

# ECONOMICS

## Net sales, operating result (EBIT) and research and development costs, by business sector

| € million               | Healthcare | Life Science | Performance Materials | Group <sup>1</sup> |
|-------------------------|------------|--------------|-----------------------|--------------------|
| <b>2016</b>             |            |              |                       |                    |
| Net sales               | 6,855      | 5,658        | 2,511                 | <b>15,024</b>      |
| Operating result (EBIT) | 1,593      | 556          | 823                   | <b>2,481</b>       |
| R&D costs               | 1,496      | 260          | 213                   | <b>1,976</b>       |
| <b>2017</b>             |            |              |                       |                    |
| Net sales               | 6,999      | 5,882        | 2,446                 | <b>15,327</b>      |
| Operating result (EBIT) | 1,447      | 834          | 689                   | <b>2,525</b>       |
| R&D costs               | 1,632      | 241          | 225                   | <b>2,140</b>       |

1 As a non-operating segment, Corporate and Other is not shown here as a separate item, but rather under Segment Reporting in our 2017 Annual Report.

# compliance



Part of the non-financial report

## Internal audits on corruption and Human Rights Charter

|                                                                                             | 2014 | 2015 | 2016 <sup>1</sup> | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany <sup>2</sup> |
|---------------------------------------------------------------------------------------------|------|------|-------------------|-------------------|----------------------------------------------------------------------|
| Number of audits relating to corruption                                                     | 36   | 49   | 55                | 50                | 13                                                                   |
| % of audits relating to corruption                                                          | 68   | 64   | 68                | 65                | 17                                                                   |
| Number of audits relating to the work-<br>place requirements of our Human Rights<br>Charter | 32   | 41   | 47                | 45                | 12                                                                   |

1 Includes Sigma-Aldrich as of 2016

2 Includes global audits which are conducted at the headquarters in Darmstadt and/or the management of the audited function is reporting into KGaA.

In 2017, we audited 16% of all Group subsidiaries (status June 2017, excluding minority holdings), covering approximately 30% of all sales generated between the third quarter of 2016 and the second quarter of 2017.

In 2017, during 45 of our audits conducted in 22 countries, we additionally reviewed workplace parameters as per our Human Rights Charter. No violations were identified.

## Reported compliance violations

|                                                                                                 | 2014 | 2015 | 2016 <sup>1</sup> | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-------------------------------------------------------------------------------------------------|------|------|-------------------|-------------------|---------------------------------------------------------|
| <b>Total number of reported compliance violations</b>                                           |      |      |                   |                   |                                                         |
| Number of reported compliance incidents                                                         | 26   | 33   | 36                | 39                | 1                                                       |
| Number of confirmed cases                                                                       | 11   | 8    | 12                | 14                | 1                                                       |
| <b>confirmed cases by category</b>                                                              |      |      |                   |                   |                                                         |
| Violation of the Human Rights Charter                                                           | 1    | 0    | 2                 | 0                 | 0                                                       |
| Bribery and Corruption                                                                          | 2    | 0    | 2                 | 1                 | 0                                                       |
| Violation of the Pharmaceutical Guidelines                                                      | 2    | 2    | 4                 | 2                 | 0                                                       |
| Violation of Data Privacy and Confidentiality Guidelines                                        | 0    | 1    | 0                 | 2                 | 1                                                       |
| Manipulation of Business Documents                                                              | 0    | 0    | 2                 | 1                 | 0                                                       |
| Violation of cartel laws and fair competition rules                                             | 0    | 1    | 0                 | 0                 | 0                                                       |
| Infringements in the areas of finance, accounting and banking                                   | 0    | 0    | 0                 | 0                 | 0                                                       |
| Theft and fraudulent Actions against the Group                                                  | 1    | 2    | 1                 | 1                 | 0                                                       |
| Other violations of Compliance Principles for the relations with Business Partners of the Group | 0    | 0    | 1                 | 2                 | 0                                                       |
| Other violations of values, internal guidelines or legal requirements                           | 5    | 2    | 0                 | 5                 | 0                                                       |

1 Includes Sigma-Aldrich as of 2016

In 2017 there was a total of 14 confirmed compliance cases, 2 of which were already reported in 2016, but closed in 2017.

## Compliance training

|                                                                                  | 2014 <sup>1</sup> | 2015          | 2016 <sup>2</sup> | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|----------------------------------------------------------------------------------|-------------------|---------------|-------------------|-------------------|---------------------------------------------------------|
| <b>Total number of persons trained on anti-corruption guidelines<sup>3</sup></b> | <b>7,519</b>      | <b>20,404</b> | <b>29,764</b>     | <b>17,044</b>     | <b>2,326</b>                                            |
| <b>Total number of employees trained on anti-corruption guidelines</b>           | <b>5,496</b>      | <b>17,378</b> | <b>25,889</b>     | <b>13,345</b>     | <b>1,450</b>                                            |
| % of employees trained on anti-corruption                                        | 14                | 43            | 51                | 25                | 14                                                      |
| <b>by employee category</b>                                                      |                   |               |                   |                   |                                                         |
| Number of Role 2+ employees trained on anti-corruption                           | 3,071             | 12,747        | 14,379            | 7,080             | 635                                                     |
| % of Role 2+ employees trained on anti-corruption                                | 17                | 64            | 84                | 27                | 13                                                      |
| % of employees below Role 2 trained on anti-corruption                           | 12                | 22            | 34                | 24                | 15                                                      |
| <b>by region (%)<sup>4</sup></b>                                                 |                   |               |                   |                   |                                                         |
| Europe                                                                           | –                 | –             | 54                | 18                | 14                                                      |
| North America                                                                    | –                 | –             | 57                | 46                | not applicable                                          |
| Asia-Pacific (APAC)                                                              | –                 | –             | 38                | 25                | not applicable                                          |
| Latin America                                                                    | –                 | –             | 52                | 19                | not applicable                                          |
| Middle East and Africa (MEA)                                                     | –                 | –             | 66                | 29                | not applicable                                          |

1 In Q1 – Q3 2014, Group Compliance performed a thorough analysis and review of its Compliance Training Program. No courses were scheduled for these quarters.

2 Includes Sigma-Aldrich as of 2016

3 Includes contractors, external supervised workers (e.g. temps) and contract partners working on-site who were trained on anti-corruption guidelines (2017: 3,699).

4 As of 2016, we are also reporting the training rate by region. No such data was tracked for the preceding years.

In order to address the special responsibility held by management personnel, as well as by staff with HR responsibility, these employees are increasingly receiving training on anti-corruption guidelines. This applies to all employees rated Role 2+.

Our compliance and anti-corruption principles are communicated to all our business partners, who undergo a Business Partner Risk Management (BPRM) process.

Training increased in 2016 due to the initial integration of employees of Sigma-Aldrich, a company acquired at the end of 2015.

## Legal actions

|                                                                                                                                                                       | 2014     | 2015 <sup>1</sup> | 2016     | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|----------|-------------------|---------------------------------------------------------|
| <b>Total number<sup>2</sup> of legal actions pending or completed (for anti-competitive behavior, violations of anti-trust or violations of monopoly legislation)</b> | <b>2</b> | <b>2</b>          | <b>2</b> | <b>3</b>          | <b>2</b>                                                |
| pending                                                                                                                                                               | 2        | 2                 | 2        | 3                 | 2                                                       |
| completed                                                                                                                                                             | 0        | 0                 | 0        | 0                 | 0                                                       |

1 Includes Sigma-Aldrich as of 2015

2 As published in the annual reports, the herein listed total number of legal actions refers to the significant legal risks as per the company's definition. The significance of legal risks is based on potential negative effects on projected financial objectives as well as on the probability of occurrence.

