

All

Integrated Report  
2017

in

one

The Clariant Integrated Report 2017, available in printed and online format, provides an overview of how Clariant creates value in multiple dimensions.

Clariant no longer publishes a separate Sustainability Report. Sustainability information can be found throughout the Integrated Report and in the online GRI Report.

In-depth information on financial results can be found in the online Financial Report and details on governance and compensation are available in the online Corporate Governance Report and the Compensation Report.



**THE FOLLOWING REPORTS ARE AVAILABLE ONLINE AND AS PDF FOR DOWNLOAD:**

**Integrated  
Report**  
[reports.clariant.com](https://reports.clariant.com)

**Corporate Governance  
Report**  
[reports.clariant.com/  
2017/corporategovernance](https://reports.clariant.com/2017/corporategovernance)

**Compensation  
Report**  
[reports.clariant.com/  
2017/compensation](https://reports.clariant.com/2017/compensation)

**Financial  
Report**  
[reports.clariant.com/  
2017/financialreport](https://reports.clariant.com/2017/financialreport)

**GRI  
Report**  
[reports.clariant.com/  
2017/gri](https://reports.clariant.com/2017/gri)

All in one. With this report, Clariant wants to take you on a journey of numbers. Behind each number there are successes and failures, lessons learned and experiences, accomplishments and impacts. Clariant wants to tell these stories: where the numbers come from, how they connect, and what impact they have.

In this second annual report published in the form of an Integrated Report, Clariant provides an in-depth view of its holistic approach to creating added value for customers, employees, shareholders, and the environment. According to its three brand values – Performance, People, Planet – Clariant takes financial and non-financial aspects of value creation into account. This is why Clariant shares not just financial figures, but also the numbers that represent the various capitals used and affected: financial, intellectual, manufactured, human, relational, and natural. These numbers highlight Clariant’s most precious values, and the stories behind them – all in one.



## Performance

### FINANCIAL CAPITAL in CHF m

	2017	2016
Sales	<b>6 377</b>	5 847
EBITDA before exceptionals	<b>974</b>	887
EBITDA margin before exceptional items (%)	<b>15.3</b>	15.2
EBIT before exceptional items	<b>673</b>	622
Net income	<b>302</b>	263
Basic earnings per share (in CHF)	<b>0.84</b>	0.78
Adjusted earnings per share (in CHF)	<b>1.47</b>	1.12
Operating cash flow	<b>428</b>	646
Investment in property, plant and equipment	<b>248</b>	297
Research & Development expenditures	<b>211</b>	206
Growth through innovation (%) <sup>1</sup>	<b>2.5</b>	1.5
Personnel expenditures <sup>2</sup>	<b>1 516</b>	1 435
Raw material procurement	<b>2 674</b>	2 221
Total assets	<b>8 229</b>	8 365
Equity	<b>2 939</b>	2 546
Equity ratio (%)	<b>35.7</b>	30.4
Net debt	<b>1 539</b>	1 540
Gearing ratio (%)	<b>52</b>	60

<sup>1</sup> Contains the contribution to growth from both Top Line Innovation as well as Life Cycle Innovation. Potential cannibalization of existing sales caused by Life Cycle Innovation in certain cases has not been excluded from calculation

<sup>2</sup> Including own employees and external staff

## People

### HUMAN CAPITAL in FTE (Full Time Equivalents)

	2017	2016
Total staff	<b>18 135</b>	17 442
Employees	<b>10 482</b>	9 881
Of which male	<b>7 264 (69%)</b>	6 734 (68%)
Of which female	<b>3 218 (31%)</b>	3 147 (32%)
Workers	<b>7 653</b>	7 560
Of which male	<b>7 066 (92%)</b>	6 995 (93%)
Of which female	<b>587 (8%)</b>	565 (7%)
Total training hours	<b>192 000</b>	201 884
Training hours (Ø per participant)	<b>20</b>	19
Staff in Research & Development	<b>- 1 100</b>	- 1 100
Lost Time Accident Rate (LTAR: accidents with at least 1 day lost/200 000 work hours)	<b>0.20</b>	0.19

## Planet

### NATURAL CAPITAL

	2017	2016
Total energy consumption (in m kWh)	<b>3 245</b>	2 950
Energy consumption (in kWh/t production)	<b>706</b>	719
Total water consumption (in m m <sup>3</sup> )	<b>49</b>	48
Total waste water generation (in m m <sup>3</sup> )	<b>13</b>	13
Total greenhouse gas emissions (scope 1 & 2 CO <sub>2</sub> equivalents) (in m t)	<b>0.97</b>	0.89
Greenhouse gas emissions (scope 1 & 2 CO <sub>2</sub> equivalents) (in kg/t production)	<b>211</b>	218
Total quantity of waste (in thousand t)	<b>198</b>	147

### INTELLECTUAL CAPITAL

	2017	2016
Patents (year end)	<b>6 600</b>	6 500
Active innovation projects	<b>&gt; 370</b>	320
Of which Class 1 Projects with double-digit million sales potential or of strategic relevance	<b>&gt; 65</b>	60
Scientific collaborations	<b>&gt; 125</b>	125

### MANUFACTURED CAPITAL

	2017	2016
Research & Development Centers	<b>8</b>	8
Technical Centers	<b>&gt; 50</b>	> 50
Production sites	<b>125</b>	120 <sup>1</sup>
Countries with production facilities	<b>39</b>	40
Raw materials procured (in m t)	<b>3.14</b>	2.82
Production (in m t)	<b>4.60</b>	4.09

<sup>1</sup> Restated to show all productions sites instead of production sites in performance reporting scope only

### RELATIONSHIP CAPITAL

	2017	2016
Employee participation in engagement survey	<b>n.a.<sup>1</sup></b>	11 000
Raw material suppliers	<b>7 000</b>	5 250
Raw material supply base by spend covered by sustainability evaluations (%)	<b>65</b>	63
Survey responses from customer contacts obtained	<b>n.a.<sup>1</sup></b>	2 693
Customers who want to continue doing business with Clariant (%)	<b>n.a.<sup>1</sup></b>	91

<sup>1</sup> Surveys are conducted every two years

## TRANSFORMING JOURNEYS

**32 000**

Clariant has received and processed around 32 000 job applications via its new digital HR platform. → **PAGE 026**

## STRATEGIC DIRECTION

**131**

The materiality matrix was reviewed by 131 external stakeholders. → **PAGE 014**

## PROMISING RESULTS

**>300**

More than 300 genes were screened in the labs of the Active Ingredients unit. → **PAGE 078**

## GROWING AMBITIONS

**400**

The total size of Clariant's new greenhouse is 400 sqm. → **PAGE 046**

## BUILDING CONNECTIONS

**3**

A colleague from India stayed for on-the-job training for three months in the U.S. → **PAGE 064**

## BOOSTING INNOVATIONS

**125**

Clariant is part of more than 125 scientific and research partnerships all over the world. → **PAGE 090**

## DELIVERING SOLUTIONS

**17**

17 Innovation Black Belts manage the Class 1 innovation projects. → **PAGE 102**

## EMPOWERING CHANGE

**7**

Seven years ago, the last so-called lost-time accident happened at the Tangerang site. → **PAGE 150**

## DRIVING SUSTAINABILITY

**99.9**

EnviCat® VOC catalysts will exceed environmental regulations by reaching conversion rates of 99.9%. → **PAGE 162**

## ENSURING TRUST

**50**

The WHO estimates that 50% of all medicines available from the internet are fakes. → **PAGE 112**

## MARKETING ADVANCES

**12.3**

Marketing Excellence projects led to an added contribution margin of CHF 12.3 million. → **PAGE 056**



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# Let's Talk Numbers

Numbers tell a story. In this case, it's a story of progress and performance. In 2017 Clariant continued to implement its ambitious strategy for growth. Successfully, as the numbers in this report show. Behind each and every number, however, there are people and even more stories to be told.

# 18 135

**At the end** of 2017, Clariant had a total staff of 18135, corresponding to an increase of 4% compared to 2016.

→ PAGE 138

# 974

**The EBITDA** before exceptional items in absolute value was CHF 974 million, which corresponds to an increase of 10% in Swiss francs versus the previous year.

→ PAGE 120

# 6 600

**By the end** of 2017, Clariant held 6600 patents.

→ PAGE 132

# 2.5

**Clariant achieved** 2.5% growth through innovation in 2017.<sup>1</sup>

→ PAGE 132

<sup>1</sup> Contains the contribution to growth from both Top Line Innovation as well as Life Cycle Innovation. Potential cannibalization of existing sales caused by Life Cycle Innovation in certain cases has not been excluded from calculation

# 3.2

**Thanks to** its dedicated action to reduce negative climate impacts, Clariant reduced its greenhouse gas emissions by 3.2% in 2017.

→ PAGE 156

# 6 377

**Clariant reported** group sales of CHF 6 377 million in 2017 which reflects 9% growth in local currency and in Swiss francs.

→ PAGE 118

# 515

**Within its** 34 active Marketing Excellence projects, Clariant conducted 515 customer interviews in 2017.

→ PAGE 144

# 1983

**In 2017**, Clariant hired 1983 new employees (571 women and 1412 men) to support its profitable growth strategy.

→ PAGE 139

# 18

**Clariant awarded** 18 products with the EcoTain® label in 2017, underscoring its strong commitment to sustainability.

→ PAGE 133

# 0.2

**Clariant managed** to stabilize the lost time accident rate (LTAR) at a low level of 0.2 days lost per 200 000 hours of work, as compared to 0.19 days lost in 2016.

→ PAGE 142

# »We Continue to Follow our Value Creation Strategy«

**A turbulent 2017 saw Clariant announce plans for a merger only to later abandon them. CEO Hariolf Kottmann and the Chairman of the Board of Directors Rudolf Wehrli discuss what led to these decisions and how Clariant nevertheless stayed the course for growth.**

**Mr. Wehrli, Mr. Kottmann, how did you experience this rather turbulent year?**

**HARIOLF KOTTMANN** At the beginning of 2017, we found ourselves in a challenging situation. A weak oil price and the volatile economic environment were impacting our overall business performance. However, in the course of the year we managed to turn the tables. In the end we actually achieved our 2017 objectives in terms of growth and profitability: we delivered 9% sales growth and an improvement of the absolute EBITDA before exceptional items of 10% to CHF 974 million. Cash flow generation, however, was still lagging behind our own ambition and remains a challenge.

This was, of course, not the only challenge we had to face. Ongoing consolidation in the chemical industry has led to a steady decrease in the number of companies that are of similar size as Clariant. Seeing that companies of this kind are either bought by competitors or deliberately split up in order to sell their individual businesses, we decided to act.

**RUDOLF WEHRLI** Our goal has always been to lead our company into the future without losing its brand, culture, portfolio, and established management team. The best way to achieve this goal is to gain a certain size – size matters in our industry. However, we were neither able nor willing to incur massive debts to make a major acquisition. Therefore, a merger of equals appeared to be the best available option at the time.

**Clariant's intention was to merge with the American chemical company, Huntsman. However, as we all know, your plans failed. How could that happen?**

**RUDOLF WEHRLI** The continued accumulation of Clariant shares by activist investor White Tale Holdings and its opposition to the transaction, caused an increasing uncertainty in the market. Given the fact that less than 60% of the votes are present in an average Annual General Meeting, it became more and more difficult to secure the two-thirds majority shareholder approval that would have been required to approve the transaction under Swiss law. To avoid disruption and further uncertainty, Clariant and Huntsman jointly decided to terminate the merger agreement. By this, we avoided a significant break-up fee and did what we always do: we acted in the best interest of all our shareholders.

**Does that mean a minority shareholder single-handedly decided the fate of the company?**

**HARIOLF KOTTMANN** No, White Tale was our biggest shareholder, but still a minority shareholder; the company was and is run by the Board of Directors and the Executive Committee. We acted decisively when planning the merger with Huntsman, and we acted just as decisively when we abandoned it due to the changed situation. At no time did we stray off our strategic path of value creation. We had several meetings with White Tale with the intention to share our corporate strategy and our vision for the future of Clariant and to listen to their plans. White Tale, however, was not interested in our strategy and did not reveal any plans. Instead, they made several requests, from immediately selling Plastics & Coatings to hiring an additional investment bank and giving them three seats on our Board of Directors. We saw their demands as aimed at one goal only: to break up the company and to



# 974

**Absolute EBITDA** before exceptional items increased by 10% to CHF 974 million.



#### **Hariolf Kottmann**

Born in 1955

Chief Executive Officer (CEO) since 1 October 2008

Member of the Board of Directors since 10 April 2008

maximize their own investment. To prevent that from happening, we had to come up with other ideas to create value as it was expected by the financial market.

#### **And the idea you came up with was to find a white knight to get rid of the activist investor?**

**HARIOLF KOTTMANN** We have always said that one of Clariant's strategic options was to get another anchor investor. Clariant has been in contact with SABIC for many years. SABIC is not only an important customer, but also a joint venture partner for Clariant. Since the takeover of Süd-Chemie in 2011, we have been closely linked. I already had extensive strategic discussions with SABIC from 2012 through 2014. Due to a change in management, however, they were put on hold for a while. But since then we have been in regular contact again. This dialogue was intensified once we termi-

nated the planned merger with Huntsman. There were many informal discussions and meetings, for example during the GPCA Forum in Dubai at the end of November 2017, to which SABIC's CEO Yousef Abdullah Al-Benyan had invited me as keynote speaker. We were, however, not involved in the acquisition of the shares by SABIC from White Tale. We were simply informed in advance as is usual in such cases. But we opened the door for SABIC early on.

#### **What are SABIC's plans? Is the Saudi Arabian company interested in selling parts of the Clariant businesses, too?**

**RUDOLF WEHRLI** We are in intensive talks with our new major shareholder SABIC to identify opportunities to accelerate the implementation of our growth strategy. It's too early to speculate about specific steps. What is

certain is that we share a common understanding of our business. SABIC is not a financial investor; it's a strategic investor. If we were ever to consider divesting from individual parts of our business – such as our strategic currency Plastics & Coatings – we would only do so when we know exactly how to invest the returns.

