods end-uses such as containers for cosmetics and personal care, electronic devices, toys and mobile phones.

### Cleaner environment (Advanced formulations, Advanced materials)

#### Mixed-Oxide Optalys for Gasoline Depollution (CO+HC+NO<sub>x</sub>)

Vehicles are major contributors to air pollution. Air pollution refers to the presence of foreign substances in the air that do not belong there, or excessive amounts of certain impurities that would otherwise not harm us. When cars burn gasoline, they emit pollutants. The majority of combustion gases, such as nitrogen (N<sub>2</sub>), water vapor (H<sub>2</sub>O), and



carbon dioxide (CO<sub>2</sub>), are not toxic or noxious, although carbon dioxide is generally recognized as a greenhouse gas that contributes to global warming.

Three-way catalytic (TWC) converters convert toxic pollutants in exhaust gas to less toxic pollutants by catalyzing a redox reaction (oxidation or reduction). These converters combine carbon monoxide (CO) with unburned hydrocarbons (HC) to produce carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) and reduce oxides of nitrogen (NO<sub>x</sub>). The washcoat is the carrier for the catalytic materials and is used to disperse them over a large surface area. Aluminum oxide, titanium dioxide, silicon dioxide, mixed oxide of zirconium/cerium or a mixture of silica and alumina can be used.

Mixed oxides contribute to the sustainability of the TWC converters by stabilizing precious metals up to 1,100°C.

### Water filtration membrane

Filtration membranes increase the local availability of fresh water, since these membranes can be applied in different types of compact solutions. Water Purification by Membrane Filtration is a fast-growing global market: Udel® polysulfone (PSU) consists of a repeating structural unit composed of phenylene units linked by three different chemical groups: isopropylidene, ether, and sulfone. Udel® polysulfone (PSU) is a rigid, high-strength, semi-tough, transparent plastic that offers higher heat resistance and better hydrolytic stability than polycarbonate (PC). It retains its good mechanical properties when exposed to steam and other sterilization techniques.

It is used in Water Treatment (WT) for water filtration membranes used in fresh water production.

### 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 less environmentally-damaging solvents in rubber synthesis.

### 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 CO<sub>2</sub> emissions. The project, in partnership with SOGEFI, has received the support of the European Commission's LIFE+2012 (LIFE12ENV/FR/000480) program for the next three years.

## Other developments in sustainable innovation

### Innovation Portfolio expanded into two new market segments: fertilizer protection and seed boosting

Solvay Novecare's innovation portfolio 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.

## Safer materials

In food production, Solvay's range of peroxygen products make food safer to eat and more accessible. In farming, we contribute to a healthy living environment for animals and fish, controlling disease or eliminating it at source, with low toxicity and low environmentally persistent products.

## Sustainable Innovation in 2014

See Sustainable Innovation page 42:

- Novel Halar® ECTFE film grades are new options for the solar industry;
- Seed boosting: germination increased from 10% to 15%;
- Fertilizer protection: optimizing the use of fertilizers while reducing the environmental footprint of agriculture;
- Introduction of the Eco-Friendly Tixosil® MicroPearl Silica for personal care applications. Ocalio: an innovative bio-plastic based on cellulose acetate;
- Promising new candidates for more easily biodegradable agro-active ingredients;
- Solvay smart biodegradable fibers Amni® and Emana® win international innovation awards.

## 4.3. Customer health and safety



### G4-DMA on customer health and safety

## Risk management approach for customer health and safety

The management of product risks extends along entire value chains, in particular customers and end-users, in the framework of multiple complementary regulations and processes.

Solvay's overall management of hazardous substances translates into management systems and tools for:

- environmental management (page 50);
- occupational health and safety (page 79);
- occupational hygiene (page 83);
- product stewardship (page 98).

New dedicated processes specific to SVHC (Substances of Very High Concern) are now in place that define how such substances must be handled in Solvay's own industrial operations and when placed on the market.

## Regulation on customer health and safety

From a regulatory standpoint, 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 European requirements (*i.e.* the Classification, Labelling and Packaging European framework). In addition, many Safety Data Sheets have 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.