For further information please see our annual reports:

- Annual Report 2014, pages 130-131 and pages 213-215, no. 48
- Annual Report 2015, pages 128-129 and pages 212-213, no. 27
- Annual Report 2016, pages 135-136 and pages 228-229, no. 26
- Annual Report 2017, pages 148-150 and pages 252-254, no. 27

# products



Part of the non-financial report

## Customer privacy<sup>1</sup>

|                                                                        | 2014 | 2015 | 2016 | 2017 <sup>2</sup> |
|------------------------------------------------------------------------|------|------|------|-------------------|
| Total number of substantiated complaints received from outside parties | 0    | 0    | 0    | 0                 |
| Total number of complaints from regulatory bodies                      | 1    | 0    | 0    | 0                 |
| Total number of identified leaks, thefts, or losses of customer data   | 0    | 0    | 1    | 0                 |

1 This data only reflects incidents classified as significant.

2 Includes Sigma-Aldrich as of 2017

# Employees



Part of the non-financial report

## Total number of employees

| As of Dec. 31                    | 2014          | 2015 <sup>1</sup> | 2016          | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|----------------------------------|---------------|-------------------|---------------|-------------------|---------------------------------------------------------|
| <b>Total number of employees</b> | <b>39,639</b> | <b>49,613</b>     | <b>50,414</b> | <b>52,941</b>     | <b>10,677</b>                                           |
| Men                              | 23,273        | 28,997            | 28,848        | 30,083            | 6,779                                                   |
| Women                            | 16,366        | 20,616            | 21,566        | 22,858            | 3,898                                                   |

1 Includes Sigma-Aldrich as of 2015

## Number of employees by hierarchical level<sup>1</sup>

| As of Dec. 31                             | 2014          | 2015 <sup>2</sup> | 2016 <sup>2</sup> | 2017<br>The Group <sup>2</sup> | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-------------------------------------------|---------------|-------------------|-------------------|--------------------------------|---------------------------------------------------------|
| <b>Total employees</b>                    | <b>39,639</b> | <b>49,613</b>     | <b>50,414</b>     | <b>52,941</b>                  | <b>10,677</b>                                           |
| Senior management (Role 6+)               | 118           | 146               | 181               | 197                            | 90                                                      |
| Middle management (Role 4 & 5)            | 1,973         | 2,211             | 2,685             | 2,927                          | 1,037                                                   |
| Low management (Role 3)                   | 6,109         | 6,622             | 8,139             | 8,904                          | 2,451                                                   |
| Other employees (below Role 3)            | 31,439        | 40,634            | 39,409            | 40,913                         | 7,099                                                   |
| <b>% of women (total)</b>                 | <b>41</b>     | <b>41</b>         | <b>43</b>         | <b>43</b>                      | <b>37</b>                                               |
| thereof in senior management (Role 6+)    | 20            | 21                | 25                | 30                             | 16                                                      |
| thereof in middle management (Role 4 & 5) | 539           | 611               | 805               | 917                            | 319                                                     |
| thereof in low management (Role 3)        | 2,385         | 2,636             | 3,361             | 3,714                          | 950                                                     |
| thereof other employees (below Role 3)    | 13,422        | 17,348            | 17,375            | 18,197                         | 2,613                                                   |
| <b>% of men (total)</b>                   | <b>59</b>     | <b>59</b>         | <b>57</b>         | <b>57</b>                      | <b>63</b>                                               |
| thereof in senior management (Role 6+)    | 98            | 125               | 156               | 167                            | 74                                                      |
| thereof in middle management (Role 4 & 5) | 1,434         | 1,600             | 1,880             | 2,010                          | 718                                                     |
| thereof in low management (Role 3)        | 3,724         | 3,986             | 4,778             | 5,190                          | 1,501                                                   |
| thereof other employees (below Role 3)    | 18,017        | 23,286            | 22,034            | 22,716                         | 4,486                                                   |
| <b>by age group</b>                       |               |                   |                   |                                |                                                         |
| <b>Up to 29 years old (%)</b>             | <b>15</b>     | <b>15</b>         | <b>15</b>         | <b>15</b>                      | <b>15</b>                                               |
| thereof in senior management (Role 6+)    | 0             | 0                 | 0                 | 0                              | 0                                                       |
| thereof in middle management (Role 4 & 5) | 6             | 5                 | 7                 | 3                              | 3                                                       |
| thereof in low management (Role 3)        | 127           | 130               | 183               | 194                            | 100                                                     |
| thereof other employees (below Role 3)    | 5,750         | 7,424             | 7,229             | 7,479                          | 1,486                                                   |
| <b>30 to 49 years old (%)</b>             | <b>64</b>     | <b>64</b>         | <b>62</b>         | <b>62</b>                      | <b>55</b>                                               |
| thereof in senior management (Role 6+)    | 64            | 68                | 76                | 72                             | 33                                                      |
| thereof in middle management (Role 4 & 5) | 1,264         | 1,407             | 1,670             | 1,782                          | 648                                                     |
| thereof in low management (Role 3)        | 4,424         | 4,770             | 5,784             | 6,308                          | 1,670                                                   |
| thereof other employees (below Role 3)    | 19,703        | 24,815            | 23,996            | 24,733                         | 3,487                                                   |
| <b>50 years or older (%)</b>              | <b>21</b>     | <b>21</b>         | <b>23</b>         | <b>23</b>                      | <b>30</b>                                               |
| thereof in senior management (Role 6+)    | 54            | 78                | 105               | 125                            | 57                                                      |

1 In 2017, we switched our job architecture from a Global Grading System to Roles. Figures have been retroactively adjusted for previous years.

2 From 2015 on, these figures include Sigma-Aldrich, however as of Dec. 31, 2017 the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. These employees are included under "thereof other employees (Role 3 and below)".

## Number of employees by hierarchical level<sup>1</sup>

| As of Dec. 31                             | 2014  | 2015 <sup>2</sup> | 2016 <sup>2</sup> | 2017<br>The Group <sup>2</sup> | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-------------------------------------------|-------|-------------------|-------------------|--------------------------------|---------------------------------------------------------|
| thereof in middle management (Role 4 & 5) | 703   | 799               | 1,008             | 1,142                          | 386                                                     |
| thereof in low management (Role 3)        | 1,558 | 1,722             | 2,172             | 2,402                          | 681                                                     |
| thereof other employees (below Role 3)    | 5,986 | 8,395             | 8,184             | 8,701                          | 2,126                                                   |

1 In 2017, we switched our job architecture from a Global Grading System to Roles. Figures have been retroactively adjusted for previous years.

2 From 2015 on, these figures include Sigma-Aldrich, however as of Dec. 31, 2017 the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. These employees are included under "thereof other employees (Role 3 and below)".

## Average number of employees by functional area

| Average number of employees                  | 2014 <sup>1</sup> | 2015 <sup>2</sup> | 2016 <sup>2</sup> | 2017 <sup>2</sup> |
|----------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| <b>Group</b>                                 | <b>38,930</b>     | <b>41,511</b>     | <b>50,439</b>     | <b>52,053</b>     |
| <b>Thereof women</b>                         | <b>16,110</b>     | <b>17,180</b>     | <b>21,136</b>     | <b>22,353</b>     |
| Production                                   | 10,176            | 11,563            | 14,829            | 15,571            |
| Thereof women                                | 3,202             | 3,642             | 4,698             | 5,059             |
| Logistics/ Supply Chain <sup>3</sup>         | 2,207             | 2,581             | 3,955             | 3,729             |
| Thereof women                                | 774               | 913               | 1,459             | 1,442             |
| Marketing and Sales/ Commercial <sup>3</sup> | 12,113            | 12,871            | 14,887            | 15,115            |
| Thereof women                                | 4,814             | 5,204             | 6,401             | 6,609             |
| Administration                               | 6,342             | 6,763             | 8,190             | 9,286             |
| Thereof women                                | 3,557             | 3,757             | 4,421             | 4,798             |
| Research and Development                     | 4,738             | 5,097             | 6,249             | 6,789             |
| Thereof women                                | 2,534             | 2,674             | 3,274             | 3,591             |
| Infrastructure and Other                     | 3,354             | 2,636             | 2,329             | 1,564             |
| Thereof women                                | 1,230             | 990               | 883               | 854               |

1 Average headcount (HC) 2014 is calculated based on the End HC of the last 5 quarters divided by 5.

2 The average employee headcount for 2015 through 2017 is calculated by adding up all employees at the end of each of the last 13 months, and dividing this total by 13. Employees of Sigma-Aldrich, a company acquired in November 2015, are only included in the employee headcount calculations as of November 2015.

3 In conjunction with the new job architecture implemented in 2017, some functional areas have been renamed and reorganized. Due to the new structure from 2017 on, it will only be possible to deliver a limited trend forecast in a year-on-year comparison.