**HARIOLF KOTTMANN** Absolutely. SABIC and Clariant follow much the same principles. SABIC is a successful, respected and very professionally managed company that places high demands on excellence and profitability. We have a professional and trusting relationship with our new strategic investor and we are confident that SABIC's support will enable us to implement our strategy even faster. Our relationship and our discussions so far are very promising. Nothing changes in our general goals. We want to become even more profitable. We want to become even more innovative. And we want to grow even faster. Clariant today is a strong, innova-

tive and valuable company. That is the result of prudent strategy and hard work. And for that I want to expressively thank all our employees! We have great opportunities to independently and actively develop the company with SABIC and to create sustainable value for all our stakeholders. We want to continue on this path and shape the future of Clariant.

**That sounds like a long-term plan for value creation. What exactly does value creation mean for Clariant?**

**RUDOLF WEHRLI** Most importantly and as before, we want to create value for all our stakeholders – customers, employees, society and of course shareholders. We want to provide jobs for highly motivated and qualified people. We want to offer innovative and sustainable solutions for our customers that help them to master the most urgent challenges of modern society. And we

**Rudolf Wehrli**

Born in 1949  
Chairman of the Board of  
Directors since 27 March 2012



**The Board of Directors** proposes a dividend of CHF 0.50 to the Annual General Meeting.

want to help our shareholders increase their return on capital. Since 2011, Clariant has increased its dividend year by year. Once again this year, the Board of Directors will propose an increased dividend of CHF 0.50 to the Annual General Meeting, as the company's performance has improved, despite the difficult economic environment.

**HAROLF KOTTMANN** One example for value creation is our investment in biotechnology which has resulted in a first wave of commercial projects. We have signed a license agreement for sunliquid® and also announced the construction of a bio-ethanol plant in Romania. Another example is the fact that we increased our top-line growth through successful innovations in our various businesses. Just think about GlucoTain®, an innovative and sustainable range of sugar-based surfactants for the cosmetics industry. This performance has garnered recognition and praise from many of our customers and partners. Looking at the financial markets, Clariant was also included in the SPI™ Select Dividend 20 Index, in the MSCI Equity Switzerland Index, and again we achieved best-in-class rankings in the Dow Jones Sustainability Index.

**Speaking of Sustainability, why is there no longer a separate Sustainability Report? Does this mean that the topic is becoming less important to Clariant?**

**RUDOLF WEHRLI** No, quite the opposite. We have published our first Integrated Report for 2016. Last year, we further expanded integrated reporting in the company. We conducted an extensive review of our materiality matrix. Specifically, this means that we were asking a variety of internal and external stakeholders for their opinions on the topics that are critical to Clariant's business success. The result of this analysis can be found in this report. Our long-term business strategy is also focused on these key topics, including innovation, growth, profitability, and sustainable chemistry. We also show how we manage these topics. If you take integrated reporting seriously, a separate sustainability report becomes obsolete. When a company adopts an integrated approach, sustainability is embedded. That's when mutual impacts between financial and non-financial indicators are considered and used to steer the business and review its performance.

**HAROLF KOTTMANN** Sustainability is part of our corporate »DNA« and determines our actions on many levels. We have signed the UN Global Compact and the Responsible Care™ Charter – both are key initiatives in the field of sustainability. In doing so, we set the cornerstones for all our operations and committed ourselves to unconditional compliance with these principles. Additionally, we are steadily evaluating the impact

and the contributions of our product portfolio in terms of society and the environment. This is possible due to a comprehensive sustainability screening under our Portfolio Value Program. Products with an outstanding sustainability profile that don't compromise on product performance are labeled EcoTain®. As of now, 169 products have been awarded EcoTain®. They offer excellent value to customers. Given the clout of the EcoTain® brand, some companies use the label on their products to communicate their own sustainability efforts to their customers.

**Last year was characterized by a lot of change. Will this continue in 2018?**

**RUDOLF WEHRLI** A company like Clariant has to be in change constantly. This is necessary to anticipate, to adapt to and to actively shape a perpetually changing business environment. In other words, if we lacked the willingness to change we would cede control to others. Change is a good thing. It drives innovation and competitiveness.

**HAROLF KOTTMANN** Our strategy addresses exactly that. The Clariant management will continue to steer the company with a steady hand to the top tier of the chemical industry. We will achieve this by leveraging our integrated approach to value creation into further increasing our profitability and delivering a return on invested capital well above the average in our peer group.

# 169

**For their outstanding** sustainability profiles, 169 products have been awarded EcoTain®.

**2017 IN NUMBERS**

For Clariant numbers go beyond profit. The numbers in this chapter reflect a clear vision and a set of values too. Defining specific goals helps Clariant to further improve every aspect of its operations, from driving sustainable development to striving for operational excellence and fostering talent.

# The Founda- tion of Success

# 10

**The Board of Directors** was comprised of 10 members, of which three are women.

# 131

**A global survey** with 131 external stakeholders was designed to access Clariant's materiality matrix.

# 15.3

**The EBITDA margin** before exceptional items was 15.3% in 2017.

# 13

**Sales growth** in China increased to 13%.

# 85

**In 2017**, 85% of the Group Management positions were filled with internal talents.

# 162

**The net benefit** achieved by Clariant Excellence projects in 2017 amounts to CHF 162 million.

# Vision, Mission, and Values

**In order to consistently add value for customers, employees, shareholders, and the environment, Clariant relies on its guiding vision, a well-defined mission, and a culture that encourages every employee to explore new ways to create value for all stakeholders.**

## 1. A focused vision and mission

Clariant aspires to be the globally leading company for specialty chemicals, and to stand out through above-average value creation for all stakeholders. To bring this vision to fruition, Clariant builds and maintains leading positions in its businesses and has adopted functional excellence as part of its corporate culture. Clariant's mission is to create value by appreciating the needs of:

- customers – by providing competitive and innovative solutions
- employees – by adhering to corporate values
- shareholders – by achieving above-average returns
- the environment – by acting sustainably

## 2. Appreciation as the business driver

Clariant believes that appreciation drives success and helps customers stay ahead in their markets. Appreciation lies at the core of everything Clariant does, in every

area it is active in or has an influence: performance, people, and the planet. The company expresses appreciation to its stakeholders through a variety of channels: in its unflagging commitment to transparency and integrity; in fostering a culture of dialog and mutual respect; and by committing to sustainable, cutting-edge technologies. A continuous dialog allows Clariant to understand all stakeholders' needs and develop corresponding solutions that meet the most stringent standards and set new industry benchmarks. → **FIGURE 001**

## 3. Culture and reputation as the performance driver

Cultivating a corporate culture that balances business performance, social commitments, and environmental targets, while also upholding the goals of all stakeholders, is essential for generating value and sustainable growth. Clariant's corporate values embed appreciation in the company's culture and build the company's reputation and success. **Six central values** underlie a common set of employee behaviors and help strengthen the Clariant brand. → **FIGURE 002/003**

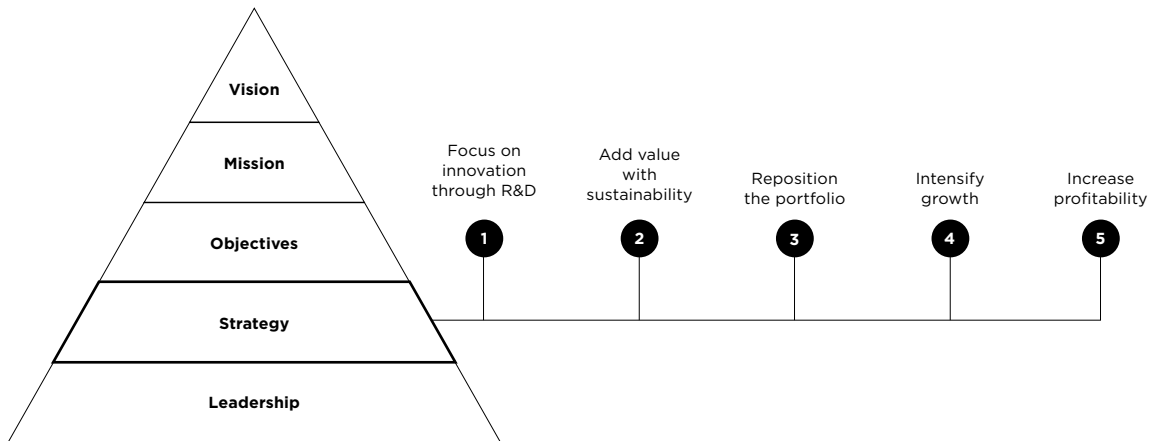
## 6

The corporate culture is shaped by six central values.

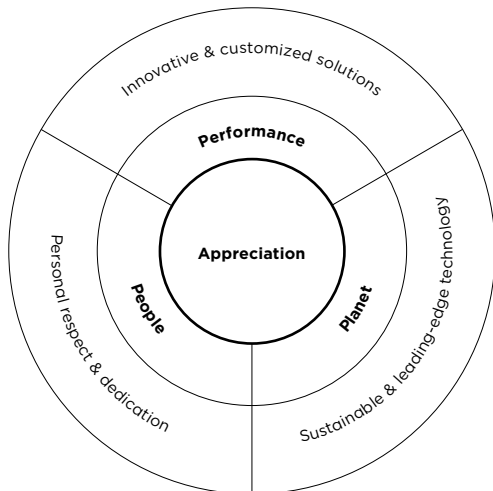
# »Our vision is to be the globally leading company for specialty chemicals.«

**Hariolf Kottmann**  
Chief Executive Officer

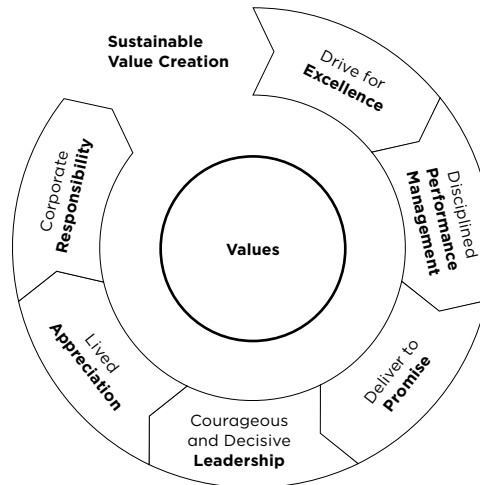
001 CLEARLY DERIVED STRATEGY



002 BRAND VALUES WITH A FOCUS ON PERFORMANCE, PEOPLE, AND PLANET



003 CORPORATE VALUES FOR SUSTAINABLE VALUE CREATION



# Materiality and Strategy

**Clariant's holistic approach to creating value for all stakeholders is underpinned by its established five-pillar strategy, overall objectives, and financial targets. The 2017 revision of the prioritization of material topics related to performance, people, and planet provides additional guidance for strategy execution in the Business Areas that are supported by the Clariant Excellence program.**

## 1. Long-term value creation

Clariant has a long-term and holistic approach to value creation. While paying close attention to the financial aspects of business, Clariant also takes non-financial aspects into account in order to create added value for customers, employees, shareholders, and the environment. Focusing on core topics such as customer loyalty, talent development, and innovation allows Clariant to set the course for future financial performance early on. This integrated view is crucial to further accelerate Clariant's profitable growth strategy.

## 2. Materiality assessment to focus on the essentials

To determine which levers offer the highest potential for value creation in the long run, Clariant conducted a comprehensive materiality assessment in 2017. Both external and internal stakeholders were asked which topics they deem most relevant for future value creation for the company. This prioritization of topics related to performance, people, and planet will help Clariant further develop its integrated management approach.

Materiality was evaluated in two dimensions, with stakeholders providing feedback on the relevance of each topic for Clariant from their perspective, and senior managers across the company assessing the importance of the topics for value creation by Clariant. The latter assessment included the potential influence of

each issue on strategy development and achievement, market positioning and growth opportunities, risk management, compliance, and reputation management. Through considering the risks and opportunities linked to Clariant's external impacts, the process indirectly took Clariant's potential effects on various aspects of sustainable development into account.

## 2.1. An inclusive approach

The assessment was based on two internationally recognized frameworks: the International Integrated Reporting framework issued by the International Integrated Reporting Council (IIRC) and the sustainability reporting standards of the Global Reporting Initiative (GRI). As a first step, economic, environmental, and social topics that are included in frameworks such as GRI, IIRC, SASB, UN Global Compact, and UN Sustainable Development Goals, as well as Clariant's previously determined material topics and topics defined by peers, were compiled. The resulting initial list of more than 400 topics was then consolidated to a list of less than 50 topics.

Secondly, a total of 283 external stakeholders including customers, investors, non-governmental organizations, sustainability experts, scientists, and suppliers, in addition to 106 employees and 64 management representatives, were invited to assess these topics. Clariant carefully defined a set of selection criteria to ensure a balanced representation of interests. In addition, stakeholders were approached by the closest person of contact at Clariant to encourage participation and bring forward well-informed opinions. Management and stakeholder surveys were conducted worldwide, with the latter being offered in English, German, Spanish, Portuguese, and Mandarin.

# 131

The materiality matrix was reviewed by 131 external stakeholders.



## 2.2. Broad response, focused results

Overall, the response rate was 52%, with **131 external stakeholders**, 69 employees, and 36 managers participating. Of the 131 external stakeholders, 74 customers responded to the survey. The outcome was evaluated and validated by senior management during a workshop.