### Managing all products: Global Harmonized System and full REACH compliance

Solvay currently manages over 4,500 chemical substances that are placed on the market as such or in mixtures. Solvay is committed to a comprehensive understanding of each product's hazards, risks and impacts from production step until end-use. To continue assessing products and providing all necessary safety information to downstream users, Solvay fully complies with Europe's REACH registration agenda (464 substances registered so far).

### Emerging legislation and GHS

We also pursue the necessary adaptation to cope with emerging new (REACH-like) regulations in other countries and with the Global Harmonized System, a major initiative by the United Nations to harmonize the classification and labeling of chemicals worldwide. Solvay deploys the requirements of GHS by implementing the “blocks” of requirements defined by each country. 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.

### The EU CLP Regulation

In the EU, the Global Harmonized System is embodied in the Regulation on the “Classification, Labeling, and Packaging of substances and mixtures” (CLP). This applies to all Solvay's substances and mixtures placed on the market or handled by our personnel. For “individual substances”, the notification deadline was already met in 2010: All Safety Data Sheets for CLP-concerned substances were distributed in time, with the appropriate CLP classification. The next deadline for Europe (for mixtures) is May 2015. GHS is also being progressively transposed into regulations in other countries (Brazil for mixtures, USA for individual substances and mixtures). Worldwide, Solvay will have to reassess and classify 1,295 substances before the deadline of May 2015.

With the support of a dedicated team of toxicologists and ecotoxicologists, Solvay is committed to innovative and sustainable ways of characterizing products and their risks. Solvay's experts are also involved in scientific groups that are developing methods and designing future regulations (e.g. update of REACH).

### Pioneering role in the management of substances of concern

In addition to the management systems for all hazardous substances (risk analysis, labeling and product stewardship), Solvay is now pioneering the adoption of a global approach for hazardous substances of concern, beyond the EU definition, based on international legislation and the internal expertise of toxicologists and eco-toxicologists.

A dedicated multidisciplinary team is currently working on the inventory of products containing “Substances of Very High Concern” within the Solvay portfolio. The Solvay SVHC list includes all substances that are:

Carcinogenic, Mutagenic, or Toxic to Reproduction (CMR), meeting the criteria for classification in accordance with the new European Regulation adopting the UN's Global Harmonized System, the so-called “GHS” Regulation;

Persistent, Toxic and Bio-accumulative (PBT) or very Persistent and very Bio-accumulative (vPvB)

Identified, on a case-by-case basis, through scientific evidence of probable serious effects to human health or the environment which give rise to an equivalent level of concern to those of the substances referred to above.

#### Solvay's 2020 target:

**To complete 100% of risk assessments and analysis of safer alternatives for marketed products containing SVHC.**

Solvay's policy regarding such substances:

- To identify Substances of Very High Concern used or produced;
- To handle Substances of Very High Concern under strictly controlled or equivalent conditions;
- To update risk studies, and strive to substitute them when safer alternatives that are technologically equivalent and socioeconomically sustainable are available.


## G4-PR1

**Percentage of significant product and service categories for which health and safety impacts are assessed for improvement**

### Management of substances potentially of concern

New dedicated rules specific to substances of concern are now in place that define how such substances must be assessed and handled in Solvay's own industrial operations and when placed on the market. This translates into standardized risk assessments and management according to the Group Management Book. These are becoming key management levers not only in product stewardship but also in the management of Occupational Health & Industrial Hygiene and of Environmental Management.

## Solvay's Substances of Very High Concern (SVHC) placed on the market

	2014		
	Number of substances <sup>(1)</sup>		Management
	SVHC present in products put on the market	... for which this presence is due to raw materials	
SVHC (list according to REACH regulation - EU Authorisation process)	8	6	(For Substances put on the market in Europe): Updating risk studies, assessing substitution alternatives (For other regions) Extending risk studies
SVHC (list according to REACH regulation - EU Candidate list) <sup>(2)</sup>	17	12	(For substances put on the market in Europe) Preparing to update risk studies and assessing substitution alternatives (For other regions): Extending risk studies
All SVHC substances (according to REACH criteria)	25	18	
(Program 2018): % of SVHC reviewed for potential substitution (world) <sup>(3)</sup>	0%		

**Perimeter:** All Solvay products – except notably BENVIC (now outside Solvay) and Chemlogics – put on the market, manufactured by Solvay or part of the composition of sold products.