## Number of employees by region

| As of Dec. 31                                | 2014          | 2015 <sup>1</sup> | 2016          | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|----------------------------------------------|---------------|-------------------|---------------|-------------------|---------------------------------------------------------|
| <b>Total</b>                                 | <b>39,639</b> | <b>49,613</b>     | <b>50,414</b> | <b>52,941</b>     | <b>10,677</b>                                           |
| <b>Europe</b>                                | <b>20,537</b> | <b>23,429</b>     | <b>24,438</b> | <b>25,980</b>     | <b>10,677</b>                                           |
| women                                        | 8,893         | 10,316            | 10,884        | 11,627            | <b>3,898</b>                                            |
| women (%)                                    | 43            | 44                | 45            | 45                | 37                                                      |
| Number of employees with temporary contracts | 906           | 1,079             | 1,031         | 1,279             | 513                                                     |
| % of employees with temporary contracts      | 4             | 5                 | 4             | 5                 | 5                                                       |
| <b>North America</b>                         | <b>5,092</b>  | <b>9,794</b>      | <b>10,037</b> | <b>10,520</b>     | <b>0</b>                                                |
| women                                        | 2,272         | 4,183             | 4,308         | 4,518             | not applicable                                          |
| women (%)                                    | 45            | 43                | 43            | 43                | not applicable                                          |
| Number of employees with temporary contracts | 18            | 22                | 122           | 138               | not applicable                                          |
| % of employees with temporary contracts      | 0.4           | 0.2               | 1             | 1                 | not applicable                                          |
| <b>Asia-Pacific (APAC)</b>                   | <b>9,488</b>  | <b>11,096</b>     | <b>10,754</b> | <b>11,294</b>     | <b>0</b>                                                |
| women                                        | 3,176         | 3,706             | 3,981         | 4,298             | not applicable                                          |
| women (%)                                    | 33            | 33                | 37            | 38                | not applicable                                          |
| Number of employees with temporary contracts | 156           | 1,888             | 2,231         | 2,603             | not applicable                                          |
| % of employees with temporary contracts      | 2             | 17                | 21            | 23                | not applicable                                          |
| <b>Latin America</b>                         | <b>3,883</b>  | <b>4,352</b>      | <b>4,140</b>  | <b>4,050</b>      | <b>0</b>                                                |
| women                                        | 1,745         | 1,986             | 1,910         | 1,896             | not applicable                                          |
| women (%)                                    | 45            | 46                | 46            | 47                | not applicable                                          |
| Number of employees with temporary contracts | 28            | 43                | 40            | 40                | not applicable                                          |
| % of employees with temporary contracts      | 1             | 1                 | 1             | 1                 | not applicable                                          |
| <b>Middle East and Africa (MEA)</b>          | <b>639</b>    | <b>942</b>        | <b>1,045</b>  | <b>1,097</b>      | <b>0</b>                                                |
| women                                        | 280           | 425               | 483           | 519               | not applicable                                          |
| women (%)                                    | 44            | 45                | 46            | 47                | not applicable                                          |
| Number of employees with temporary contracts | 111           | 127               | 153           | 172               | not applicable                                          |
| % of employees with temporary contracts      | 17            | 13                | 15            | 16                | not applicable                                          |

1 Includes Sigma-Aldrich as of 2015

External contractors are currently not logged in our employee data system, nor do we currently have any plans to integrate them.

## Employees by business sector

| As of Dec. 31                          | 2014          | 2015 <sup>1</sup> | 2016          | 2017          |
|----------------------------------------|---------------|-------------------|---------------|---------------|
| <b>Healthcare employees</b>            | <b>17,757</b> | <b>18,566</b>     | <b>18,837</b> | <b>19,795</b> |
| Thereof women                          | 8,130         | 8,522             | 9,090         | 9,656         |
| Thereof women (%)                      | 46            | 46                | 48            | 49            |
| <b>Life Science employees</b>          | <b>9,796</b>  | <b>18,611</b>     | <b>19,178</b> | <b>19,607</b> |
| Thereof women                          | 4,134         | 7,883             | 7,928         | 8,276         |
| Thereof women (%)                      | 42            | 42                | 41            | 42            |
| <b>Performance Materials employees</b> | <b>5,995</b>  | <b>6,228</b>      | <b>5,469</b>  | <b>5,529</b>  |
| Thereof women                          | 1,498         | 1,531             | 1,427         | 1,455         |
| Thereof women (%)                      | 25            | 25                | 26            | 26            |

1 Includes Sigma-Aldrich as of 2015

## Employees by contract type

| As of Dec. 31                                | 2014          | 2015 <sup>1</sup> | 2016          | 2017          |
|----------------------------------------------|---------------|-------------------|---------------|---------------|
| <b>Total employees</b>                       | <b>39,639</b> | <b>49,613</b>     | <b>50,414</b> | <b>52,941</b> |
| Number of employees with permanent contracts | 38,410        | 46,454            | 46,837        | 48,709        |
| % of employees with permanent contracts      | 97            | 94                | 93            | 92            |
| thereof women                                | 15,826        | 19,034            | 19,741        | 20,741        |
| thereof women (%)                            | 41            | 41                | 42            | 43            |
| Number of employees with temporary contracts | 1,219         | 3,159             | 3,577         | 4,232         |
| % of employees with temporary contracts      | 3             | 6                 | 7             | 8             |
| thereof women                                | 536           | 1,563             | 1,744         | 2,117         |
| thereof women (%)                            | 44            | 49                | 49            | 50            |
|                                              |               |                   |               |               |
| full-time employees                          | 37,573        | 47,292            | 48,056        | 50,498        |
| % full-time                                  | 98            | 95                | 95            | 95            |
| thereof women                                | 14,497        | 18,557            | 19,457        | 20,677        |
| thereof women (%)                            | 39            | 39                | 40            | 41            |
| part-time employees                          | 2,066         | 2,321             | 2,358         | 2,443         |
| % part-time                                  | 5             | 5                 | 5             | 5             |
| thereof women                                | 1,869         | 2,059             | 2,109         | 2,181         |
| thereof women (%)                            | 90            | 89                | 89            | 89            |

1 Includes Sigma-Aldrich as of 2015

## New employees

|                                                   | 2014         | 2015 <sup>1</sup> | 2016         | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|---------------------------------------------------|--------------|-------------------|--------------|-------------------|---------------------------------------------------------|
| <b>Total number of new employee hires</b>         | <b>6,212</b> | <b>5,710</b>      | <b>7,085</b> | <b>7,285</b>      | <b>1,032</b>                                            |
| <b>by age group</b>                               |              |                   |              |                   |                                                         |
| Up to 29 years old                                | 2,305        | 2,088             | 2,930        | 2,940             | 435                                                     |
| 30 to 49 years old                                | 3,361        | 3,252             | 3,736        | 3,848             | 543                                                     |
| 50 or older                                       | 546          | 370               | 419          | 497               | 54                                                      |
| <b>by gender</b>                                  |              |                   |              |                   |                                                         |
| Women                                             | 2,513        | 2,450             | 3,388        | 3,412             | 462                                                     |
| Men                                               | 3,689        | 3,260             | 3,697        | 3,873             | 570                                                     |
| <b>by region</b>                                  |              |                   |              |                   |                                                         |
| Europe                                            | 2,312        | 2,119             | 2,689        | 3,058             | 1,032                                                   |
| North America                                     | 826          | 730               | 1,348        | 1,603             | not applicable                                          |
| Asia-Pacific (APAC)                               | 2,298        | 1,913             | 2,201        | 1,955             | not applicable                                          |
| Latin America                                     | 619          | 780               | 636          | 497               | not applicable                                          |
| Middle East and Africa (MEA)                      | 157          | 168               | 211          | 172               | not applicable                                          |
| <b>Rate of new employee hires<sup>2</sup> (%)</b> | <b>16</b>    | <b>14</b>         | <b>14</b>    | <b>14</b>         | <b>10</b>                                               |
| <b>by age group<sup>3</sup></b>                   |              |                   |              |                   |                                                         |
| Up to 29 years old                                | 37           | 37                | 41           | 40                | 42                                                      |
| 30 to 49 years old                                | 54           | 57                | 53           | 53                | 53                                                      |
| 50 or older                                       | 9            | 6                 | 6            | 7                 | 5                                                       |
| <b>by gender<sup>3</sup></b>                      |              |                   |              |                   |                                                         |
| Women                                             | 41           | 43                | 48           | 47                | 45                                                      |
| Men                                               | 59           | 57                | 52           | 53                | 55                                                      |
| <b>by region<sup>3</sup></b>                      |              |                   |              |                   |                                                         |
| Europe                                            | 37           | 37                | 38           | 42                | 100                                                     |
| North America                                     | 13           | 13                | 19           | 22                | not applicable                                          |
| Asia-Pacific (APAC)                               | 37           | 33                | 31           | 27                | not applicable                                          |
| Latin America                                     | 10           | 14                | 9            | 7                 | not applicable                                          |
| Middle East and Africa (MEA)                      | 3            | 3                 | 3            | 2                 | not applicable                                          |

1 These figures exclude the 8,975 Sigma-Aldrich employees, who are not classified as new hires because they joined our company as part of the Sigma-Aldrich acquisition.

2 Formula for calculating the rate of new employee hires: Total number of new employee hires divided by Number of employees at the end of the fiscal year.

3 Formula for calculating the rate of new employee hires by age/gender/region: New employee hires of the focus group divided by the total number of new employee hires. In consequence of the modified calculation method and the new composition of our regions effective January 1, 2015 corresponding figures for the preceding year have been retroactively adjusted.