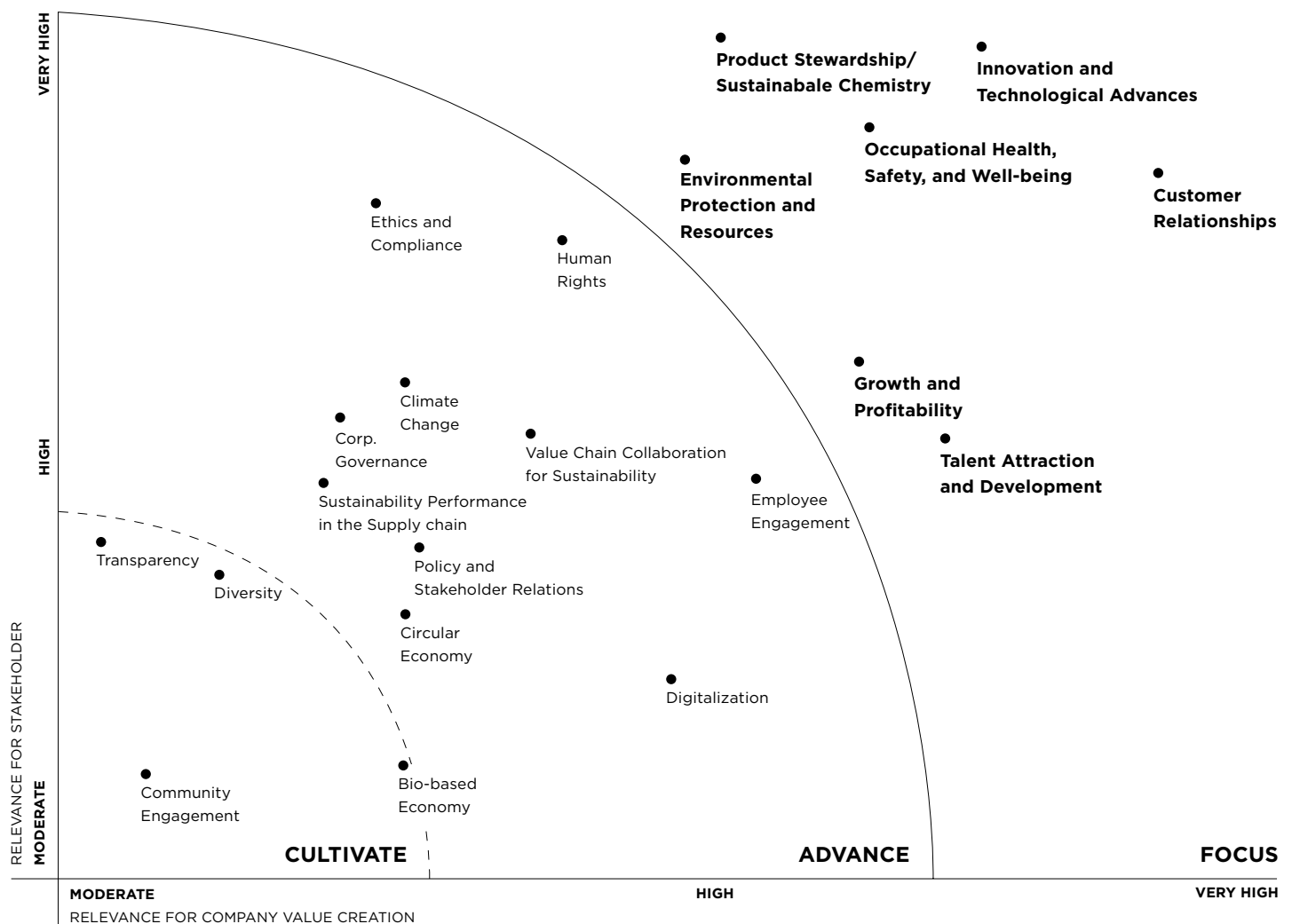
The results are summarized in the new Clariant Materiality Matrix → **FIGURE 001**, which shows topics considered moderately to highly relevant. The matrix depicts

the relevance of the topics from the stakeholder point of view on the vertical axis and relevance for value creation by Clariant on the horizontal axis. The topics are categorized in three areas: Cultivate, Advance, and Focus. Focus topics are considered to be at the core of Clariant’s ability to create long-term value. For topics in the Advance area, Clariant recognizes a need for further development in order to better meet company and stakeholder expectations. Topics in the Cultivate area are crucial for successfully creating value in the future.



**GRI Online Report**  
reports.clariant.com/  
2017/gri

001 CLARIANT MATERIALITY MATRIX



Information on material topics can be found throughout the Integrated Report, especially in the chapter Review of Results → **PAGE 116**, with additional information provided in the online GRI Report.

Focus topics are further illustrated by dedicated stories:

Innovation and Technological Advances: Growing ambitions → **PAGE 46**, Boosting innovations → **PAGE 90**, Delivering solutions → **PAGE 102**; Product Stewardship and Sustainable Chemistry: Promising results → **PAGE 78**, Ensuring trust → **PAGE 112**; Customer Relationships: Marketing advances → **PAGE 56**, Building connections → **PAGE 64**; Occupational Health, Safety, and Well-Being: Empowering change → **PAGE 150**; Environmental Protection and Resources: Driving sustainability → **PAGE 162**; Growth and Profitability: Increasing profitability → **PAGE 130**, The Voice of China becoming more important → **PAGE 20**; Talent Attraction and Development: Transforming journeys → **PAGE 26**

# Strategic Direction

**Materiality and strategy are inextricably linked. Bernd Högemann, Head of Corporate Planning & Strategy, and Joachim Krüger, Head of Corporate Sustainability & Regulatory Affairs, explore how this interaction is at the very core of long-term value creation.**

**Clariant is committed to creating value for all stakeholders: customers, employees, shareholders, and the environment. What does that mean?**

**BERND HÖGEMANN:** From a purely financial viewpoint, value creation equals maximizing economic profit and, if distributed to shareholders, Total Return to Shareholders. However, a purely financial perspective can lead to short-termism and jeopardize the longevity of the company. At Clariant, we look at multiple stakeholders to achieve long-term and sustainable value creation: To serve our customers' needs, to build on a highly qualified and engaged workforce, just to name two core stakeholder groups, are core levers to deliver long-term value creation. We are convinced that long-term stakeholder and shareholder interests are significantly intertwined and that we create above-average value for our shareholders by considering the needs of all our stakeholders.

**JOACHIM KRÜGER:** In other words, we look at the triple bottom line: Performance, People, Planet. If we do not take into account the needs of the people and the planet, we will not perform well financially. And vice versa: If

we do not perform well financially, we neither benefit the people nor the planet. That is why we focus not only on financial sustainability, but also on product sustainability and the sustainability of our operations. Thereby, we benefit shareholders, customers, employees, and society at large.

**How does that materialize in day-to-day business?**

**BERND HÖGEMANN:** If we look at innovation, for example, a long-term perspective is crucial for maintaining or even enhancing our ability to create value in the future. In our industry, investments in research and development typically have a payback horizon of potentially several years. Making these investments and holding on to promising innovation projects – even if they do not generate profits in the short term – is key for Clariant to remain in business over the long run.

**JOACHIM KRÜGER:** The same holds true for investments in our employees. Developing talents and fostering an attractive work environment does not yield immediate financial returns, but it is essential for our future success. The more we focus on both financial and non-financial targets supporting our growth strategy, the better our overall performance will be.

**You pointed out that taking the interests and needs of different stakeholders into consideration is decisive for long-term value creation.**

**What role does the materiality assessment Clariant conducted in 2017 play in this regard?**

**JOACHIM KRÜGER:** We have asked both external and internal stakeholders which topics they deem most relevant for Clariant to create value. By considering the views of more than 200 customers, investors, NGOs, regulators, employees, and senior managers we have gained valuable insights that help us identify strategic opportunities. On the one hand, the assessment con-

firmed that we are doing the right things; on the other hand, new topics have come into the picture. For example, we were happy to see that »Product Stewardship and Sustainable Chemistry« is still very high on the agenda of our stakeholders. What surprised us was that »Bio-based Economy« ranks comparatively low. However, only at first sight. Because when looking at our product range, bio-based chemistry is highly relevant for some of our businesses, but not for all of them in the same way. Overall, we consider the materiality assessment a success. The good response rate of 52 % shows that our stakeholders were willing to make the effort and share their view. We really appreciate that.

**BERND HÖGEMANN:** The materiality assessment sets the guardrails for strategy development. We take the insights from the assessment as a core input to our new

Strategic Management Process Cycle 2018 – 2021. A strategy that does not consider the results of such a comprehensive assessment is doomed to failure. Disregarding »Talent Attraction and Development«, for example, is just not an option. Keeping sight of other material topics, such as »Bio-based Economy«, is crucial for successfully creating value in the future.

**Speaking of strategy, how can Clariant thrive in the increasingly challenging business environment of the specialty chemicals industry?**

**BERND HÖGEMANN:** Clariant has a robust business model and a particularly strong growth profile: Our chemistry goes into the value chains of end-consumer markets that are growing alongside global GDP – some markets even significantly above global GDP. The key to outper-

**»We are convinced that long-term stakeholder and shareholder interests are significantly intertwined.«**

**Bernd Högemann**  
Head of Corporate  
Planning & Strategy



# »Sustainability fuels our innovation pipeline.«

**Joachim Krüger**

Head of Corporate Sustainability & Regulatory Affairs



forming competition is to differentiate ourselves with our products. And here, sustainability comes in. Meeting the increasing demand for sustainable solutions with innovative products is the starting point to higher growth and higher financial results. This is why we emphasize innovation and sustainability as two strategic pillars out of five – and even more so going forward.

**JOACHIM KRÜGER:** As Bernd Högemann just outlined, in order to succeed, Clariant needs to be extremely innovative – and sustainability fuels innovation. Customers and society at large request that we offer products that are carefully formulated and also enable society to fix problems. These expectations are reflected in the United Nations Sustainable Development Goals. Clariant is well equipped to deliver on these expectations. We offer a broad range of products that enable our customers to develop solutions – especially when it comes to climate change and raw materials. Substituting less sustainable alternatives on the market with our innovative and sustainable products allows us to gain market share.

**Differentiating with innovation and sustainability seems to be a bold undertaking when almost every chemical company claims to be sustainable. What sets Clariant apart?**

**JOACHIM KRÜGER:** We deliver the proof points. For example, we screen our innovation pipeline and our product portfolio based on 36 sustainability criteria. Products that show an excellent sustainability profile are labeled EcoTain®. Our efforts are very well received by the markets, as the outstanding growth rates of our EcoTain® products show.

**BERND HÖGEMANN:** Substantiated claims are key when it comes to selling our products and services – only then we can convince our customers. And that is the real driver of sustainable, above-market, profitable growth.

### 3. Sustainable Development Goals

Clariant appreciates the adoption of the 2030 Agenda for Sustainable Development by the United Nations member states in September 2015. The Agenda, including its 17 Sustainable Development Goals (SDGs), marks a milestone on the path to a more sustainable future. The universally accepted goals are highly relevant for the chemical industry and Clariant is committed to contributing to their realization. The SDGs are in many ways congruent with Clariant's sustainability objectives, strategy, and values.

Sustainability for Clariant is a journey – a continuous effort to steer the company's activities and product portfolio to contribute positively to global sustainable development. Examples of Clariant's contributions to the SDGs are the 2025 environmental targets → **PAGE 156**, the company's efforts to promote health and safety in the workplace → **PAGE 142**, and the extensive work done through the Portfolio Value Program (PVP) to screen the product portfolio for sustainability and bring forward more sustainable products and Eco-Tain® products. → **PAGE 134** These initiatives contribute to several of the SDGs, such as SDG 12 »Responsible

Consumption and Production«, SDG 8 »Decent Work and Economic Growth«, and SDG 6 »Clean Water and Sanitation«, given that they have wide sustainability contributions to value chains, communities, or society. Further examples are provided in more detail in this report, such as offering products with reduced Volatile Organic Compounds (VOC) → **PAGE 162**, the research and development work done in a new greenhouse supporting sustainable crop protection → **PAGE 46**, and the setup of our sunliquid® plant in Romania, supporting clean energy and climate change mitigation objectives. → **PAGE 40**

Clariant has come a long way, evidenced by the inclusion in the renowned Dow Jones Sustainability Index for the fifth year in a row and by the Silver Class Distinction in the RobecoSam Yearbook 2018. However, Clariant recognizes the opportunity offered by the SDGs to share a common framework of action and language when communicating with stakeholders and reporting on sustainability objectives, impact, and performance. Clariant thus plans to further increase transparency on the alignment of its strategy with the SDGs and to regularly report on the progress made toward achieving them.

#### 002 CLARIANT SUPPORTS THE SUSTAINABLE DEVELOPMENT GOALS



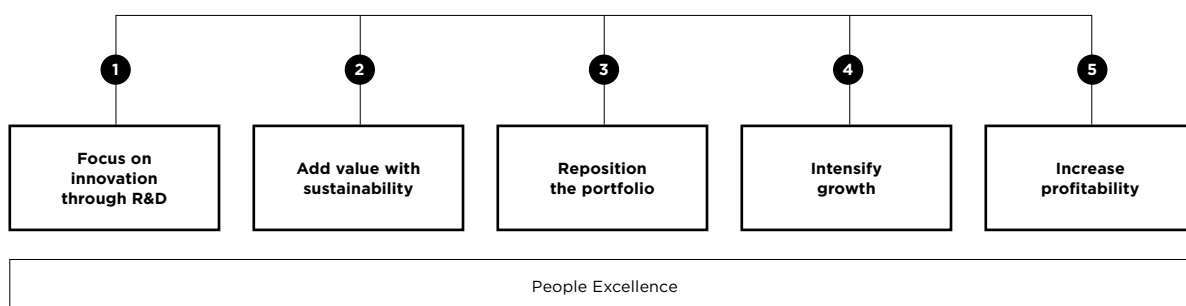
Source: United Nations Department of Public Information

## »Sustainable growth requires relentless focus on costs while developing differentiating capabilities and organizing for growth.«

Harald Dialer

Head of Clariant Excellence

### 003 THE FIVE-PILLAR STRATEGY



#### 4. Five-pillar strategy to provide guidance

The five-pillar strategy → **FIGURE 003** summarizes Clariant's approach to long-term value creation for its stakeholders: the two strategic pillars of innovation and sustainability, complemented by repositioning the portfolio, intensifying growth, and increasing profitability.

Each of Clariant's Business Units has specific strategies that align with the five pillars, detailing the measures and guidance that help the unit achieve its targets. To support the monitoring and execution of strategy across the company, the Executive Committee conducts an Annual Performance Cycle. A formal Strategy Review in September includes stress-testing the assumptions underlying the three-year Business Unit Strategy Cycle, and precedes the annual Objective Discussion for the following year. Business Reviews are conducted every quarter to ensure performance meets expectations and supportive actions are discussed and decided upon where required.