**Legend:**

- (1) SVHC substances manufactured or part of the composition of products sold by Solvay worldwide\* currently in Europe's "Candidate list" or "Authorisation list" of the REACH process.  
 (2) Candidate list includes substances also present in restriction process (annex XVII).  
 (3) % of products containing SVHC reviewed for potential substitution via Solvay internal dossiers (100% = all SVHC (or products containing SVHC) placed on the market by Solvay) – program with 2018 deadline.

In order to anticipate possible future banning or substitution requirements, three categories (black, red, yellow) have been established that define the level of risk management to be carried out:

- **Black list:** SVHCs already in a regulatory process of phasing-out or restriction with a known deadline in at least one given country or zone;
- **Red list:** SVHCs currently included in a regulatory list of SVHCs which can be introduced into a process of authorization or restriction in the medium term;
- **Yellow list:** SRA = Substances requiring specific attention under scrutiny by authorities, NGOs, scientists and industries due to current hazard properties or potential effects.

#### Strict control and substitution assessment

A program (2013-2018) has been initiated to assess or reassess all substances from the SVHC list according to a revised Group-wide procedure, considering both the ways to strictly control risks and the technical and economic feasibility of substitutions. All of the substances concerned that are placed on the market by Solvay must be assessed by the end of 2018.

## 4.4. 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

#### G4-DMA on product and service labeling

#### Product information

Solvay manages product information centrally. In the framework of evolving legislations, particular effort has in the past years been invested in improving the knowledge of the conditions under which products are used, so as to record and assess any associated risks. The success that has been achieved with the REACH registrations and the availability of SDS for all our products clearly reflect the generally good level of product knowledge and the efficiency of our product data management.

Solvay's 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 in order to ensure availability throughout the full life cycle, beyond the commercialization period.

### Each GBU has a process for SDS compliance and distribution

Global Business Units must ensure that their SDSs are revised at least every three 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.

### Total success for 468 REACH EU registrations

	Number of substances	Substances for which Solvay is lead or sole registrant	Dossiers submitted to European Chemicals Agency	Dossiers accepted by ECHA
1 <sup>st</sup> registration phase 2010	167	76	276	100%
2 <sup>nd</sup> registration phase 2013	161	69	175	100%
<b>TOTAL</b>	<b>328</b>	<b>145</b>	<b>451</b>	<b>100%</b>
	Number of substances	Substances for which Solvay is lead or sole registrant	Dossiers submitted to European Chemicals Agency	Dossiers accepted by ECHA
3 <sup>rd</sup> Registration phase-Already registered	17	4	17	100%
3 <sup>rd</sup> Registration phase planned – deadline 2018	320	71	-	-

The REACH legislation has permitted a better knowledge of substances through the collection of new information. Since the beginning of the scheme (in 2010), Solvay has submitted 468 dossiers for registration, with a 100% success rate. Solvay was lead registrant for 149 substances. On the basis of the knowledge assembled within REACH, the GHS classification of Solvay products has also been updated.

The 3<sup>rd</sup> registration phase is now ongoing. This will focus on chemical substances produced or imported in lower quantities (between 1 and 100 tons per year). About 320 dossiers, covering 320 substances, are planned to be submitted before the end of May 2018. In addition, due to the availability of new information, or at the request of ECHA, updates of registration dossiers were submitted in 2014. Workshops and training sessions are organized to make our product stewards and HSE networks aware of REACH enforcement.

### Successful REACH inspections on sites in 2014

In 2014, two REACH inspections were conducted by the authorities with a successful outcome, one at the Rocchianica site (Italy) and the other at Aubervilliers (France). Eleven internal audits and 6 dedicated training sessions were organized in 2014 by Solvay's internal HSE teams to prepare its sites for future inspections.

### Extending shared rules on safety information for hazardous substances

Hazardous substances deserve particular attention. Solvay has a policy of managing product safety information centrally. Against a background of evolving legislation, effort has been invested in recent years in gaining a better understanding of how our products are used by customers, so as to record and assess any associated risks. In 2014, a particular focus was placed on merging the management of such information in both legacies, with a common system to be fully implemented by September 2015 that will:

- Standardize Product Safety Data Sheets, using shared rules and models across the Group;
- Ensure that product labels are consistent and regulatory compliant worldwide;
- Use common regulatory data, toxicological and ecotoxicological data and phrases library.