## Staff turnover<sup>1</sup>

|                                   | 2014 <sup>2</sup> | 2015 <sup>3</sup> | 2016 <sup>3,4</sup> | 2017<br>The Group <sup>3</sup> | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany <sup>3</sup> |
|-----------------------------------|-------------------|-------------------|---------------------|--------------------------------|----------------------------------------------------------------------|
| <b>Total turnover rate</b>        | <b>11.01</b>      | <b>10.38</b>      | <b>12.07</b>        | <b>9.05</b>                    | <b>2.35</b>                                                          |
| <b>Turnover rate by gender</b>    |                   |                   |                     |                                |                                                                      |
| Men                               | 10.75             | 10.13             | 12.87               | 8.75                           | 2.18                                                                 |
| Women                             | 11.38             | 10.73             | 10.96               | 9.46                           | 2.43                                                                 |
| <b>Turnover rate by age group</b> |                   |                   |                     |                                |                                                                      |
| Up to 29 years old                | 18.71             | 17.49             | 19.20               | 13.66                          | 3.51                                                                 |
| 30 to 49 years old                | 9.72              | 9.69              | 11.37               | 8.38                           | 2.08                                                                 |
| 50 or older                       | 9.49              | 8.08              | 9.19                | 7.87                           | 2.22                                                                 |
| <b>Turnover rate by region</b>    |                   |                   |                     |                                |                                                                      |
| Europe                            | 7.05              | 6.22              | 6.23                | 6.22                           | 2.35                                                                 |
| North America                     | 12.45             | 12.72             | 11.50               | 11.02                          | not applicable                                                       |
| Asia-Pacific (APAC)               | 17.55             | 15.95             | 22.37               | 12.53                          | not applicable                                                       |
| Latin America                     | 13.67             | 15.29             | 18.85               | 13.74                          | not applicable                                                       |
| Middle East and Africa (MEA)      | 13.62             | 12.00             | 10.80               | 11.22                          | not applicable                                                       |
| <b>Total number of leavers</b>    | <b>4,364</b>      | <b>4,168</b>      | <b>6,087</b>        | <b>4,710</b>                   | <b>244</b>                                                           |
| <b>by gender</b>                  |                   |                   |                     |                                |                                                                      |
| Men                               | 2,502             | 2,386             | 3,771               | 2,596                          | 162                                                                  |
| Women                             | 1,862             | 1,782             | 2,316               | 2,114                          | 82                                                                   |
| <b>by age group</b>               |                   |                   |                     |                                |                                                                      |
| Up to 29 years old                | 1,102             | 943               | 1,464               | 1,058                          | 55                                                                   |
| 30 to 49 years old                | 2,474             | 2,505             | 3,589               | 2,713                          | 120                                                                  |
| 50 or older                       | 788               | 720               | 1,034               | 939                            | 69                                                                   |
| <b>by region</b>                  |                   |                   |                     |                                |                                                                      |
| Europe                            | 1,447             | 1,290             | 1,490               | 1,488                          | 244                                                                  |
| North America                     | 634               | 638               | 1,132               | 1,143                          | not applicable                                                       |
| Asia-Pacific (APAC)               | 1,665             | 1,540             | 2,543               | 1,387                          | not applicable                                                       |
| Latin America                     | 531               | 618               | 814                 | 570                            | not applicable                                                       |
| Middle East and Africa (MEA)      | 87                | 82                | 108                 | 122                            | not applicable                                                       |

1 The table contains unadjusted turnover rates. The rate excludes employees who depart due to parental leave or a long-term illness, as well as employees who are transitioning to the non-working phase of partial retirement.

2 Employee turnover for fiscal year 2014 is calculated as follows: Total number of leavers of the past 12 months multiplied by 100 divided by the employee headcount as of December 31.

3 Employee headcount for fiscal 2015, 2016 and 2017 is calculated as follows: Total number of leavers from the past 12 months divided by the average employee headcount multiplied by 100.

4 Includes Sigma-Aldrich as of 2016

## Work-related accidents<sup>1</sup>

|                                                                                                                                     | 2014       | 2015 <sup>2</sup> | 2016             | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------|------------------|-------------------|---------------------------------------------------------|
| <b>Lost Time Injury Rate (LTIR = work-<br/>place accidents resulting in missed<br/>days of work per one million man-<br/>hours)</b> | <b>1.8</b> | <b>1.4</b>        | <b>1.3</b>       | <b>1.5</b>        | <b>3.1</b>                                              |
| <b>by region</b>                                                                                                                    |            |                   |                  |                   |                                                         |
| Europe                                                                                                                              | 2.9        | 2.6               | 2.2 <sup>3</sup> | 2.4               | 3.1                                                     |
| North America                                                                                                                       | 1.0        | 0.9               | 1.1              | 1.0               | not applicable                                          |
| Asia-Pacific (APAC)                                                                                                                 | 0.5        | 0.3               | 0.4              | 0.3               | not applicable                                          |
| Latin America                                                                                                                       | 1.3        | 0.7               | 0.4              | 1.3               | not applicable                                          |
| Middle East and Africa (MEA)                                                                                                        | 0.9        | 0.5               | 1.6              | 0.0               | not applicable                                          |
| <b>Number of deaths</b>                                                                                                             | <b>2</b>   | <b>2</b>          | <b>0</b>         | <b>0</b>          | <b>0</b>                                                |
| <b>by region</b>                                                                                                                    |            |                   |                  |                   |                                                         |
| Europe                                                                                                                              | 0          | 1                 | 0                | 0                 | 0                                                       |
| North America                                                                                                                       | 0          | 1                 | 0                | 0                 | 0                                                       |
| Asia-Pacific (APAC)                                                                                                                 | 1          | 0                 | 0                | 0                 | 0                                                       |
| Latin America                                                                                                                       | 1          | 0                 | 0                | 0                 | 0                                                       |
| Middle East and Africa (MEA)                                                                                                        | 0          | 0                 | 0                | 0                 | 0                                                       |
| <b>by gender</b>                                                                                                                    |            |                   |                  |                   |                                                         |
| Women                                                                                                                               | 1          | 1                 | 0                | 0                 | 0                                                       |
| Men                                                                                                                                 | 1          | 1                 | 0                | 0                 | 0                                                       |

1 Including supervised workers

2 Includes Sigma-Aldrich as of 2015

3 Figure retroactively adjusted.

Both our employees as well as contractors have been included in the calculation of these indicators.

Through the LTIR, we record work-related accidents that involve at least one day of missed work. A work-related accident is an injury that results from the type of work, in the course of doing said work, and that has no internal cause. Work-related accidents are considered relevant if they occur on the premises, on business trips, during goods transport, as a result of external influences (e.g. natural disasters), or due to criminal acts involving personal injury. Commuting accidents and accidents during company sporting activities are not included. First-aid incidents are generally not included in the LTIR since these usually do not result in more than one day of missed work.

By 2020, we intend to sustainably lower the LTIR to 1.5. The aim is to permanently stabilize or outperform this challenging number, which we achieved for the first time in 2015.

We have defined the LTIR as a key indicator for the Group. Therefore, we do not publish any other indicators such as work-place accidents, lost days or days of absence. The LTIR is not broken down by gender as this differentiation is not relevant to our strategic planning.

For Merck KGaA, Darmstadt, Germany (about 20% of the employees of the Group), we only report work-related illnesses if these have been diagnosed and verified by a physician. In 2017 period, no cases of work-induced illness were verified.

## Employees who regularly receive a performance and development evaluation

|                                                                            | 2014 <sup>1</sup> | 2015 <sup>2</sup> | 2016 <sup>3</sup> | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|----------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|---------------------------------------------------------|
| <b>% of employees who receive a performance and development evaluation</b> | <b>79</b>         | <b>88</b>         | <b>97</b>         | <b>-4</b>         | <b>-4</b>                                               |
| <b>by gender</b>                                                           |                   |                   |                   |                   |                                                         |
| Women                                                                      | 84                | 90                | 97                | -4                | -4                                                      |
| Men                                                                        | 77                | 87                | 97                | -4                | -4                                                      |
| <b>by employee category</b>                                                |                   |                   |                   |                   |                                                         |
| Senior management<br>(Global Grade above 17)                               | 97                | 100               | 100               | -4                | -4                                                      |
| Low and middle management<br>(Global Grade 14–17)                          | 96                | 100               | 100               | -4                | -4                                                      |
| Other employees<br>(Global Grade below 14)                                 | 78                | 88                | 97                | -4                | -4                                                      |

1 The 2014 data is based on a reporting date of March 2, 2015.

2 The 2015 data is based on a reporting date of February 29, 2016.

3 From 2016 on, figures include Sigma-Aldrich, but as of Dec. 31 2017, the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany and of Allergopharma.

4 Figure will be available on Dec. 31, 2018.

Regular feedback and employee performance evaluations are essential to fairly ranking individual performance and to helping all employees follow their own career path. Our globally uniform Performance and Talent Management Process requires annual feedback meetings and performance assessments for all employees rated Role 2 and up in the job grading system that was used in 2017 (corresponds to Global Grade 10 or higher in the job grading system that was used until the end of 2016). Apart from evaluating employee performance, this helps us to identify individual development opportunities.