#### 5. Overall objectives and financial targets for achieving Clariant's vision

To fulfill its vision to become the globally leading company for specialty chemicals and deliver above-average value creation for all stakeholders, Clariant has defined central financial targets and overall objectives. The prioritization of topics related to performance, people, and planet resulting from the materiality assessment helps Clariant further develop its integrated management approach. Clariant will use the insights gained as a core input for its Strategic Management Process Cycle 2018 – 2021.

##### 5.1 Profitability as a central metric

A key financial topic where a quantitative, mid-term target has been set is profitability. Clariant is committed to achieving an EBITDA margin before exceptional items of 16 – 19 % in the medium term. → **FIGURE 004** The company has made continuous progress in that direction over the past few years, and **increased its EBITDA margin by 10 basis points to 15.3%** again in 2017, exceeding the previous year. → **PAGE 118**

## 15.3

**The EBITDA margin** before exceptional items increased by 10 basis points to 15.3 %.

# 162

**1245 Clariant Excellence projects** resulted in net benefits of CHF 162 million.

004 **FROM AVERAGE TO THE TOP - ADVANCING INTO THE TOP TIER IN SPECIALTY CHEMICALS**

EBITDA <sup>1</sup>	2001-2009	2010-2017	midterm
> 20%			CLARIANT
16 - 19%		CLARIANT	
10 - 15%	CLARIANT		
< 10%			

<sup>1</sup> before exceptional items

**5.2. Qualitative financial and non-financial aspirations**

In order to advance the company into the top tier in specialty chemicals, financial targets also include achieving **return on invested capital (ROIC)** above the peer group average, organic growth above global GDP growth rate, and strong cash flow generation.

Overall objectives are articulated in more qualitative terms and relate to Clariant's different stakeholder groups:

- Clariant wants to be a publicly listed company with a broad shareholder base, reliable long-term anchor shareholders, and a high reputation for above-industry average profitability, growth, and Total Return to Shareholders (TRS).
- Clariant strives to serve markets with future perspectives and strong growth rates and to focus on businesses with competitive position and purchasing power.

- Clariant aspires to be known as a powerhouse for R&D and innovation and to increase value by applying sustainability.
- Clariant aspires to be a preferred employer.

**6. Clariant Excellence strengthens value creation**

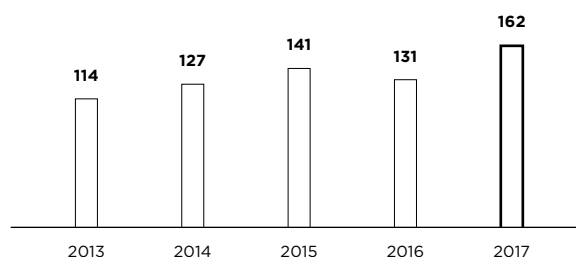
Clariant Excellence (CLNX), the company's Business Excellence program, supports the Business Units in their strategy execution. Along with People Excellence → **PAGE 22**, the program comprises Clariant Innovation Excellence (CIX), Commercial Excellence (CCE), and Operational Excellence (COX), which includes related initiatives such as Clariant Supply Chain System (CSS), Procurement Excellence (CPX), Production System (CPS), and Lean Service Organization (LSO). These linked initiatives are driving value from EBIT improvements and cash flow from additional growth.

In total 1245 CLNX improvement projects delivered additional **net benefits of CHF 162 million** in 2017. How CLNX supports systematic value creation along the entire value chain – from ideation for new products, services, or business models to defining commercial strategy to ultimately ensuring effective and efficient production and delivery of finished goods to our customers – is discussed in more detail in the chapter »A Strong Engine for Value Creation«. → **PAGE 34**

## 10.2

The return on invested capital (ROIC) was 10.2%.

005 **NET BENEFIT BY CLARIANT EXCELLENCE** in CHF m



# The Voice of China Becoming More Important

**China is playing an increasing strategic role for Clariant. Christian Kohlpaintner, Member of the Executive Committee, has been based in Shanghai, China, since 2016, and provides an update on the progress made to drive opportunities for further value creation in the region.**

**Mr. Kohlpaintner, it is now almost two years since you relocated to China. What is your impression of the business conditions in the region?**

**CHRISTIAN KOHLPAINTNER** China continues to change at a rapid pace, largely driven by its government's policies. In general we see the industry upgrading to higher value and more technology-driven solutions. Environmentally-compatible chemical solutions are a high priority, as regulation is becoming stricter. This provides opportunities for companies like Clariant with high global standards and innovative solutions, especially those that help address environmental concerns such as pollution. But it is clear that, if we want to be successful in China, our business must adapt to the Chinese business mindset.

**What role does China play in Clariant's growth strategy?**

China is fundamental to our growth strategy. We said some years back that the center of gravity is shifting eastwards and Clariant has to be better positioned to seize the opportunities. Achieving our ambition level called for bold changes. This was why, at the beginning of 2017, we began to reshape our business with a new regional governance model.

Our Business Units adapted their regional organizations accordingly and we focused especially on recruiting local talents. The new positions were filled with Chinese top managers. They have profit and loss responsibilities for their regional Business Lines, being members of the global management committees of their Business Units and also being members of the Global Management Team of Clariant Group. The result is greatly improved

strategic dialog and alignment. And we will establish the role of a China president, also a Chinese native, who will be accountable along with the Business Units for our financial success in China.

Our strategy is based on a solid strategic framework that sets out our vision to become a China insider.

**How are these strategic and organizational measures impacting the business in the region?**

2017 was a successful year for Clariant in China, with 13 % sales growth and an increase in profitability. Compared to five years ago, Clariant has significantly improved its standing in the chemical community in the region and has built a reputation as a company that successfully embraces sustainability.

We expanded capacities for the Business Units Additives and Masterbatches and invested in new facilities, which will enable us to meet growing local demand and improve proximity to customers and also raw material suppliers. Besides this, the company took further steps to expand its business with activities such as the partnerships with Sinopec announced by Business Unit Catalysts as well as a production joint venture from Business Unit Additives. These ties are helping us to gain valuable market insights and exchange best practice.

Clariant is also proactively taking on a leadership role in driving innovation and sustainability in the industry. We created the China Clean Tech Award for young scientists and intensified our engagement with the China Petroleum & Chemical Industry Federation (CPCIF). Here we initiated and led a sustainability working group with other multinational companies at their annual conference in Shanghai. At the event, Clariant also signed a memorandum of understanding to jointly explore new areas of cooperation and promote innovation and sustainability within the petroleum and chemical industry in China.



The company has significantly strengthened its governmental relations, especially at local levels where we are operating our sites. This is enabling both further investment and value creation. 2017 also saw Clariant achieve recognition externally in the fields of innovation, sustainability, and corporate social responsibility. This is very encouraging.

**What will be the priorities for 2018 and beyond?**

2018 is about building on what we achieved in 2017, deepening and developing relationships, and evaluating further investment opportunities. With our China governance model in place and sustainability and innovation at the center of the business strategy, the company

is well positioned to capture new growth opportunities. In 2018, we will launch our first AliBaba flagship store to increase our market penetration. Other key initiatives and events such as the biennial »Defining the Future« conference of Business Unit Catalysts will help to drive innovation endeavors in the industry. The Shanghai-based One Clariant Campus is set to open in 2020 and will include an innovation center, allowing us to develop products in China for China, and also other markets. We are convinced that with our all-encompassing growth initiative we are able to double our sales from the 2015 baseline until 2021. I think Clariant is an excellent role model in the region. It's an exciting time for the industry and our business. → PAGE 162

# 13

Clariant's growth rate in China rose to 13%.



**Christian Kohlpaintner**  
Member of the Executive Committee

# Leadership and Employees

**Clariant cultivates a high-performance culture that is founded on strong leadership and a commitment to continuous development. Through honest, authentic, and consistent behaviors, Clariant's leaders inspire and motivate their teams to continuously learn and achieve strong results.**

## 1. Leading the way to performance and continuous development

People Excellence, Clariant's philosophy for leading people and translating business strategies into relevant employee initiatives, embodies three major elements:

- Defining key leadership requirements and evaluating the status quo
- Designing the people strategy
- Translating measures into people processes.

To identify the key leadership requirements that are needed for success, the company must first understand the opportunities and challenges that arise when implementing the strategy. Clariant evaluated its senior management as part of its regular review to analyze individual leadership and business competencies. In addition, Clariant rolled out a structured competency evaluation process for its innovation leaders, creating a solid foundation for systematic, needs-based, and future-oriented skills development.

In 2017, Clariant systematically analyzes its recruitment needs, the onboarding experience of new hires, and the return on investments in training and development, in order to further define its people strategy. The people strategy summarizes priorities for all stages of the people cycle (attraction, recruitment, onboarding, development, retention, separation), each of which is necessary to execute business strategies successfully. It also sets out specific, actionable measures to support employees worldwide in becoming better at what they do. These measures enhance Clariant's people processes, which are then tailored in a systematic way to the specific requirements of Business and Service Units.

## 2. Developing internal talent and shaping new leaders

Talent management is a crucial element of a high-performance organization. By proactively developing and promoting internal talent, Clariant manages to fill key positions with internal talents and to retain specialists. In 2017, more than **85% of open positions in Group Management** were filled internally. → **PAGE 139**

# 85

**Group Management** positions were filled to more than 85% with internal talents.

# 1000

**Effective collaboration** is key to increase team performance. In 2017, 1000 employees completed an effectiveness program.

Strong leadership capabilities enable key position holders to choose the right people, motivate, develop, and promote them according to their individual potential. Clariant has invested in diverse learning formats to continuously develop these leadership skills. For example, the »License to Hire« training, launched in 2017, provides a toolkit for efficient recruiting and supports line managers in making the right hiring decisions. Clariant also launched the »Frontline Leadership Training«, which targets frontline leaders such as Production Managers or Shift Leaders. The training introduces basic leadership instruments, enabling managers to effectively lead and motivate teams, and to manage change. In addition to the leadership curriculum, Clariant is establishing and implementing learning formats to strengthen job-specific functional skills such as commercial competencies.

### 3. Adapting to evolving market requirements

With market requirements changing quickly, Clariant's training and education initiatives have become increasingly agile to guarantee the development of required skills and knowledge within the organization. All programs are designed as modules that can be flexibly adapted to the specific needs of the target groups. Real-time virtual trainings also increase flexibility, as participants across regions can join them comfortably from their workplace, saving travel time and avoiding harmful emissions. Additionally, Clariant offers a variety

of e-learning modules within its global HR system »MySuccess«. These e-learning modules give learners the freedom to set their own pace and continue the program individually, based on their availability. Read more about how the digital HR system transforms work. → **PAGE 26**

Clariant's learning philosophy – the »self-directed lifelong learning journey« – emphasizes that employees should never stop enhancing their own competencies. Clariant encourages employees to share their knowledge, best practices, and lessons learned with their peers in facilitated workshops and interactive learning sessions. In 2017, Clariant implemented a »Team Effectiveness Program«, supporting teams across all organizational levels in increasing team cohesion, trust, and effective collaboration. More than **1000 employees completed the program** so far.

### 4. Addressing regional needs and tapping the full potential of marketing and innovation

After defining global people strategies for each Business Unit in 2017, Clariant will develop tailor-made solutions and priorities for each region in 2018. Initiatives include job rotations, short-term assignments, trainings to enhance technical competencies in emerging markets, and the implementation of tailored onboarding programs to accelerate the integration of newly hired employees.



**Clariant performed** an in-depth analysis of the results of the second Employee Engagement Survey to better understand the concerns and needs of the workforce.

In 2018, Clariant will also tap the full potential of the reorganized marketing organizations by launching a global marketing training program. Designed to foster collaboration between innovation, marketing, and sales teams, the program will ensure better alignment of all commercial activities and strengthen Clariant's marketing expertise in order to become a Leading Marketing Organization. → **PAGE 56**

#### **5. Positioning Clariant as a preferred employer**

To stay competitive in a contested market, Clariant needs to retain its most valuable and differentiating asset: its people. They create, improve, protect, and deliver Clariant's services and products and are at the core of sustainable value creation. Clariant positions itself as a preferred employer by focusing on its core value: Appreciation. This means providing the support and resources that employees need to achieve their goals and giving credit for extra efforts. Moreover, Clariant offers challenging assignments, enabling employees to grow professionally and unleash their full potential, which is at the heart of Clariant's vision for People Excellence.

#### **6. Engaging with a diverse workforce and guaranteeing fair working conditions**

For Clariant, diversity encompasses not only varied cultural and geographical backgrounds and experiences, but also different ways of thinking and acting. Diverse perspectives lead to a differentiated view on market potentials and opportunities and foster an environment

of innovation and growth. Diversity is also valued in the recruitment of candidates, by evaluating individual development potential in addition to experience during the placement process.

Engaging with a diverse workforce starts with valuing diversity in career management, promoting for potential and valuing healthy and motivating leadership behaviors. After all, Clariant values those behaviors which reflect the six corporate values. → **PAGE 11**

**»Strong leadership, continuous development and consequence management are essential for a high-performance culture.«**

**Klementina Pejic**  
Head of Group Human Resources

**Lynn Ong**  
Team Leader Global Business Services



# Transforming Journeys

# 32 0000

**So far**, Clariant has received and processed around 32 000 job applications via its new digital platform.

## **Clariant's new digital approach to HR management helps to make hiring, training and advancing people both more efficient and personal.**

It had been a while since Lynn Ong was in the market for a new job. »I was with my previous employer for about 16 years«, she says. Then, in 2016, big changes at the microprocessor company where she worked in Singapore made her customer service job redundant. She had the choice to either move to another location or to leave. She chose the latter, took the severance package and looked for a new challenge. »I was a bit nervous of course«, she says. »A lot has changed in the job market.« Back in 2001, when she last applied for a job, there was no LinkedIn and no smartphone and Google was still the »new big thing« on the internet. »Searching and applying for a job back then was probably not so different than it had been a decade or two earlier«, Lynn Ong says, adding: »I found my job in the newspaper listings.«

So in 2017 Lynn brushed up her online presence on career networks like LinkedIn and made use of their resources. »I searched for openings that fit my profile«, she remembers. She has extensive experience working in customer service for a tech company. »So when I found the job posting by Clariant Global Business Services for a position in their Customer Service Team Lead, I felt that I was a great fit.« Clariant agreed, and

after a short e-mail exchange, she was invited for an interview at the Singapore office. What she didn't realize then was that she had already entered Clariant's new digital HR management. »We have established a complete system where every step of finding and hiring new employees as well as bringing them onboard is part of a so-called digital journey«, says Suzanne Soh, Clariant's Head of HR Asia. That journey starts with Clariant's presence online. »We've consistently enlarged our digital footprint in recent years, both in social media and professional networks«, says Suzanne. The company uses platforms like LinkedIn or glassdoor.com to actively engage current and potential employees. »It is essential that we do this in a coordinated and consistent way«, Suzanne explains. »So what is posted and how it reflects our company and our values bolsters Clariant's reputation as a preferred employer.«

Reputation matters. Especially to potential applicants like Lynn Ong who had not heard much about Clariant beforehand. Websites like glassdoor.com, for example, let employees and applicants rate companies based on their personal experiences – anything from job interviews to salaries, benefits, and the overall work environment. These peer reviews give job seekers a good idea of what to expect. »Online resources are commonly referred to these days«, says Cecilia Soh, another recent hire for Clariant in Singapore. Cecilia entered the company around the same time as Lynn and works in customer service for the Functional Minerals Business Unit. Although she is around the same age as Lynn, she has changed jobs in recent years and has therefore

stayed more attuned to trends in the online job market. Using apps on her smartphone to check for job openings is nothing new to her. She had heard of Clariant before, but did some research online too. What she found was apparently convincing. Cecilia joined the sales team in May 2017. »It's great«, she says of her first few months with the company.