#### Product safety summaries: worldwide initiative by the chemical industry

GPS Safety Summaries are an important tool for providing the largest possible audience with information on the risks of chemical substances and how to handle them. They stem from a worldwide initiative to distribute information that is clear and easy to understand on the risks and safe use of chemicals. This initiative was launched in 2006 by a number of large chemical companies as part of the Global Product Strategy (GPS) of the International Council of Chemical Associations (ICCA). The GPS Safety Summary is not a legal document, unlike the Safety Data Sheet. However, it is appreciated as an important tool which helps to inform the public at large.

#### Solvay has prepared 130 "Safety Summaries"

Up to now, the two Solvay legacies have produced about 130 Safety Summaries for a large number of high-volume chemicals in commerce in the EU and North America (as part of chemical industry association initiatives). These are available to the public on and on Solvay websites. In 2014, Solvay started work on a new series of Product Safety Summaries for substances already registered by the REACH deadline 2013 and aims to harmonize the format of the documents between the two legacies.

## G4-PR4

### Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes

#### Product non-compliance

No worldwide indicator reported for product non-compliance

Solvay has a long track record of product regulatory compliance. For example, it has been able to ensure full compliance with the very demanding REACH regulation. In 2014, a further two official inspections were successfully passed at site level (Italy, Portugal), following the two successful inspections in 2013 (Italy, France).

Solvay has a centralized system for systematic regulatory monitoring, which informs business managers about key regulatory changes. This system will be further expanded.

## G4-PR5

### Results of surveys measuring customer satisfaction

Customer Satisfaction materiality assessment is not uniform for all the Global Business Units in the Group: its importance at corporate level has been raised following the full materiality analysis review performed in 2014 because it was material for business units representing a substantial part of the Group's financial results.

Net Promoter Score has been selected as the relevant indicator for consolidation at group level. Some business units use it already and a first assessment has been performed at group level for the 100 largest customers, representing about a third of the group revenue.

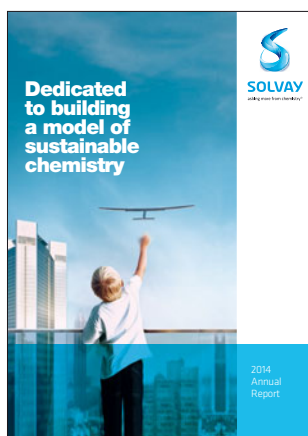
This report includes results of customer satisfaction surveys pioneered by some business unit, and covers more than half of the Group's turnover.