When it comes to applying this process, our individual subsidiaries can decide for themselves whether to include employees rated below Role 2 (corresponds to Global Grade 9 or lower in the job grading system that was used until the end of 2016). In Germany, all permanent employees have been participating in the Performance and Talent Management Process since 2013. In 2017, a total of 51,240 employees worldwide were involved in the process. The Performance and Talent Management Process is coordinated via our online platform HR4You.

## Internationality of employees

| As of Dec. 31                                                     | 2014 <sup>1</sup> | 2015 <sup>2</sup> | 2016 <sup>3</sup> | 2017<br>The Group <sup>3</sup> | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|-------------------------------------------------------------------|-------------------|-------------------|-------------------|--------------------------------|---------------------------------------------------------|
| Number of nationalities                                           | 122               | 122               | 129               | 131                            | 97                                                      |
| Number of nationalities in management positions (Role 4 or above) | 67                | 64                | 70                | 65                             | 41                                                      |
| % of non-Germans in management positions (Role 4 or above)        | 60                | 61                | 65                | 64                             | 17                                                      |

1 These figures do not include the employees of AZ Electronic Materials, a company that was acquired in July 2014. As of December 31, 2014, the job grading system had not yet been implemented there.

2 These figures do not include the employees of Sigma-Aldrich, a company that was acquired in November 2015. As of December 31, 2015, the job grading system had not yet been implemented there.

3 From 2016 on, figures include Sigma-Aldrich. However, as of Dec. 31 2017, the job grading system had not yet been implemented for employees of Sigma-Aldrich legal entities in Germany or for employees of Allergopharma.

## Employee age by region

As of Dec. 31

| Number of employees    | Worldwide     | North America | Europe (including Germany) | Germany <sup>1</sup> | Asia-Pacific (APAC) | Latin America | Middle East and Africa (MEA) |
|------------------------|---------------|---------------|----------------------------|----------------------|---------------------|---------------|------------------------------|
| <b>2016</b>            |               |               |                            |                      |                     |               |                              |
| Up to 29 years old     | 7,419         | 1,319         | 3,087                      | 1,757                | 2,260               | 562           | 191                          |
| thereof women          | 3,331         | 548           | 1,470                      | 695                  | 922                 | 312           | 79                           |
| 30 to 49 years old     | 31,523        | 5,224         | 15,023                     | 6,938                | 7,625               | 2,972         | 679                          |
| thereof women          | 13,849        | 2,327         | 6,985                      | 2,780                | 2,817               | 1,405         | 315                          |
| 50 or older            | 11,472        | 3,494         | 6,328                      | 3,755                | 869                 | 606           | 175                          |
| thereof women          | 4,386         | 1,433         | 2,429                      | 1,333                | 242                 | 193           | 89                           |
| <b>Average age</b>     | <b>41.3</b>   | <b>44.3</b>   | <b>42.4</b>                | <b>42.9</b>          | <b>36.7</b>         | <b>39.9</b>   | <b>39.3</b>                  |
| <b>Total employees</b> | <b>50,414</b> | <b>10,037</b> | <b>24,438</b>              | <b>12,450</b>        | <b>10,754</b>       | <b>4,140</b>  | <b>1,045</b>                 |
| <b>2017</b>            |               |               |                            |                      |                     |               |                              |
| Up to 29 years old     | 7,676         | 1,438         | 3,272                      | 1,589                | 2,257               | 521           | 188                          |
| thereof women          | 3,512         | 608           | 1,585                      | 634                  | 945                 | 294           | 80                           |
| 30 to 49 years old     | 32,895        | 5,465         | 15,680                     | 5,838                | 8,099               | 2,913         | 738                          |
| thereof women          | 14,540        | 2,423         | 7,287                      | 2,195                | 3,074               | 1,405         | 351                          |
| 50 or older            | 12,370        | 3,617         | 7,028                      | 3,250                | 938                 | 616           | 171                          |
| thereof women          | 4,806         | 1,487         | 2,755                      | 1,069                | 279                 | 197           | 88                           |
| <b>Average age</b>     | <b>41.4</b>   | <b>44.1</b>   | <b>42.5</b>                | <b>42.6</b>          | <b>36.9</b>         | <b>40.3</b>   | <b>39.4</b>                  |
| <b>Total employees</b> | <b>52,941</b> | <b>10,520</b> | <b>25,980</b>              | <b>10,677</b>        | <b>11,294</b>       | <b>4,050</b>  | <b>1,097</b>                 |

1 From 2017 on, the figure only includes the employees of Merck KGaA, Darmstadt, Germany.

## Age of youngest employee

As of Dec. 31

|                                                 | 2014 | 2015 | 2016 <sup>1</sup> | 2017 |
|-------------------------------------------------|------|------|-------------------|------|
| Age of youngest employee, excluding apprentices | 17   | 17   | 17                | 18   |

1 Includes Sigma-Aldrich as of 2016

## Voluntary insurance benefits (voluntarily introduced and (co-) financed)

| As of Dec. 31                                                                    | 2014 <sup>1</sup> | 2015 <sup>1</sup> | 2016            | 2017<br>The Group | 2017<br>thereof<br>Merck KGaA,<br>Darmstadt,<br>Germany |
|----------------------------------------------------------------------------------|-------------------|-------------------|-----------------|-------------------|---------------------------------------------------------|
| % of employees with healthcare benefits <sup>2</sup>                             | –                 | –                 | 68 <sup>3</sup> | 68                | 0                                                       |
| % of employees with Group accident insurance <sup>4</sup>                        | –                 | –                 | 39              | 42                | 1                                                       |
| % of employees with life insurance <sup>5</sup>                                  | –                 | –                 | 57              | 58                | 0                                                       |
| % of employees with disability insurance (short-term and long-term) <sup>6</sup> | –                 | –                 | 32              | 35                | 0                                                       |

1 Since 2016, we've been reporting voluntary insurance benefits that we offer our employees. No such data was tracked for the preceding years.

2 Any spend on voluntarily introduced and (co-) financed healthcare benefits for employees and possibly their dependents. Not taking into consideration any mandatory social security cover (Mostly covered by an insurance policy).

3 Figure retroactively adjusted.

4 Any spend on voluntarily introduced and (co-) financed accident insurance that pays a defined amount in case of death or disability caused by a work-related accident (not taking into consideration any mandatory social security cover, e.g. workman's compensation).

5 Any spend on voluntarily introduced and (co-) financed life insurance cover that pays a defined amount of money in case of natural death (not accidental).

6 Any spend on voluntarily introduced and (co-) financed insurance cover that disability pays for salary continuation in case of inability to work caused by an insured incident.

All our employees are covered by either statutory or voluntary accident and health insurance. Employees of Merck KGaA, Darmstadt, Germany are covered by statutory insurance as stipulated by the regulations in force in Germany.

We offer a company pension in numerous countries along with various programs for supplemental company pensions and survivor's benefits.

The global benefits listed in the table above are designed to provide additional security to our workforce and their families and to improve their quality of life. Benefits represent voluntarily employer-initiated as well as employer-financed assistance to our workforce in addition to the regular compensation package.

Our benefits offer meaningful choices, where possible, to support a diverse workforce and are sensitive to the needs and customs of the employees who use them, regardless of country, age, family status, interests, or values.

## Long-term pension obligations and post-employment benefits

| € million                                                      | 2014  | 2015 <sup>1</sup> | 2016  | 2017  |
|----------------------------------------------------------------|-------|-------------------|-------|-------|
| Present value of all defined benefit obligations as of Dec. 31 | 3,813 | 4,153             | 4,698 | 4,707 |
| Pension expenses                                               | 157   | 210               | 226   | 304   |

1 Includes Sigma-Aldrich as of 2015

Depending on the legal, economic and fiscal circumstances prevailing in each country, different retirement benefit systems are provided for the employees of the Group. Generally, these systems are based on the years of service and salaries of the employees. Pension obligations of the Group include both defined benefit and defined contribution plans and comprise both obligations from current pensions and accrued benefits for pensions payable in the future. In the Group, defined benefit plans are funded and unfunded (see our Annual Report 2017, Note on Provisions for pensions and other post-employment benefits).

### Flexible working hours in Germany

| As of Dec. 31                                       | 2014 | 2015 | 2016 <sup>1</sup> | 2017 <sup>2</sup> |
|-----------------------------------------------------|------|------|-------------------|-------------------|
| % of employees utilizing the "mywork" working model | 31   | 35   | 36                | 40                |

1 Includes Sigma-Aldrich as of 2016

2 Essentially reflects the figures of Merck KGaA, Darmstadt, Germany.

In coordination with their teams and supervisors, employees taking advantage of the working model "mywork" can choose when and where they work.