Achieving a smooth transition into the new job is part of Clariant's digital journey too. While Cecilia joined Clariant without much of a gap from her previous job, Lynn had a few weeks off before her first day. She took the time to complete several courses. »They were part of my severance package, so I took the opportunity to brush up on some skills and learn a few new ones«, she says. During this time Clariant already provided her with further information about her new company and her new job. They also got some paperwork out of the way. »It's not like we are giving them big chunks of homework«, says Suzanne. »But they can familiarize themselves with our Code of Conduct, for example. We also try to get necessary signatures and agreements out of the way beforehand. This way, on day one, they can hit the ground running.«

Once Lynn Ong and Cecilia Soh started their jobs, they encountered what Clariant calls »MySuccess – Solutions for People«. It's a cloud-based HR portal introduced in 2014. It has since been extended and has completely changed how the company conducts most of its HR management. One of its advantages is transparency. »Our aim is to provide transparency on data and processes to employees and managers and thus simplify the daily collaboration«, says Suzanne. For example, the



## BENEFITS »MYSUCCESS« OFFERS

### EMPLOYEES

more transparency and individual responsibility, easier access to personal data and relevant HR topics, and greater working flexibility

### MANAGERS

better access to relevant HR data, global management of employees and teams, and improved, fact-based decision-making

### HR STAFF

further integrated and optimized HR work, improved processes, reduced administrative tasks and more time for focused counseling

platform lets employees manage their personal information themselves. »It's what we're all used to with other online services anyway«, says Suzanne Soh. It's not just millennials that see it that way. »It just makes sense that I don't have to apply to some central organization whenever my address, phone number or bank details change«, says Lynn. »Plus, I get a better idea of what the company actually knows about me.«

Taking matters into your own hands is helpful in other ways too. »MySuccess« has been adding more and more features that allow employees to build their knowledge and their career with Clariant. »MyOnboarding«, for example, guides new hires through their first weeks with the company. It gives them all the necessary information but also lets them find their own way around. »MyRecruitment« lets managers initiate recruitments directly – from defining a job profile to posting an opening either internally or on the web. That's how the job offers Lynn and Cecilia responded to ended up online. »MyLearning« lets employees – not just new ones – choose and manage which online courses and training programs they take. Managers can even assign courses directly to their employees whenever needed. »MyPerformance« helps employees and their managers set and track goals in a collaborative way. All the necessary administrative steps for each module and HR task are streamlined and transparent. So whenever a request or decision gets stuck, everyone involved knows what's going on.

»There are more modules in the works«, says Klementina Pejic. As Head of Group HR, she is busy promoting and explaining the new digital approach in HR management to people inside as well as outside the company. One of the questions she's been asked is whether Clariant is making their HR department redundant. »Not at all«, she says. »With the new HR online services, we are

# 1300

In the new cloud-based HR portal employees have completed 1300 self-service workflows.



# »Our aim is to provide transparency on data and processes to employees and managers and thus simplify the daily collaboration.«

**Suzanne Soh**  
Head of Region HR Asia

reducing manual steps, which frees up valuable time for our HR staff. This allows us to focus more on actual consulting and counseling, an integral part of our role as a trusted partner of the business. Personal dialog is still the core of our operations. In addition, well-established digital HR solutions aim to provide full transparency of available services and programs to all our employees and to support line managers in their daily leadership.« After all, HR should be about people. And if done right, digital transformation puts people back in charge.



**Cecilia Soh**  
Senior Customer Service  
Executive

# Overview on Corporate Governance and Compensation

Clariant is committed to international compliance standards, ensuring checks and balances between the Board and Management, as well as a sustainable approach to value creation. The compensation philosophy supports Clariant's ambition to be an employer of choice and is designed to attract, motivate, and retain committed employees.

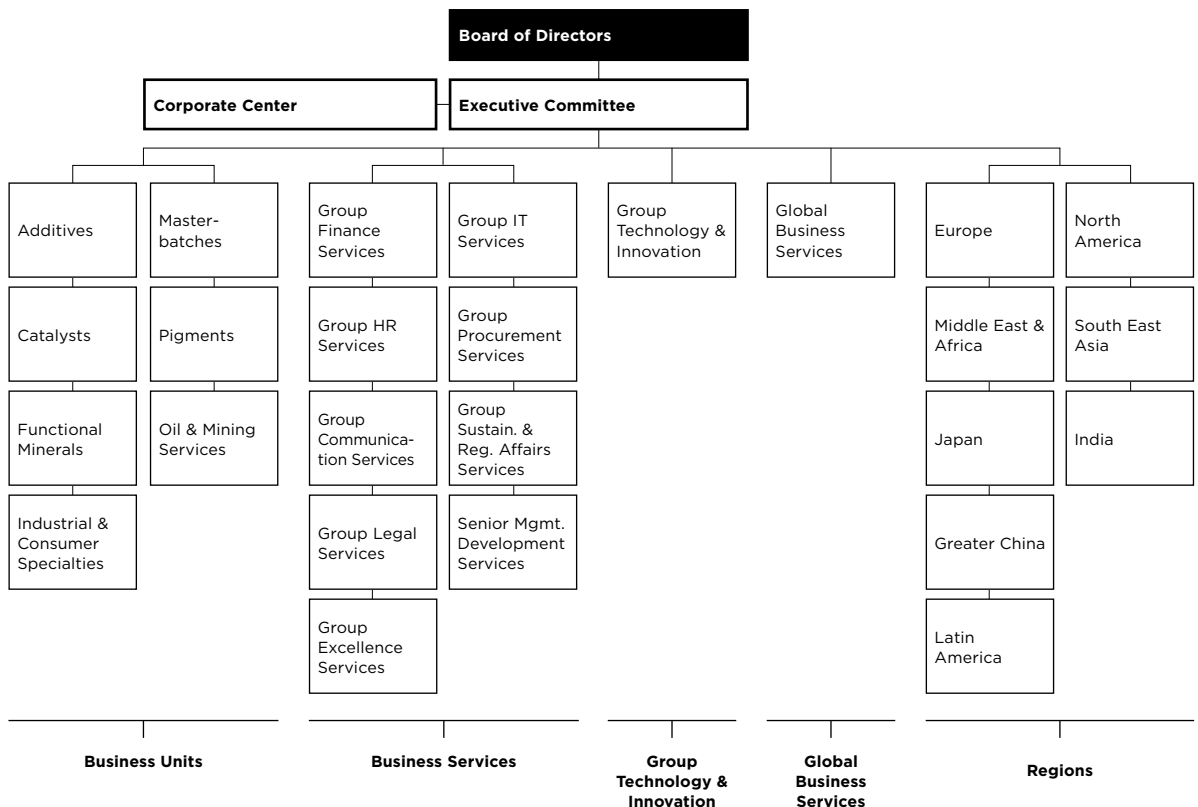
## 1. Corporate Governance

The Group is committed to Swiss and international standards of corporate governance by following the respective statutory provisions and the rules issued by the SIX Swiss Exchange, and by implementing the principles of the Swiss Code of Best Practices for Corporate Governance, revised in 2014.

## 1.1. Organizational overview

Clariant is headquartered in Muttenz, Switzerland, and reports in the four Business Areas: Care Chemicals, Catalysis, Natural Resources, and Plastics & Coatings, which are organized into seven Business Units. The organizational structure → **FIGURE 001** further comprises nine Business Services, Group Technology & Innovation (GTI), Global Business Services, Regional Service Centers, and the Corporate Center, which centralizes key corporate functions. The Executive Committee is responsible for the management of the Group.

001 CLARIANT ORGANIZATIONAL STRUCTURE





### Corporate Governance Report and Compensation Report

This short overview summarizes some aspects of corporate governance and compensation that are particularly relevant for integrated value creation at Clariant. For more detailed information, see the separate Corporate Governance and Compensation reports on

[reports.clariant.com/2017/corporategovernance](https://reports.clariant.com/2017/corporategovernance)

[reports.clariant.com/2017/compensation](https://reports.clariant.com/2017/compensation)

## 1.2. The Board of Directors and its committees

At the end of 2017, the Board of Directors of Clariant Ltd was comprised of **10 members**: Günter von Au, Peter Chen, Hariolf Kottmann, Eveline Saupper, Carlo G. Soave, Peter Steiner, Claudia Suessmuth Dyckerhoff, Susanne Wamsler, Rudolf Wehrli, and Konstantin Winterstein. All of whom (except for the CEO Hariolf Kottmann) are considered to be independent in accordance with international best-practice standards. Of the three female and seven male Board of Directors members, two were 50 years or younger, and eight were over 50 years.

The Board of Directors stands for election or re-election for one-year terms. The Chairman of the Board of Directors as well as the members of the Compensation Committee are elected individually for a term of one year by the Annual General Meeting. The members of the Board of Directors constitute the following committees:

- Chairman's & Nomination Committee: The responsibilities of this committee include making decisions on financial and other matters delegated by the Board of Directors and submitting to the Board of Directors the CEO's proposals concerning candidates for Executive Committee positions.
- Compensation Committee: Responsibilities of this committee include reviewing and proposing to the Board of Directors the compensation and benefits policies and programs and determining individual executive compensation and benefits of the members of the Board of Directors and the Executive Committee, subject to the approvals of the total compensations by the Annual General Meeting.

- Audit Committee: The committee's responsibilities include reviewing the company's internal control and risk management systems, compliance with the law and internal regulations (in particular with the Code of Conduct), and reviewing and recommending the Group's financial statements for the first three quarters of each year and the annual financial results for the Board of Directors' approval. A majority of this committee's members must have financial and accounting experience.
- Technology and Innovation Committee: This committee is comprised of four members of the Board of Directors with experience in research, innovation management, and technology, and its tasks include assessing the company's innovative activities on behalf of the Board of Directors. It also reviews measures to stimulate research and development and optimize innovative potential, as well as submits appropriate recommendations to the Board of Directors.

The Board of Directors is the ultimate decision-making authority for Clariant Ltd in all matters except those decisions reserved by law or the Articles of Association for the shareholders. The Board provides the strategic direction of the Group and the company's strategy is reviewed and further developed once a year during a two-day Board of Directors' meeting.

# 10

**The Board of Directors** is comprised of 10 members, of which three are women.



**The Executive Committee**

Hariolf Kottmann (CEO),  
Britta Fuenfstueck,  
Christian Kohlpaintner,  
Patrick Jany (CFO)

### 1.3. Management of the Group

The Board of Directors has delegated the executive management of the Clariant Group to the CEO and the other three members of the Executive Committee.

The Executive Committee is mainly responsible for implementing and monitoring the Group strategy, for the financial and operational management of the Group, and for the efficiency of the Group's structure and organization.

At the end of 2017, the Executive Committee consisted of CEO Hariolf Kottmann, CFO Patrick Jany, Britta Fuenfstueck and Christian Kohlpaintner. Of the female member and the three male members, two are in the age of 50 or younger and two over 50 years. They are appointed by the Board of Directors on the recommendation of the Chairman's & Nomination Committee.

### 1.4. Shareholders' participation rights

Subject to certain limitations on voting by nominees, each registered share entitles the holder to one vote at the Annual General Meeting. Shareholders have the right to receive dividends and such other rights as are granted by the Swiss Code of Obligations. However, only shareholders entered in the Clariant share register may exercise their voting rights.

Shareholders representing shares with a total par value of CHF 1 million have the right to submit written requests that an item be included on the agenda at least 45 days prior to the 24th Annual General Meeting on 1 April 2019.

### 1.5. Enterprise risk management

Based on the risk management standard of »The Institute of Risk Management«, a tool is used to prepare risk assessments each year by Business Units, Service Units, and Regions to assess threats that will impact the achievement of the objectives set for Clariant overall.

A consolidated risk assessment is submitted to the Executive Committee, the Audit Committee, and the Board of Directors for review. In case of new or changed risks, reporting is accelerated. To support functional responsibility, certain functions have access to risk assessments to assist them in their roles. Examples of such functions are Environmental Safety & Health Affairs (ESHA) to identify key sites for their property risk survey program, as well as Internal Audit and Group Procurement.

### 2. Compensation

To support the attraction, motivation, and retention of qualified and committed employees throughout the world, Clariant's remuneration policy is based on the following main principles:

- Alignment with Business Strategy: Remuneration Components are designed to support the Clariant Business Strategy.
- Competitiveness: Clariant is conducting regular benchmarking studies to ensure compensation levels are attractive and in line with market practices.

- **Compliance:** Clariant's compensation practices always follow local regulations such as laws and collective union agreements.
- **Internal Equity:** In order to ensure consistently fair treatment of employees working for Clariant, compensation guidelines and work instructions are in place.
- **Performance-Based Pay:** Clariant's Remuneration Elements aim to incentivize business and individual performance.
- **Transparency:** Remuneration Elements must be clear and transparent in order to be understood and appreciated.