Global Business unit	Customer satisfaction indicator	2012	2013	2014	Comment
<b>Acetow</b>	Net promoter score*			24	NPS measurement started in 2014
	Overall Satisfaction	94%	96%	83%	Overall satisfaction (Overall, how satisfied are you with our product or service? very satisfied/satisfied/neutral/dissatisfied/very dissatisfied/not applicable). The number we refer to is equal to (satisfied + very satisfied). In 2013, under the circumstances of a short market, it has been more challenging to meet customers' expectations in terms of flexibility (change of orders, late orders, safety stock, etc.).
<b>Emerging Biochemicals</b>	Net Promoter Score	30% (2011)		48%	Performed so far only for Vinyls. For the GBU Scorecard, we plan on performing it on annual basis across the GBU.
<b>Silica</b>	Net Promoter Score	9%		22%	Silica uses the Net Promoter Score. 45 minutes interviews are conducted with the main contacts for key customers.
<b>Novecare</b>	"Overall satisfaction" and then move to "compare to competitor"	82% (NA)	76% (avg. NA, EU, LA)	95% (Asia)	Novecare manages customer satisfaction surveys by region since the reality of service to customers is by country and region. The survey is electronic and the rate to answer is between 15 to 20%. All functions within our customer are interviewed (purchasing, quality, R&I, etc.). The questions cover benchmark against competitors, consideration as global partner and also specific questions related to service in all processes (sales, supply chain, R&I). Based on customers feedback, satisfaction surveys have been switched from annual frequency to a frequency of 18 month-2 years.
<b>Specialty Polymers</b>	Net Promoter Score	32	22	26	SpP has been using the NPS indicator for measuring its customer satisfaction since its inception. From 2012 to 2014 SpP has followed a business line (BL) approach (we have 8 major BLs) determining the NPS for each business by running a business-centered VOC survey every two years using the consulting firm Strategex. The NPS for the GBU - reported - is calculated as the Contribution Margin weighted average of the individual BLs. Starting this year (2015) SpP will take a GBU-centered approach towards the VOC survey instead of the previous BL approach (I can give more explanation on the difference in the approaches off-line). SpP will maintain a two years' time cycle in carrying out its measurement of its customers' satisfaction divided in two waves instead of the previous eight. To make a long and complex story short and simple, the sharp decrease in NPS from 2012 to 2013 was mainly due to a deterioration of SpP reputation as a reliable supplier in a few BLs (we had a Force Majeure episode at our major production site in 2012). Investments and OEE initiatives have drastically improve that perception since then and we'll see their full impact in 2015 NPS.
<b>Polyamide &amp; Intermediates</b>	Overall Satisfaction (annual survey)	95% Answer rate: 42% of P&I WW customers	92.5% Answer rate: 44% of P&I WW customers	93.8% Answer rate: 39% of P&I WW customers	P&I is launching Customer Satisfaction survey on an annual basis (since 2005) to question all customers worldwide on 4 main categories ("Product & Services"; "Documentation"; "Sales Interface" and "Technical Interface"). The evaluation grid is as follows: very good/good/Poor/Very Poor/No opinion. The general satisfaction rates mentionned here are corresponding to "very good + good" average rate on the 4 categories. P&I is also rating customer satisfaction on "Sustainable Development/Corporate Social Responsibility" items. For each year survey, P&I is also asking specific questions in function of the need of getting information on a specific "focus" (such as: innovation; perception Rhodia/Solvay integration; Communication information & tools; leadership position). P&I is also following the customer answer rate for this survey.

\* Net promoter score is a customer loyalty metric developed by (and a registered trademark of) Fred Reichheld, Bain & Company, and Satmetrix.

# Contact

## ■ TO LEARN MORE ABOUT SOLVAY



BROCHURE



Download the 2014 Annual Report at:

<http://www.solvay.com/en/investors/index.html>



## ■ TO LEARN MORE ABOUT OUR SUSTAINABLE DEVELOPMENT APPROACH

Doing Business, being responsible **SOLVAY** way



BROCHURE

For more details:

<http://www.solvay.com/en/sustainability/index.html>



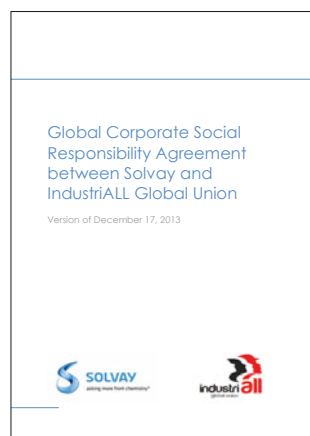
VIDEO



POSTER



## CSR Agreement signed with IndustriALL Global Union



AGREEMENT



BROCHURE



POSTER



VIDEO

## Sustainable Portfolio Management



BROCHURE



VIDEO



POSTER

G4-3 / G4-5 / G4-31

### Publication Management :

Group Sustainable Manager Sustainable Development  
Jacques Kheliff  
Isabelle Cornu (isabelle.cornu@solvay.com)  
Leila Jmili (leila.jmili@solvay.com)

### SOLVAY SA

310 Rue de Ransbeek  
1120, Brussels, Belgium  
T: +32 2 264 2111  
F: +32 2 264 3061







**Solvay sa**

Rue de Ransbeek, 310  
1120 Bruxelles  
Belgique  
T: + 32 2 264 2111  
F: + 32 2 264 3061

[www.solvay.com](http://www.solvay.com)

Suivez l'actualité du Groupe au quotidien sur

 [www.twitter.com/solvaygroup](https://www.twitter.com/solvaygroup)

 [www.facebook.com/solvaygroup](https://www.facebook.com/solvaygroup)

 [www.youtube.com/solvaygroup](https://www.youtube.com/solvaygroup)