### Parental leave in Germany

| As of Dec. 31                                                                                   | 2014 <sup>1</sup> | 2015 <sup>1</sup> | 2016 <sup>1</sup> | 2017 <sup>2</sup> |
|-------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| Number of employees with a right to parental leave                                              | 331               | 317               | 359               | 353               |
| thereof women (recorded via maternity leave in the respective year)                             | 165               | 149               | 191               | 151               |
| thereof men (recorded via special paternity leave in the respective year)                       | 166               | 168               | 168               | 202               |
| Number of employees who took parental leave <sup>3</sup>                                        | 507               | 485               | 480               | 352               |
| thereof women                                                                                   | 349               | 301               | 303               | 150               |
| thereof men                                                                                     | 158               | 184               | 177               | 202               |
| Number of employees on parental leave who worked part time during their leave                   | 99                | 102               | 102               | 49                |
| thereof women                                                                                   | 94                | 99                | 95                | 47                |
| thereof men                                                                                     | 5                 | 3                 | 7                 | 2                 |
| Number of employees who returned from parental leave                                            | 187               | 183               | 174               | 312               |
| thereof women                                                                                   | 83                | 51                | 62                | 143               |
| thereof men                                                                                     | 104               | 132               | 112               | 169               |
| Return to work rate (%)                                                                         | 36.9              | 37.7              | 36.3              | 88.6              |
| thereof women                                                                                   | 23.8              | 16.9              | 20.5              | 95.3              |
| thereof men                                                                                     | 65.8              | 71.7              | 63.3              | 83.7              |
| Number of employees still working for the Group one year after their return from parental leave | 137               | 184               | 190               | _ <sup>4</sup>    |
| thereof women                                                                                   | 35                | 55                | 73                | _ <sup>4</sup>    |
| thereof men                                                                                     | 102               | 129               | 117               | _ <sup>4</sup>    |
| Retention rate (%)                                                                              | 90.7              | 96.8              | 95.6              | _ <sup>4</sup>    |
| thereof women                                                                                   | 58.3              | 98.2              | 93.8              | _ <sup>4</sup>    |
| thereof men                                                                                     | 112.1             | 96.3              | 96.8              | _ <sup>4</sup>    |

1 Figures only pertain to the Darmstadt and Gernsheim sites in Germany (which accounted for around 20 % of the employees of the Group in 2017). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year, but who had not returned by Dec. 31.

2 Figures only pertain to Merck KGaA, Darmstadt, Germany (which accounted for around 20 % of the employees of the Group in 2017). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year, but who had not returned by Dec. 31.

3 Since parental leave can be taken for a period ranging from one month to three years, it is possible for employees to be recorded across a period of up to four calendar years. This explains why the number of employees on parental leave exceeds the number of employees who have a right to it.

4 Figure will be available on Dec. 31, 2018.

### Employees with disabilities<sup>1</sup> (%)

| As of Dec. 31                            | 2014 | 2015 | 2016 | 2017 |
|------------------------------------------|------|------|------|------|
| Employees with disabilities <sup>1</sup> | 4.7  | 4.7  | 4.5  | 4.3  |

1 Only pertains to Merck KGaA, Darmstadt, Germany (which accounted for around 20% of the employees of the Group in 2017, calculations based on the German Social Code IX - SGB IX).

### Apprentices

| As of Dec. 31         | 2014 <sup>1</sup> | 2015 <sup>2</sup> | 2016 <sup>3</sup> | 2017 <sup>3</sup> |
|-----------------------|-------------------|-------------------|-------------------|-------------------|
| Number of apprentices | 498               | 506               | 576               | 588               |
| % of apprentices      | 5.4               | 5.3               | 4.6               | 4.4               |

1 Only pertains to Merck KGaA, Darmstadt, Germany sites in Darmstadt, Gernsheim and Grafing, Germany (which accounted for roughly 24% of the employees of the Group in 2014).

2 Only pertains to Merck KGaA, Darmstadt, Germany (roughly 19% of the total employee headcount of the Group in 2015).

3 Only pertains to sites in Germany (approximately 25% of the Group's total workforce in 2016 and 2017). Essentially reflects the figures of Merck KGaA, Darmstadt, Germany.

## Environment

### Spending on environmental protection, safety and health

| € million | 2014 | 2015 | 2016 <sup>1</sup> | 2017 |
|-----------|------|------|-------------------|------|
| Spending  | 145  | 148  | 189               | 200  |

1 Includes Sigma-Aldrich as of 2016

These figures include both investments in as well as internal and external spending on waste and wastewater management, water, occupational safety, fire protection, noise reduction, air pollution prevention, decontamination, preservation of nature and the landscape, climate impact mitigation, and energy efficiency. We do not further break down our spending on environmental protection by type.

### Total greenhouse gas emissions (Scope 1 and 2 of the GHG Protocol)<sup>1</sup>

| metric kilotons                                     | 2006 <sup>2</sup> | 2014       | 2015       | 2016       | 2017       |
|-----------------------------------------------------|-------------------|------------|------------|------------|------------|
| <b>Total CO<sub>2</sub>eq<sup>3</sup> emissions</b> | <b>793</b>        | <b>731</b> | <b>726</b> | <b>711</b> | <b>731</b> |
| Thereof                                             |                   |            |            |            |            |
| direct CO <sub>2</sub> eq emissions                 | 379               | 390        | 393        | 387        | 374        |
| indirect CO <sub>2</sub> eq emissions               | 414               | 341        | 333        | 324        | 357        |
| <b>Biogenic CO<sub>2</sub> emissions</b>            | <b>6</b>          | <b>11</b>  | <b>54</b>  | <b>56</b>  | <b>38</b>  |

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the greenhouse gas emissions have been calculated based on the current corporate structure of the reporting year and retroactively adjusted for acquisitions (e.g. Sigma-Aldrich in 2015) or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Baseline for our emission targets is 2006.

3 eq = equivalent

Our response to the Carbon Disclosure Project contains a detailed description of our calculation methods.

We have included the following gases in our calculation of direct and indirect CO<sub>2</sub>eq emissions:

- Direct CO<sub>2</sub> emissions: CO<sub>2</sub>, HFCs, PFCs; CH<sub>4</sub>/N<sub>2</sub>O negligible; SF<sub>6</sub>/NF<sub>3</sub> not available.
- Indirect CO<sub>2</sub> emissions: CO<sub>2</sub>.

In 2017, we emitted 0.048 kg of CO<sub>2</sub>eq per euro of net sales.

## Other relevant indirect greenhouse gas emissions (Scope 3 of the GHG Protocol)

|                                                                                            | 2014 <sup>1</sup> | 2015 <sup>1</sup> | 2016 <sup>1,2</sup> | 2017              |
|--------------------------------------------------------------------------------------------|-------------------|-------------------|---------------------|-------------------|
| <b>Total gross other indirect emissions (metric kilotons CO<sub>2</sub>eq<sup>3</sup>)</b> | <b>319</b>        | <b>349</b>        | <b>426</b>          | <b>353</b>        |
| Fuel- and energy-related emissions, not included in Scope 1 or 2 (category 3)              | 97                | 95                | 127                 | 118               |
| Waste generated in operations (category 5)                                                 | 96                | 123               | 127                 | 68                |
| Business travel - air travel (category 6)                                                  | 74                | 79                | 103 <sup>4</sup>    | 98                |
| Business travel - rail travel (category 6)                                                 | 0.02              | 0.02              | 0.02                | 0.02 <sup>5</sup> |
| Business travel - rental car travel (category 6)                                           | 1.2               | 1.1               | 0.6                 | 0.6               |
| Employee commuting (category 7)                                                            | 51                | 51                | 68                  | 68                |
| Upstream leased assets (category 8)                                                        | 0                 | 0 <sup>6</sup>    | 0 <sup>6</sup>      | 0 <sup>6</sup>    |
| Processing of sold products (category 10)                                                  | 0                 | 0 <sup>7</sup>    | 0 <sup>7</sup>      | 0 <sup>7</sup>    |
| Downstream leased assets (category 13)                                                     | 0                 | 0                 | 0                   | 0                 |
| Franchises (category 14)                                                                   | 0                 | 0                 | 0                   | 0                 |

1 Because of the characteristics of the Scope 3 emissions data we do not correct these data subsequently.

2 Includes Sigma-Aldrich as of 2016

3 eq = equivalent

4 This figure covers roughly 80% - 85% of the employees of the Group because the data for the employees of Sigma-Aldrich, acquired in November 2015, are only partially available.

5 German Railway

6 Already covered under Scope 1 and 2 emissions

7 The Group produces a huge variety of intermediate products for various purposes. Due to their many applications and our customer structure, the associated GHG emissions cannot be tracked in a reasonable fashion.

No data is available for Scope 3 categories not listed above. Their relevance to the Group is assessed in the Scope 3 document.

Biogenic emissions (Scope 3), if present, are not being recorded.

## Emissions of ozone-depleting substances

| metric tons                                   | 2014 | 2015 | 2016 | 2017 |
|-----------------------------------------------|------|------|------|------|
| Total emissions of ozone-depleting substances | 2.0  | 2.5  | 2.2  | 2.1  |
| CFC-11eq <sup>1</sup>                         | 0.1  | 0.1  | 0.1  | 0.1  |

1 CFC-11eq is a unit of measure used to compare the potential of various substances to deplete the ozone. Reference figure 1 indicates the potential of CFC-11 to cause the depletion of the ozone layer.