002 **GLOBAL PAY MIX (RELATIVE STRUCTURE)**  
in % of total compensation

CEO	29	40	31
EC	36	33	31
ML 1	42	33	25
ML 2	47	30	23
ML 3	53	26	21
ML 4	65	26	9

Base Salary    Short-Term Incentives (STI)

Long-Term Incentives (LTI)

ML: Management Level

## 2.1. Remuneration structure

To ensure that shareholder and management interests are aligned, performance-based short-term and long-term incentives increase in relation to total compensation as responsibility/management level increases (see Global Pay Mix → **FIGURE 002**).

While long-term and short-term incentives are based on Group Performance Indicators, individual performance – measured through a consistent, global Performance Management system – is a determining factor in career development and annual salary reviews. Within the Global Performance Management System, each manager's or employee's performance is assessed and discussed on a yearly basis. Since 2012, the process includes 360-degree feedback for all management levels.

## 2.2. Linking compensation to sustainable value creation

Short-term incentive plans (cash bonuses) include the Group Management Bonus Plan, the Group Employee Bonus Plan, and the Global Sales Incentives Plan. Success in terms of bonus payouts is generally measured against

relevant Group Performance Indicators. The three pillars to balance the Group Management Bonus Plan are Group Financial Achievements, Business/Service Unit Achievements, and Top Priorities. In addition to financial indicators, the latter include, for example, consideration of sustainable inventory management, productivity, topline innovation sales, and occupational health and safety (LTAR).

Long-Term Incentive plans offer equity-based compensation for approximately 250 senior managers worldwide. The Long-Term Incentive plans aim to create a strong link between sustainable and profitable business development and employee rewards. They strengthen the entrepreneurial and value-creating mindset and align management and shareholder interests. One example is the Group Senior Management Long-Term Incentive plan, which allows key managers to invest a certain percentage of their annual cash bonus in Clariant shares and receive the same amount of matching shares after three years, subject to ongoing employment. In cases where a participant has substantially contributed to a financial loss, issues resulting in restatement of financial results, reputational damage or substantial breach of legal or regulatory requirements including internal policies, the Board of Directors can decide to withdraw the allocation of matching shares.

»The 2017 Integrated Report was checked and approved by the Board of Directors.«

**Rudolf Wehrli**

Chairman of the Board of Directors

**2017 IN NUMBERS**

Going off the beaten path is part of Clariant's business model. But so is reliability. The numbers in this chapter paint a picture of a company devoted to bringing value to its customers, providing not only superior products, but a unique know-how and exceptional service all over the world.

# A Strong Engine for Value Creation

# 211

**Clariant** spent CHF 211 million on R&D in 2017.

# 18

**In 2017**, 18 products were awarded the EcoTain® label.

# 515

**As part of** Clariant's Marketing Excellence initiatives 515 customer interviews were conducted in 2017.

# 20

**Operational Excellence initiatives** led to cost savings of CHF 20 million in 2017.

# 300

**Roughly 300 customers** of Business Unit Additives in North America are served from the Shared Service Center in India.

# 8

**Clariant operates** a strong innovation infrastructure consisting of 8 Research & Development Centers worldwide.

# Business Model

**Creating added value lies at the core of Clariant. The company’s business model is based on three value creation phases transforming diverse resources into innovative, sustainable solutions that create value for all stakeholders. Clariant’s second Integrated Report transparently communicates this comprehensive approach to value creation in the three dimensions of Performance, People, and Planet, which embody the brand’s values.**

## 1. Integrated Reporting

Value creation is a sophisticated process based on a multitude of resources that are both tangible and intangible, financial and non-financial. Integrated reporting represents this complexity by articulating how the company’s strategy, processes, performance, prospects, and governance lead to the creation of value by utilizing and transforming different forms of capital. This supports shareholders and other stakeholders, such as customers, employees, and suppliers, in making more informed decisions about their relationship with the company.

The core ideas of Clariant’s integrated reporting are based on the framework developed by the International Integrated Reporting Council (IIRC). The framework aims to foster sustainable change by promoting a more holistic approach to corporate reporting.

## 2. Creating sustainable value for all stakeholders

Clariant’s value creation process is fueled by six kinds of capital: financial, intellectual, manufactured, human, relationship, and natural. They are categorized under Clariant’s brand values of Performance (financial, intellectual, and manufactured capital), People (human and relationship capital), and Planet (natural capital). Clariant’s business model illustrates how the company draws on these various capitals as inputs and converts them into valuable outputs, such as products and services, benefitting customers, employees, shareholders, and the environment. → **PAGE 38/39**



### Financial Capital

The pool of funds available to the company for use in the production of goods or the provision of services. This can include funds obtained through financing, such as debt, equity, or grants, and funds generated by the company, for example through sales or investments.



### Intellectual Capital

Knowledge-based intangibles used and created by the company, often in collaboration with partners. This can include intellectual property, such as patents, trademarks, copyrights, software, rights, and licenses, and »organizational capital« such as tacit knowledge, systems, procedures, and protocols.



### Manufactured Capital

Manufactured physical objects such as buildings, equipment, and products. These can include objects that are available to the company for use in the production of goods or the provision of services, or that the company produces for sale to customers or for its own use.



### Human Capital

The company’s staff and its composition, competencies, capabilities, experience, and motivation to innovate. This can include employees’ alignment with corporate values and their ability to understand and implement the company’s strategy.



### Relationship Capital

Key relationships including those with significant groups of stakeholders and other networks. This can include shared values, the trust and willingness to engage and related intangibles associated with its brand and reputation.



### Natural Capital

Renewable and non-renewable environmental resources and processes that support the past, current, or future prosperity of the company or are affected by it. Examples can include resources related to air, water, and land that are utilized or impacted by emissions.



Clariant constantly engages with its stakeholders to stay attuned to their needs and gain feedback on how to best create value for them. In 2017, these engagements included 515 customer interviews conducted in the context of the Clariant Marketing Excellence Initiatives → **PAGE 54**, investor updates and presentations at analyst conferences, and employee dialogs that leaders initiated based on insights from the employee engagement survey in the previous year. → **PAGE 141** Faced with the challenges posed by climate change and environmental degradation, Clariant attaches great importance to conserving natural resources and protecting the environment in all its business activities. → **PAGE 156** Furthermore, Clariant engaged over 450 internal and external stakeholders in the process of determining the economic, social, and environmental topics that offer the highest potential for value creation for stakeholders and for the company. → **PAGE 12**

### **3. Three value creation phases fuel profitable growth**

A well-filled innovation pipeline, customer-centered sales and marketing processes, as well as safe and efficient production and reliable delivery are key factors in achieving profitable growth. Clariant's business model comprises three key value-creation phases: Idea to Market, Market to Customer, and

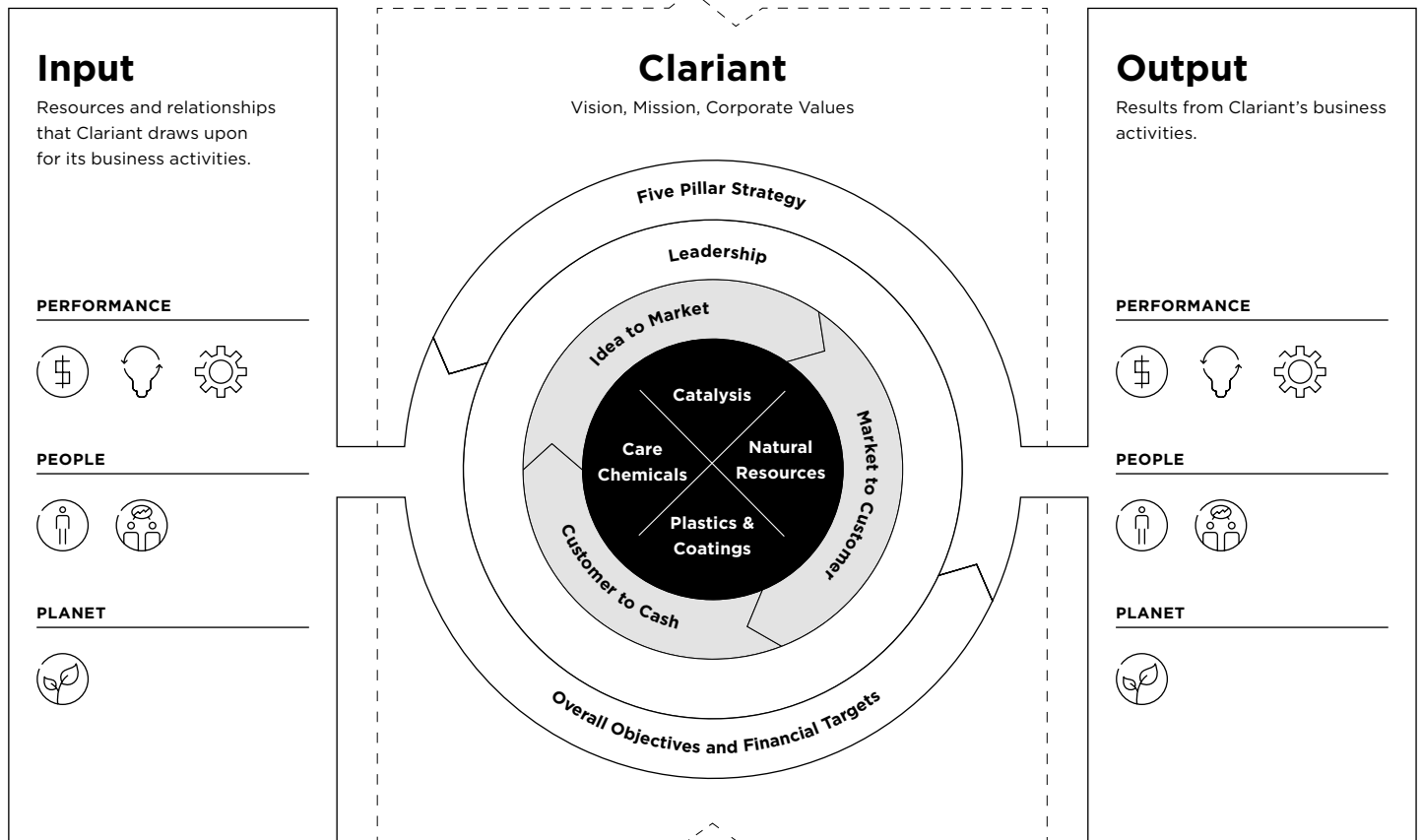
Customer to Cash. Idea to Market encompasses scouting global trends and ideas, scoping business opportunities and exploring unmet customer needs, executing product development, and commercializing and monitoring product performance. → **PAGE 40** Market to Customer includes identifying market attractiveness, developing a clear value proposition and articulating it to the customers, and capturing the value created through relationship building and the sales process. → **PAGE 52** Customer to Cash encompasses balancing demand and supply, optimizing sourcing for spend effectiveness, constantly monitoring production for high efficiency, and delivering finished goods on time and in full as required by the customer. → **PAGE 60**

Externally, overarching societal trends, market drivers, and economic developments shape the environment in which the business model creates value. By taking an outside-in perspective and viewing stakeholder needs and global challenges as business opportunities, Clariant contributes to solving societal and environmental challenges. In fulfilling this aspiration, Clariant draws on its Five-Pillar strategy with ambitious objectives → **PAGE 18**, an entrepreneurial leadership culture and dedicated employees → **PAGE 22** and four Business Areas that are leading in their respective fields. → **PAGE 70**

001 BUSINESS MODEL

## External Environment

Societal Trends and Market Drivers



FEEDBACK

OUTCOME ACHIEVED FOR

## Stakeholders

Clariant constantly engages with its stakeholders to stay attuned to their needs and gain feedback on how to best create value for them.

# Idea to Market

**By focusing on technology and innovation, Clariant stays ahead in dynamic markets. More than 1100 employees in Research and Development strive daily to develop innovative and sustainable solutions for customers by using leading technologies. Eight Research and Development Centers, more than 50 Technical Centers, and more than CHF 1 billion spent on R&D since 2013 — with CHF 211 million in 2017 alone — support Clariant's Innovation Chain. In this elaborate setup, four Technology Platforms support all Business Areas at translating unmet customer needs into market-ready solutions.**



IDEA TO MARKET

**Core business** activities that create additional value are structured into three value creation phases at Clariant. Idea to Market encompasses scouting global trends and ideas, scoping out customer needs, executing product development and commercializing, and monitoring product performance.

## 1. Addressing new market needs across disciplines

With society's needs evolving quickly, the challenges and opportunities for the chemical industry are also changing rapidly. Products suitable for reuse and recycling are critical for a »circular economy« that can thrive with limited resources, and replacements for harmful substances are required to respond to continuously evolving regulations and stakeholder expectations.

Chemical processes must improve their tolerance of fluctuations in the quality of raw materials to allow the reuse of waste products and the increasing use of bio-based raw materials in production. In addition, the industry needs more options to run chemical processes with highest resource efficiency and lowest energy consumption. Achieving this requires strong interdisciplinary collaboration. In particular, insights from classical chemistry and biotechnology need to be combined with catalysis and process technology to provide the basis for product and process innovation.



**Clariant's sugar-based,** innovative Glucamide product platform was awarded the ICIS Surfactants Award 2017.

## 2. Focusing on four platforms

Clariant's Research and Development activities are aligned closely with these shifting market needs. They are bundled in the centralized department Group Technology & Innovation and structured along four Technology Platforms: Chemistry & Materials, Biotechnology, Catalysis, and Process Technology.

→ FIGURE 001

The Technology Platform Chemistry & Materials combines all activities of Chemical Research and serves as an ideal platform for transferring knowledge between application areas. The renewable, sugar-based Glucamide product platform, which was first applied in the Home Care field, is a perfect example. This platform has since been extended into Personal Care and Crop Protection as well as Oil & Mining applications, for example in chemically enhanced oil recovery. As a recognition of its multidisciplinary character, Clariant's Glucamide Technology was awarded the **ICIS Surfactants Award 2017 for product innovation.**

The Biotechnology platform's tailor-made processes for creating sustainable, bio-based chemicals and bio-fuels also has tremendous potential for cross-product application. In 2017, the start-up project Biofuels & Derivatives took significant steps to commercialize Clariant's sunliquid® technology, which converts agricultural residues into cellulosic ethanol.