Substances included: R-12, R-22, R-141b, R-402a, R-409a, R-401a.

Source for the emission factors: Montreal Protocol.

## Other air emissions

| metric kilotons                  | 2014 | 2015 | 2016 <sup>1</sup> | 2017 |
|----------------------------------|------|------|-------------------|------|
| Volatile organic compounds (VOC) | 0.3  | 0.3  | 0.3               | 0.3  |
| Nitrogen oxide                   | 0.2  | 0.3  | 0.2               | 0.2  |
| Sulfur dioxide                   | 0.02 | 0.05 | 0.05              | 0.03 |
| Dust                             | 0.02 | 0.06 | 0.02              | 0.04 |

1 Includes Sigma-Aldrich as of 2016

The VOC, nitrogen oxide, sulfur dioxide, and dust emissions reported here are attributable to production activities as well as energy generation. These figures do not include emissions from vehicles. Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

#### Transport of finished goods, by means of transportation

|            | 2014 <sup>1</sup> | 2015 <sup>1</sup> | 2016 <sup>2</sup> | 2017 |
|------------|-------------------|-------------------|-------------------|------|
| % Truck    | 56                | 53                | 71                | 73   |
| % Boat     | 38                | 41                | 18                | 15   |
| % Airplane | 6                 | 6                 | 11                | 12   |

1 The figures until 2015 pertain to goods shipped by our Darmstadt, Gernsheim and Hohenbrunn sites in Germany (excluding Sigma-Aldrich).

2 From 2016 on, the figures contain the volumes of the biggest global distribution centers of our Healthcare, Life Science and Performance Materials business sectors. These figures pertain to the total weight of transported products and indicate the primary means of transport.

In shipping finished goods from our production sites to the local warehouses of our subsidiaries, we have been working to reduce the use of air shipping in favor of sea freight. This change aims to both reduce costs as well as lower transport-related CO<sub>2</sub> emissions.

## Energy consumption<sup>1</sup>

| In GWh                                      | 2014         | 2015         | 2016         | 2017         |
|---------------------------------------------|--------------|--------------|--------------|--------------|
| <b>Total energy consumption</b>             | <b>2,162</b> | <b>2,260</b> | <b>2,241</b> | <b>2,270</b> |
| <b>Direct energy consumption</b>            | <b>1,354</b> | <b>1,452</b> | <b>1,445</b> | <b>1,386</b> |
| Natural gas                                 | 1,207        | 1,206        | 1,267        | 1,256        |
| Liquid fossil fuels <sup>2</sup>            | 120          | 111          | 37           | 34           |
| Biomass and self-generated renewable energy | 27           | 135          | 141          | 96           |
| <b>Indirect energy consumption</b>          | <b>808</b>   | <b>808</b>   | <b>796</b>   | <b>884</b>   |
| Electricity                                 | 711          | 712          | 701          | 740          |
| Steam, heat, cold                           | 97           | 96           | 95           | 144          |
| <b>Total energy sold</b>                    | <b>0.6</b>   | <b>0.5</b>   | <b>0.5</b>   | <b>0.3</b>   |
| Electricity                                 | 0.6          | 0.5          | 0.5          | 0.3          |
| Steam, heat, cold                           | 0            | 0            | 0            | 0            |

  

| In TJ                                       | 2014         | 2015         | 2016         | 2017         |
|---------------------------------------------|--------------|--------------|--------------|--------------|
| <b>Total energy consumption</b>             | <b>7,783</b> | <b>8,137</b> | <b>8,068</b> | <b>8,172</b> |
| <b>Direct energy consumption</b>            | <b>4,874</b> | <b>5,228</b> | <b>5,202</b> | <b>4,990</b> |
| Natural gas                                 | 4,345        | 4,342        | 4,561        | 4,522        |
| Liquid fossil fuels <sup>2</sup>            | 432          | 400          | 133          | 122          |
| Biomass and self-generated renewable energy | 97           | 486          | 508          | 346          |
| <b>Indirect energy consumption</b>          | <b>2,909</b> | <b>2,909</b> | <b>2,866</b> | <b>3,182</b> |
| Electricity                                 | 2,560        | 2,563        | 2,524        | 2,664        |
| Steam, heat, cold                           | 349          | 346          | 342          | 518          |
| <b>Total energy sold</b>                    | <b>2.2</b>   | <b>1.8</b>   | <b>1.8</b>   | <b>1.1</b>   |
| Electricity                                 | 2.2          | 1.8          | 1.8          | 1.1          |
| Steam, heat, cold                           | 0.0          | 0.0          | 0.0          | 0.0          |

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the energy consumption has been calculated based on the current corporate structure of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

2 Light and heavy fuel oil, liquefied petroleum gas (LPG), diesel and gasoline

At our sites in Billerica (MA, USA), Bedford (MA, USA), Molsheim (France), Tel Aviv (Israel), Rome (Italy), Guatemala City (Guatemala), Shizuoka-ken (Japan), and Shanghai (China), we use photovoltaics to produce power.

We currently only record purchased secondary energy – this is primarily electricity and, to a lesser extent, heat/steam/cold. Details on the local energy mix, including the respective percentage of primary energy, renewable energy, etc. are not available. Data on local energy efficiency in electricity or heat generation are not available either. Our production sites are located in countries with a widely varying energy mix.

Our Darmstadt and Gernsheim sites in Germany consume the most energy, representing 28% of our Group-wide total. At these sites, fossil energy (coal, gas, etc.) accounts for approx. 53.7%, nuclear energy approx. 14.3% and renewable energies approx. 32% of the energy mix. Renewable energies account for a higher share of electricity generation at production sites in Switzerland, with nuclear energy taking the lead in France. Based on an estimated global energy efficiency of 37% for the conversion and distribution of generated electricity, this results in a primary energy consumption of 2,000 GWh for 2017. Based on an estimated global energy efficiency of 85% for heat/steam/cold, this results in a primary energy consumption of 170 GWh for 2017. This yields a total primary energy consumption of 2,170 GWh for 2017. (The calculation is based on factors stated in the "Manual for energy management in practice - Systematically reducing energy costs" published by DENA, 12/2012.)

In 2017, the Group's energy intensity relative to net sales totaled 0.150 kWh/€.

### Water consumption

| millions of m <sup>3</sup>            | 2014        | 2015 <sup>1</sup>       | 2016                    | 2017        |
|---------------------------------------|-------------|-------------------------|-------------------------|-------------|
| <b>Total water consumption</b>        | <b>11.1</b> | <b>13.7<sup>2</sup></b> | <b>13.8<sup>2</sup></b> | <b>14.0</b> |
| Surface water (rivers, lakes)         | 1.2         | 1.8 <sup>2</sup>        | 1.8 <sup>2</sup>        | 1.8         |
| Groundwater                           | 6.3         | 7.1 <sup>2</sup>        | 7.2                     | 7.3         |
| Drinking water (from local suppliers) | 3.6         | 4.8 <sup>2</sup>        | 4.8 <sup>2</sup>        | 4.9         |
| Rain water and other sources          | 0.01        | 0.01                    | 0.01                    | 0.01        |

1 Includes Sigma-Aldrich as of 2015

2 Figure retroactively adjusted.

These figures do not include the ground water that we use for safety measures at our Gernsheim site in Germany. Here, the water is fed back directly into natural circulation.

### Water reused

| millions of m <sup>3</sup> | 2014 | 2015 <sup>1</sup> | 2016 | 2017 |
|----------------------------|------|-------------------|------|------|
| Water reused               | 16.0 | 23.0              | 22.7 | 22.4 |

1 Includes Sigma-Aldrich as of 2015

The increase in reused water in 2015 is attributable to the recirculating cooling system that went online at our facility in Darmstadt, Germany. This system provides recirculating cooling water to both our new co-generation unit as well as our new cold and compressed air generator. The recirculating cooling system largely accounts for the amount of reused water as it allows the water to be re-utilized multiple times. The volume of reused water is thus greater than the total volume of consumed water.

### Wastewater volume and quality

|                                                            | 2014        | 2015 <sup>1</sup> | 2016             | 2017        |
|------------------------------------------------------------|-------------|-------------------|------------------|-------------|
| <b>Total wastewater volume (millions of m<sup>3</sup>)</b> | <b>10.1</b> | <b>11.8</b>       | <b>12.1</b>      | <b>12.3</b> |
| Chemical oxygen demand (metric tons of O <sub>3</sub> )    | 1,319       | 1,933             | 1,535            | 1,654       |
| Phosphorous (metric tons)                                  | 10          | 10                | 12               | 8           |
| Nitrogen (metric tons)                                     | 81          | 487 <sup>2</sup>  | 379 <sup>2</sup> | 254         |
| Zinc (kg)                                                  | 410         | 491 <sup>2</sup>  | 448 <sup>2</sup> | 351         |
| Chromium (kg)                                              | 36          | 42                | 34               | 34          |
| Copper (kg)                                                | 34          | 78 <sup>2</sup>   | 48 <sup>2</sup>  | 61          |
| Nickel (kg)                                                | 128         | 127 <sup>2</sup>  | 124              | 138         |
| Lead (kg)                                                  | 55          | 54                | 56               | 63          |
| Cadmium (kg)                                               | 10          | 13                | 11               | 12          |
| Mercury (kg)                                               | 1           | 2                 | 2                | 1           |
| Arsenic (kg)                                               | 4           | 5                 | 4                | 3           |

1 Includes Sigma-Aldrich as of 2015

2 Figure retroactively adjusted.

The wastewater volume includes indirect discharge into both public and Group-owned wastewater treatment plants, as well as direct discharge (such as rainwater and cooling water).

The wastewater treatment plant at our Gernsheim, Germany site also treats wastewater from the neighboring municipality

of Biebesheim. The communal wastewater from Biebesheim is included in the wastewater volume as well as in the emissions stated in the table.

Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

### Hazardous and non-hazardous waste

| metric kilotons                           | 2014       | 2015 <sup>1</sup>      | 2016                   | 2017       |
|-------------------------------------------|------------|------------------------|------------------------|------------|
| <b>Total waste</b>                        | <b>228</b> | <b>320<sup>2</sup></b> | <b>252<sup>2</sup></b> | <b>252</b> |
| Hazardous waste disposed <sup>3</sup>     | 53         | 55                     | 47 <sup>2</sup>        | 43         |
| Non-hazardous waste disposed <sup>3</sup> | 55         | 35                     | 38 <sup>2</sup>        | 34         |
| Hazardous waste recycled <sup>4</sup>     | 49         | 73                     | 78 <sup>2</sup>        | 69         |
| Non-hazardous waste recycled <sup>4</sup> | 71         | 157 <sup>2</sup>       | 89 <sup>2</sup>        | 106        |

1 Includes Sigma-Aldrich as of 2015

2 Figure retroactively adjusted.

3 Disposed = incineration (without energy recovery) and landfill

4 Recycled = incineration (with energy recovery) and material recycling

### Exported/Imported hazardous waste

| metric kilotons       | 2014  | 2015 <sup>1</sup> | 2016  | 2017  |
|-----------------------|-------|-------------------|-------|-------|
| Exported <sup>2</sup> | 9.6   | 5.1               | 4.6   | 4.9   |
| Imported <sup>3</sup> | 0.003 | 0.010             | 0.010 | 0.005 |

1 Includes Sigma-Aldrich as of 2015

2 Disposal within the EU and the United States.

3 As part of the return system for our cell tests, these kits are brought to our Gernsheim site in Germany for proper disposal.

In 2017, less than 2% of hazardous waste was shipped internationally.

### Waste by disposal method

|                                         | 2014       | 2015 <sup>1</sup>      | 2016                   | 2017       |
|-----------------------------------------|------------|------------------------|------------------------|------------|
| <b>Total waste (metric kilotons)</b>    | <b>228</b> | <b>320<sup>2</sup></b> | <b>252<sup>2</sup></b> | <b>252</b> |
| <b>Disposed waste (metric kilotons)</b> | <b>108</b> | <b>90</b>              | <b>85<sup>2</sup></b>  | <b>77</b>  |
| Landfilled waste (metric kilotons)      | 37         | 16                     | 15 <sup>2</sup>        | 13         |
| Incinerated waste (metric kilotons)     | 71         | 74                     | 70 <sup>2</sup>        | 64         |
| <b>Recycled waste (metric kilotons)</b> | <b>120</b> | <b>230<sup>2</sup></b> | <b>167<sup>2</sup></b> | <b>175</b> |
| Material recycling (metric kilotons)    | 93         | 198 <sup>2</sup>       | 135 <sup>2</sup>       | 145        |
| Waste-to-energy (metric kilotons)       | 27         | 32                     | 32 <sup>2</sup>        | 30         |
| <b>Recycling rate (%)</b>               | <b>53</b>  | <b>72</b>              | <b>66<sup>2</sup></b>  | <b>69</b>  |

1 Includes Sigma-Aldrich as of 2015

2 Figure retroactively adjusted.

As in previous years, the total waste generated continues to be heavily influenced by the waste from construction and remodeling activities. Construction, excavation and demolition waste accounted for 37% of our waste in 2017. Around 74 metric kilotons of construction, excavation and demolition waste was recycled.

## Significant spills

|                                    | 2014 | 2015 <sup>1</sup> | 2016 | 2017 |
|------------------------------------|------|-------------------|------|------|
| Total number of significant spills | 0    | 0                 | 0    | 0    |

1 Includes Sigma-Aldrich as of 2015

## community

### Spending on community involvement

| € million      | 2014 | 2015  | 2016 <sup>1,2</sup> | 2017 |
|----------------|------|-------|---------------------|------|
| Total spending | 50.8 | 100.0 | 43.0                | 33.8 |

1 Includes Sigma-Aldrich as of 2016

2 From 2016 on, we are separating spending on patient support programs such as our Erbitux® China Patients Assistance Program from our community involvement figures.

We calculate the value of pharmaceutical product donations according to the WHO Guidelines for Medicine Donations; for other product donations, we apply their fair value.

### Community involvement spending by region<sup>1</sup>

|           | Europe | North America | Asia-Pacific (APAC) | Latin America | Middle East and Africa (MEA) |
|-----------|--------|---------------|---------------------|---------------|------------------------------|
| 2016      |        |               |                     |               |                              |
| € million | 10.1   | 2.3           | 4.4                 | 1.1           | 25.1                         |
| %         | 24     | 5             | 10                  | 3             | 58                           |
| 2017      |        |               |                     |               |                              |
| € million | 8.7    | 2.9           | 3.2                 | 0.5           | 18.5                         |
| %         | 26     | 9             | 9                   | 1             | 55                           |

1 This table presents the regions across the globe in which we support initiatives. For projects that benefit multiple regions, we have calculated the amount per region by dividing the project spending evenly per country.

### Focus of our local community involvement<sup>1</sup>

| %                     | 2014 | 2015 | 2016 <sup>2,3,4</sup> | 2017 |
|-----------------------|------|------|-----------------------|------|
| Health                | 33   | 33   | 35                    | 38   |
| Education and culture | 38   | 33   | 36                    | 43   |
| Environment           | 10   | 7    | 5                     | 4    |
| Disaster relief       | 4    | 6    | 2                     | 2    |
| Other                 | 15   | 21   | 22                    | 13   |

1 Based on number of projects

2 Includes Sigma-Aldrich as of 2016

3 Since 2016, we have integrated our global projects into our community outreach figures, specifically the Global Pharma Health Fund, the Praziquantel Donation Program and the Deutsche Philharmonie sponsored by Merck KGaA, Darmstadt, Germany. This change in approach was due to the increasingly international nature of our efforts. We are spearheading a rising number of global projects that account for a growing percentage of our project portfolio. To ensure maximal accuracy, we are therefore including all international initiatives in our figures as of 2016.

4 From 2016 on, we are separating spending on patient support programs such as our Erbitux® China Patients Assistance Program from our charitable spending figures.

## Motivations for our community involvement<sup>1</sup>

| %                                       | 2014 | 2015 | 2016 <sup>2,3,4</sup> | 2017 |
|-----------------------------------------|------|------|-----------------------|------|
| Charitable activities                   | 9    | 3    | 4                     | 9    |
| Community investment                    | 59   | 92   | 87                    | 84   |
| Commercial initiatives in the community | 32   | 5    | 9                     | 7    |

1 Based on total spending on all projects

2 Including Sigma-Aldrich as of 2016

3 Since 2016, we have been integrating our global projects into our community outreach figures, specifically the Global Pharma Health Fund, the Praziquantel Donation Program and the Deutsche Philharmonie sponsored by Merck KGaA, Darmstadt, Germany. This change in approach was due to the increasingly international nature of our efforts. We are spearheading a rising number of global projects that account for a growing percentage of our project portfolio. To ensure maximal accuracy, we are therefore including all international initiatives in our figures as of 2016.

4 As of 2016, we are separating patient support programs such as our Erbitux<sup>®</sup> China Patients Assistance Program from our charitable spending.

We categorize the motivations for our activities based on the London Benchmarking Group model as well as the guidelines of the Bertelsmann Foundation for corporate social responsibility. Projects that primarily aim to make improvements within the community are classified as community investment.

Initiatives that are predominantly aimed at company-relevant factors such as image or personnel recruitment are classified as commercial initiatives in the community. Charitable activities cover any other projects that benefit a charitable organization, but cannot be listed under either of the other two motivation categories due to missing data or their narrow scope.