# 125

Clariant was engaged in more than 125 scientific collaborations during the course of 2017.

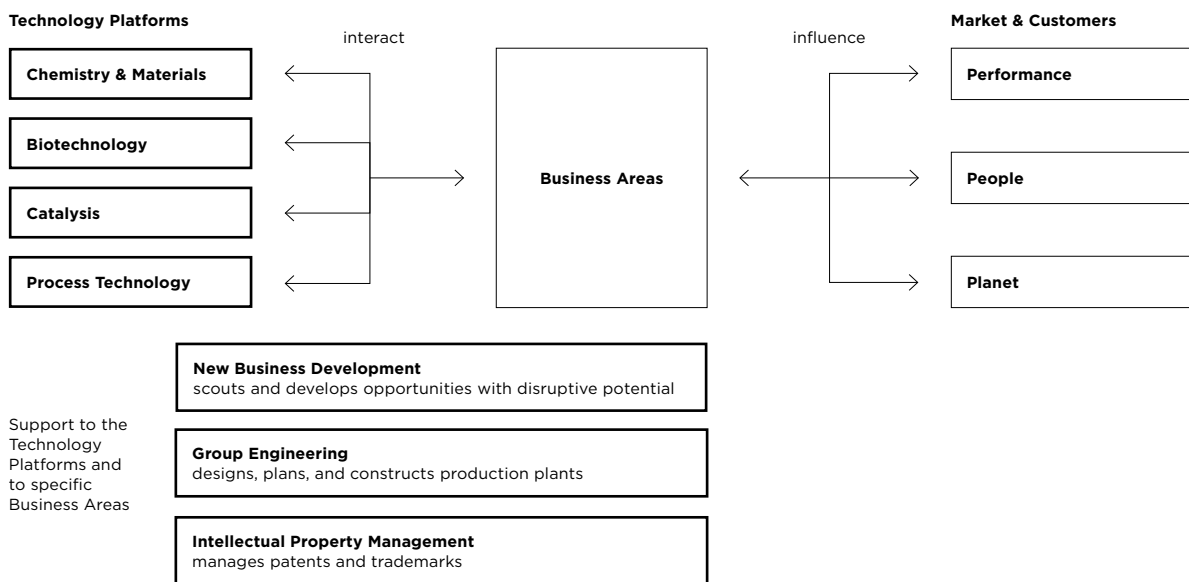
The advanced biofuel reduces greenhouse gas emissions by 95 %, which has generated interest among governments. China, for example, announced the objective of using bioethanol-gasoline blend nationwide by 2020. The government plans to build several demonstration facilities that will be able to produce cellulosic ethanol at an industrial scale.

Clariant signed its first licensing agreement for sunliquid® with Enviral, the largest producer of bioethanol in Slovakia, which will produce 50 000 tons of cellulosic ethanol annually. Furthermore, Clariant invested in a new full-scale commercial plant to produce cellulosic ethanol in Romania. The flagship site underlines the

competitiveness and sustainability of the technology and supports Clariant’s sunliquid® licensing business strategy.

Research and Development in the Technology Platform Catalysis builds on strong external technology partners to derive optimal solutions. For example, in the cross-industry renewable energy Kopernikus initiative, led by the German Federal Ministry of Education and Research (BMBF), Clariant designs catalysts for the LOHC (Liquid Organic Hydrogen Carriers) technology. Another example of the more than **125 scientific collaborations** that Clariant engaged in during the course of 2017 is MuniCat, the Munich Catalysis Alliance between

001 CLARIANT INNOVATION CHAIN



# 2.5

**Growth through innovation** amounted to 2.5 % of the overall growth of the company. The growth rate contains the contribution to growth from both Top Line Innovation as well as Life Cycle Innovation. Potential cannibalization of existing sales caused by Life Cycle Innovation in cases has not been excluded from calculation.

Clariant and the Technical University of Munich (TUM), which is rooted in a long tradition of joint research projects on industrial catalysis. For more information about MuniCat, please refer to the story »Boosting innovations«. → **PAGE 90**

For all innovations, developing state-of-the-art and highly sustainable processes is crucial to bring them to scale. The Process Technology Platform enables the application of new technologies, such as micro-reactor technology or digitalization for self-learning automated data analytics, which allows real-time optimization of production plants all over the world.

### **3. Combining technology push and market pull**

Group Technology & Innovation (GTI) and the Business Units collaborate closely. Some of the ideas for fulfilling unmet market needs are born in GTI's research and development labs and then tested extensively in the application development labs of the Business Units. Other innovations are driven by the Business Units' links to their markets and their collaborations with customers on new product requirements, providing the

basis for GTI's chemists to synthesize new products. Technology push and market pull play hand in hand until application development experts can select the most promising product for further evaluation by customers.

### **4. Building on a strong base**

New Business Development, Group Engineering, and Intellectual Property Management are essential to support all innovations. New Business Development identifies and develops new business opportunities beyond the scope of Clariant's current Business Units. In addition, it incubates new businesses. Currently the new businesses developed are Food Ingredients, Electronic Materials, Additive Manufacturing, and Encapsulation Technology. Geared by a deep understanding of natural ingredients and systems at highest quality standards, Food Ingredients offers tailor-made solutions for the food and beverage industry. Electronic Materials creates sustainable solutions for electronics manufacturing, such as PRELECT® TPS Nano Silver Conductive Inks, which make direct printing of conductive patterns possible on almost any surface. In the

# 6600

At the end of 2017 Clariant held  
6600 patents and 8300 trademarks.

fast-changing additive manufacturing market, the new Clariant 3D Printing business leverages the company's numerous years of experience in tailoring polymers for a broad range of end market applications to provide high-grade, 3D printer filaments and specially made solutions. Encapsulation Technology provides an innovative, robust, and low-cost technology, which helps to protect both oil as well as water soluble active ingredients from oxygen and light degradation as demonstrated with Vitispheres® encapsulated active ingredients. → PAGE 75

One of the initiatives that New Business Development manages is **Open Innovation**. The Open Innovation team identifies collaboration partners, ranging from large corporations to small start-ups and universities. It supports all business units in connecting with external partners around the world. In 2017, the Open Innovation team was expanded to Shanghai to capitalize on business opportunities in Asia.

During the development of processes to manufacture new products, Group Engineering – an internal center of excellence – designs, plans, and executes capital investment projects, and commissions new chemical production plants and site infrastructures. Their Competence Centers ensure best practices across all units, e.g. in environmental technologies or energy management.

Product development also involves Intellectual Property Management, which maximizes the global value of technology and innovation by providing crucial information to the Innovation Community within Clariant and strategically managing Clariant's **6 600 patents and 8 300 trademarks**.

## 5. Progressing through clear stage gates

Clariant Innovation Excellence (CIX) supports growth by ensuring that innovation projects are managed according to Clariant's Idea-to-Market process. CIX provides an elaborate toolbox that allowed Clariant to work effectively on more than **370 innovation projects** (Class 1 and Class 2) in 2017 alone. This toolbox supports ideation to address unmet market and customer needs, developing business opportunities and efficient execution of innovation projects.

This innovation process is structured with a stage-gate process. The stage-gate process ensures the quality of new product and process development projects by checking all new projects at critical stages of development called gates. At the gates the projects are reviewed for attractiveness, plausibility/risk, and completeness in regards of requirements for the respective stage within the five project dimensions: market, unmet need, offering, business case and project management.

## 6. Leading innovation projects to success

Six criteria regarding expected benefit and costs, complexity, and strategic relevance determine how a project is classified and managed.

The most business-relevant innovation projects in 2017, categorized as Class 1, were led by Clariant's 17 Innovation Black Belts who typically dedicate all their time to managing two to three Class 1 projects. Read more about the daily work of an Innovation Black Belt. → PAGE 102 Class 2 and Class 3 projects were led by the 250 Innovation Green Belts or by trained Class 3 project leaders. → FIGURE 002 For these two groups, project management represents approximately 20 to 30 % of their work. The five dedicated Innovation Master Black Belts support the so-called Innovation Champions in innovation

# > 370

**272 specially trained** Innovation Belts and project leaders managed over 370 innovation projects, including 65 Class 1 projects.



**Open Innovation**  
[clariant.com/  
open-innovation](http://clariant.com/open-innovation)



»Scientific collaborations are ensuring the connection to cutting-edge technologies.«

**Martin Vollmer**  
Chief Technology Officer, Head of Group Technology & Innovation

portfolio management and coach project teams to manage projects in such a way that uncertainty is reduced along the way. The Innovation Champions are responsible for coordinating the stage-gate review execution and reporting the innovation status-quo to the Innovation Portfolio Committee, among other duties.



**VERITRAX™**  
The pioneering digital system increases production efficiency in the oil and gas fields.

**7. Integrating sustainability throughout**

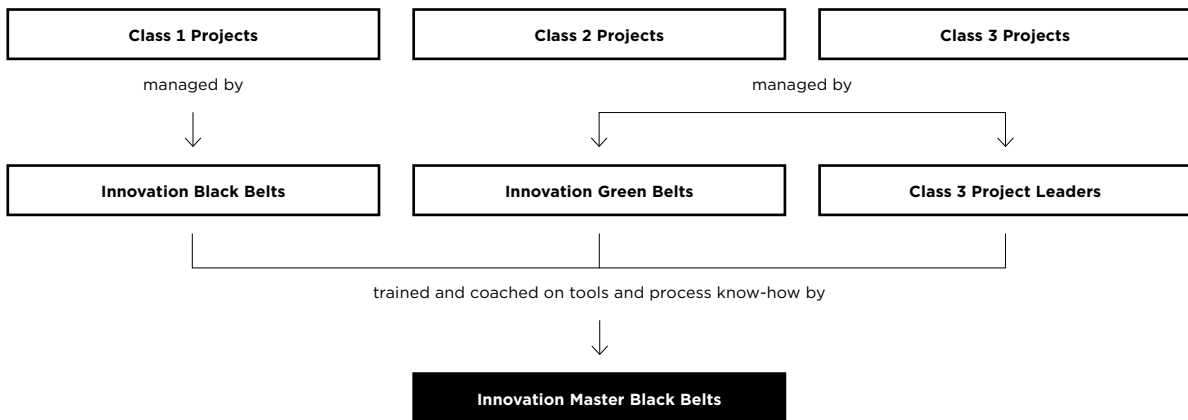
At Clariant, sustainability fuels innovation and New Business Development. Particular sustainability challenges that our society is facing can also lead to new ideas for project or product development and business scouting. For this purpose, Sustainability Trend meetings are held several times a year at global, and in the future at regional levels, in order to scrutinize challenges from different business and geographic perspectives and evaluate potential ways of addressing them using Clariant’s expertise in chemistry and material science. In addition, every innovation project is screened for sustainability aspects. Sustainability is not just the goal of certain innovation projects but a fundamental prerequisite for all new solutions under

development. To harmonize screening for innovation projects with screening for existing products, previously separate Corporate Sustainability Assessments for innovations were integrated into the Clariant Portfolio Value Program in 2017. The innovation project pipeline is thus being screened according to the same sustainability criteria valid for the entire product portfolio under the PVP.

**8. Digitalization as enabler**

Increasing digitalization enables – and in some cases demands – new business models. For example, Clariant has taken a pioneering role with its **VERITRAX™** solution, which offers oil and gas producers significant improvements in operating efficiencies and uptime through automatic chemical control, monitoring, and ordering. VERITRAX™ was nominated for the ChemE »Process Safety Award 2017«, the 2017 World Oil Awards »Best Data Management & Application Solution Award«, the ICIS 2017 Innovation Awards »Best Process Innovation«, and the TOTAL Supplier Awards in the category »Innovation/The Digital Wave«. → **PAGE 97**

002 INNOVATION PROJECTS: CLASSIFICATION AND MANAGEMENT



## Performance

### INPUT

 **211**  
R&D spend in CHF m  
(3.3 % of Group sales)

 **> 125**  
Scientific Collaborations

 **> 370**  
Active Innovation Projects  
(Class 1 and 2)

 **8**  
R&D Centers

 **> 50**  
Technical Centers

### OUTPUT


 **6 600**  
Patents at year end

 **2.5 %**  
Growth through Innovation<sup>1</sup>


## People

### INPUT

 **~ 1100**  
Employees in R&D

 **9 522**  
Training hours in Group  
Technology & Innovation







### OUTPUT

 **272**  
Employees with Innovation Belts  
(250 Green Belts, 17 Black Belts and 5  
Master Black Belts)

## Planet

### INPUT

### OUTPUT

-  Financial capital
-  Intellectual capital
-  Manufactured capital
-  Human capital
-  Relationship capital
-  Natural capital

<sup>1</sup> Contains the contribution to growth from both Top Line Innovation as well as Life Cycle Innovation. Potential cannibalization of existing sales caused by Life Cycle Innovation in certain cases has not been excluded from calculation.



**Peter Baur**  
Head of Competence Center  
Crop Solutions

A photograph of Peter Baur, an older man with thinning hair, wearing a dark brown jacket over a light blue button-down shirt. He is standing in a greenhouse, smiling slightly. He is surrounded by rows of blue trays containing lush green grass-like plants. The greenhouse has large windows in the background with a grid pattern, and several white grow lights are hanging from the ceiling. The overall scene is bright and professional.

# Growing Ambitions

# 400

The total size of the new greenhouse in the Clariant Innovation Center (CIC) in Frankfurt-Höchst is 400 sqm.

## A team of researchers and their highly specialized greenhouse are changing the way we use crop protection.

Frankfurt is a long way from the highlands of Guatemala. For Javier Campos, the journey took six years. Back in 2010, the young Spaniard was working for the United Nations Development Program, helping local subsistence farmers in one of the most mountainous countries of Central America improve their harvests. He had just finished his studies in agronomy at a Danish university and was eager to put his knowledge to use. »Our aim in Guatemala was to show how terraced fields could decrease both erosion and surface runoff«, he explains. »Local farmers had been struggling for centuries with rain quite literally washing away the fruits of their labor.« In a broader sense, six years, further studies in Spain and a few stints at bioresearch companies later, he is now working on his Ph.D. to deal with a similar issue. Only this time, he controls the weather.

At the Clariant Innovation Center in Frankfurt-Höchst, Campos and his colleague Peter Mansour are putting the final touches on a very special greenhouse. They prefer the term »phytotron«. It's an enclosed research greenhouse that allows them to control almost every aspect of a plant's life. »We control the soil, the temperature as well as the amount of rain, wind, light, and humidity the plant is exposed to«, says Mansour. The chemical lab technician has spent his whole career optimizing crop protection and fertilizers. Clariant produces neither. But the company is a global player in additives and adjuvants – chemicals that make herbicides, pesticides, fungicides and fertilizers more effective.

These are what Mansour and Campos will be testing, but they're already adding new tricks to Clariant's toolbox.

One essential part of the greenhouse is called »moving fields«. Here, dozens of small crates with plants growing in them move on a system of conveyor belts. Together with a robotic arm, this system takes them through a fully automated routine set by a computer. The plants are weighed, rinsed, sprayed with different combinations of crop protection products or fertilizers, buzzed with UV-light and examined by a set of two 3D laser scanners. They measure everything from the color of the leaves to the thickness of the stems, the angle at which the leaves grow, down to their exact chemical makeup. »Many of the solutions we develop help plants deal with certain types of stress«, Campos explains. Which in turn means that he and his colleagues will not be coddling their test specimens. »If anything, we'll be inducing stress, be it from lack of water or certain wavelengths of light, from strong wind, certain mineral deficiencies or pests and fungi.«

The greenhouse itself is divided into three sections which broadly represent three principal areas of research: bioherbicides, foliar fertilizers, and plant growth regulators, or PGRs. »None of these are themselves entirely new. But the way we aim to combine them, and our approach in experimenting with these combinations are pretty unheard of in the industry«, says Prof. Peter Baur. He is the head of Clariant's Competence Center for Crop Solutions and Global Application Development. Baur joined the company in 2011. He has worked in crop science for decades and still teaches phytobiology at the Leibniz University of Hannover. He's a busy man. And talking to him about his work is like trying to take a sip from a firehose. Baur quickly



# »Farmers have been struggling for centuries with rain literally washing away the fruits of their labor.«

**Javier Campos**

Application Development Manager

delves deep into biochemical mechanisms just to then draw macroeconomic conclusions about how a sturdier stem in rice, for example, could translate to higher yields, which in turn could help deal with hunger, growing populations, and climate change. All the while his phone rings and lab researchers pop their heads in the door hoping to get his take on their latest data.

The global market in agricultural chemicals is worth well over USD 200 billion today and is by some estimates projected to grow beyond USD 300 billion within a decade. Clariant is an important supplier to the industry. But its operations are tiny compared to some of the global agrochemical giants. The fact that Clariant hired a renowned plant specialist like Baur and is now researching crop solutions at such a fundamental level is remarkable in itself. Clariant produces mostly additives that help formulate crop protection products and fertilizers. Some simply help emulsify or disperse the active ingredients in a liquid formulation. Others make them stick to the plant so they're not blown or washed away. The list goes on quite a bit, but Baur wants to do more. »I know that we can add more value and develop sustainable solutions to feed more people«, he says. Baur sees nothing less than another green revolution akin to those of the beginning and middle of the last century, which helped feed an ever-growing population. »This time we could do it while also addressing climate change«, he says. He hopes to contribute by focusing on areas of crop protection that – in his mind – have been neglected so far.

Plant growth regulators are one such area. These are substances naturally found in plants that – as the name

suggests – regulate how fast, tall or sturdy a plant grows. Exposing a crop to them at certain stages of its growth cycle allows you to control desired properties. Achieving a shorter but sturdier stem, for example, might help with lodging, a widespread problem in top-heavy crops like wheat, corn or rice. Come harvest season, they can tip over, making them hard to harvest and more susceptible to mold. »We have known about these PGRs since the 1960s and 70s«, says Baur. »But the majority aren't used or even well understood in agriculture. Which is a shame because they're completely natural and can help solve a great number of problems.« How PGRs work, how they should be applied and which crops could benefit most is a central part of Baur's research. In fact, about half the capacity of the greenhouse is devoted to it, with many different species being tested. Pointing to a few crates in the back, Baur urges that none be mentioned specifically. »We're venturing into some new crops, and I wouldn't want to tip off the competition.«

Bioherbicides are another field of interest. They're also a growing market. »These are substances also found in nature that can target specific weeds but have so far not been used to their full potential«, says Baur. Clariant tests tailored combinations of various bioherbicides together with adjuvants that improve their effect. A section of the greenhouse in Frankfurt is filled with rows of weeds wilting away to different degrees. »We work out the optimal combination that effectively combats a whole number of problematic weeds while leaving the crops healthy«, says Peter Mansour, pointing out rows in which several different weeds have evidently been hit hardest. Invasive new weeds and acquired resistances

## 120

**To replicate fog** and conditions of high humidity, 120 high-pressure fog nozzles have been installed in the greenhouse.



#### Moving fields

A robotic arm and a system of conveyor belts take the plants through an automated routine within the greenhouse.



**»We control the soil, the temperature as well as the amount of rain, wind, light, and humidity.«**

**Peter Mansour**  
Lab Technician

can make crop protection become an arms race, but as Prof. Baur explains, bioherbicides are harder for weeds to avoid: »Some of these natural chemicals are vital to a weed's metabolism. So there's no real way for it around them.« Plus, as nonsynthetic natural alternatives, bioherbicides are welcomed by a public that is more and more concerned about the chemicals used in agriculture. Foliar fertilizers are the third area of research Baur hopes to drive forward. These are fertilizers that are absorbed not by the roots but rather through the leaves.

This may yet turn out to be the most important research because it could provide new ways of getting fertilizers, bioherbicides and growth regulators into the plants a lot more efficiently. »We can already feed a plant certain micronutrients directly through its leaves«, says Baur. »Imagine a plant lacking in manganese, for example, an element that plays an important role in photosynthesis. If we introduce this nutrient to the soil, most of it forms complex bonds there and becomes unavailable to the plant. Feeding manganese straight into the leaves avoids



**Stephanie Giessler**  
Application Development  
Manager

this. So we can give the plant exactly what it needs without much waste.« Baur foresees a future in which plants are fed even more complex molecules such as vitamins, amino acids, and proteins. That, he hopes, might usher in a green revolution of crops with completely new nutritional value. Think of common cereals becoming new super foods that could tackle any number of deficiencies or malnutrition in populations that rely on one staple crop. »All this without ever meddling with genetically modified organisms«, as Baur explains.

Understanding how to get anything first onto and then into the leaves effectively is something that Baur's team has been working on for a few years now. While foliar fertilizers are also tested in the greenhouse, the neces-

sary lab work is mostly done in the much larger building towering right next door. The Clariant Innovation Center or CIC is the company's flagship in research and development. It was opened in 2013 in one of Germany's largest industrial parks on the outskirts of Frankfurt. A total of 500 people work here in research and development for all Business Units under Clariant's roof. Walking through a vast atrium, visitors notice a constant hum and whisper. On every floor, bright young minds are gathered around coffee makers, sofas or whiteboards, discussing ideas, lab results and probably plans for the weekend. Corridors of highly specialized labs lead away on every floor. One of those corridors on the third floor as well as the roughly 20 researchers inside are dedicated to crop solutions. The work here isn't always very

# 36 000 000

The total area of the Clariant Innovation Center is 36 000 sqm, more than a third of which is taken up by laboratories.

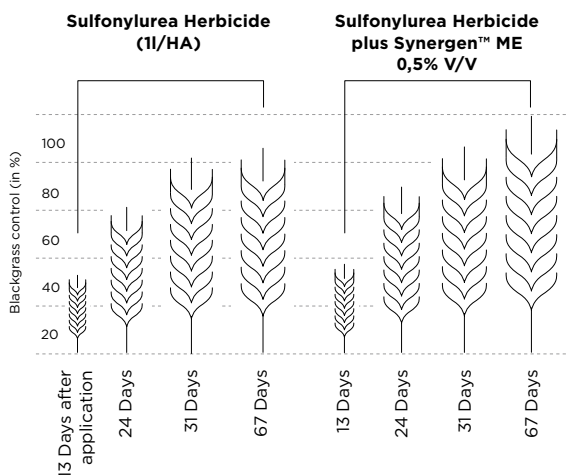
glamorous or even exciting. Whenever they're not generating or analyzing data, the lab researchers punch out thousands of coin-sized disks from leaves. These are then partially dissolved to isolate the top protective layer, the cuticle, before being individually set out by hand to dry. »Whatever we want to get into the leaf has to permeate the cuticle«, explains Stephanie Giessler, one of the leading researchers here. »So we test arrays of hundreds of these at a time, and we have to check every disk for holes as well. Any tiny scratch or even a bite mark from an aphid could mess up the results.« Thankfully, quantifying how much of the desired substance went through each disk and how fast is an automated process developed by Clariant.

Two doors down, the equipment is decidedly more sophisticated. An electron microscope coupled with something called energy-dispersive X-ray spectroscopy shows in mind-boggling detail how and where individual particles of certain minerals have settled onto plant cells. »This shows us for example whether a nutrient we've sprayed has spread evenly or whether it accumulated in certain areas«, Giessler explains showing an image of the so-called coffee-ring effect. »Without our surfactants, most solutions would form these rings at the edge of any dried up droplet.« Another test uses  $^{14}\text{C}$ , a special radioactive carbon isotope, to label specific fertilizer molecules and show how they've moved through the plant and where they've reached. In a hermetically sealed chamber further along, Giessler and her colleagues even test how the speed of the tractor spraying the fertilizer and the type of nozzle used may affect the application. High speed cameras show how individual droplets either bounce off or adhere to the plant. All in the name of making future crop solutions more efficient. »It's what we've set out to do«, says Baur. »Whereas much of the agrochemical industry still follows what I



#### INCREASING WEED CONTROL

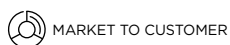
Synergen™ ME significantly improved the field performance of a leading sulfonylurea herbicide. In a field trial carried out on wheat, no crop tolerance issues were observed in any of the four replicates. This tank mix adjuvant was able to further enhance the fully adjuvanted sulfonylurea formulation.



like to call 'spray and pray', we here at Clariant want to figure out precisely what works and how in order to tweak our solutions and come up with brand new ones.« He strives to emulate companies like Bosch, a German engineering firm and the world's largest supplier of automotive components. »From spark plugs to traction control systems, it's mostly their innovations that allow car companies to continuously improve safety, efficiency and ease of use«, he says. »Similarly, we want to be the number one driving force behind innovation in the agrochemical industry.« That's ambitious. But if he succeeds, today's work by the likes of Javier Campos might soon help farmers improve their harvests and indeed feed a growing population all over the world.

# Market to Customer

**Clariant strives to understand customer needs along the entire value chain, develop solutions that address those needs, and capture the value created for profitable growth. Clariant Commercial Excellence helps the Business Units translate their strategy into actionable growth plans and continuously improve customer engagement and sales operations through ongoing dialog with customers and partners.**



MARKET TO CUSTOMER

**Market to Customer** includes identifying market attractiveness, developing a clear value proposition and articulating it to the customers, and capturing the value created through relationship building and the sales process.

## 1. Understanding customer needs - responding to market pressures

In recent years, a strong competitive and pricing pressure has developed in the specialty chemicals industry, mainly due to overcapacity created in Asia combined with a lack of innovation. This has resulted in a growing trend toward commoditization. In addition, the continuing increase and volatility in raw material prices has created margin pressure for Clariant's Business Units. This uncertain business environment requires that Clariant pays close attention to cost and supply chain competitiveness on one hand, while having a clear focus on sales growth on the other.

Looking through a »customer lens« allows Clariant to understand changing needs for products and services, as well as the customers' perception of Clariant, from the initial interaction to the purchase decision. For example, Clariant meets the increasing demand for materials and processes that address sustainability issues with its **EcoTain® Label**. This designation is awarded to sustainability excellence products and solutions that offer best-in-class performance. It sets an ambitious benchmark and distinguishes itself by exceeding market standards while considering the overall benefits and impacts across the entire life cycle, and contributing overall to the sustainability efforts of the company and customers. To earn this label, the products undergo a systematic screening process using



ECOTAIN®

**The flagship label for sustainable products**  
At the end of 2017, 169 products carried the EcoTain® label for sustainability excellence. [clariant.com/ecotain](http://clariant.com/ecotain)

social, environmental, and economic criteria. A corporate panel comprised of Corporate Sustainability & Regulatory Affairs, Group Technology & Innovation and Group Communications, with particular guest experts from Product Stewardship depending on product application, scrutinize each product and solution in order to ensure that the EcoTain® label requirements are upheld. At the end of 2017, a total of 169 products were awarded EcoTain®.

## 2. Interacting with customers along the digital innovation cycle

To systematically explore and capitalize on the opportunities of digitalization for all of Clariant's Business Units and value creation phases, including the Market to Customer processes, Digital4Clariant was launched in 2017. One of the workstreams of the initiative encompasses the development of digital business models to explore new markets and spur growth. → **FIGURE 001**

In 2017, three Business Units applied the rapid innovation method, which is widely used in the technology sector and consists of an innovation and incubation phase prior to commercialization. To guarantee new solutions satisfy customer needs, Clariant works closely with its customers. In the innovation phase, typically ethnographic interviews are conducted to explore customer needs. During the incubation phase, the number of customers that are willing to test a product or service provides further insights into the solutions' desirability and the customers' willingness to pay. This allows Clariant to focus on the most promising projects.

## 3. Designing a »Leading Marketing Organization«

Clariant's Marketing Excellence Initiatives play a key role in driving value creation. These programs have

»We used the marketing excellence methodology to target the customer segments with the highest potential to win market share and grow our business in our key strategic segment of plastics in China.«

**Alexandre Baron**  
Regional Business Line Head Business Unit  
Pigments, Asia-Pacific region

developed into an essential building block for finding and capturing growth opportunities by providing the methodology to assess overall market attractiveness and identify profitable market opportunities and customer segments. Since 2015, overall growth benefits from 60 Marketing Excellence projects accounted for more than CHF 26 million in additional margin.

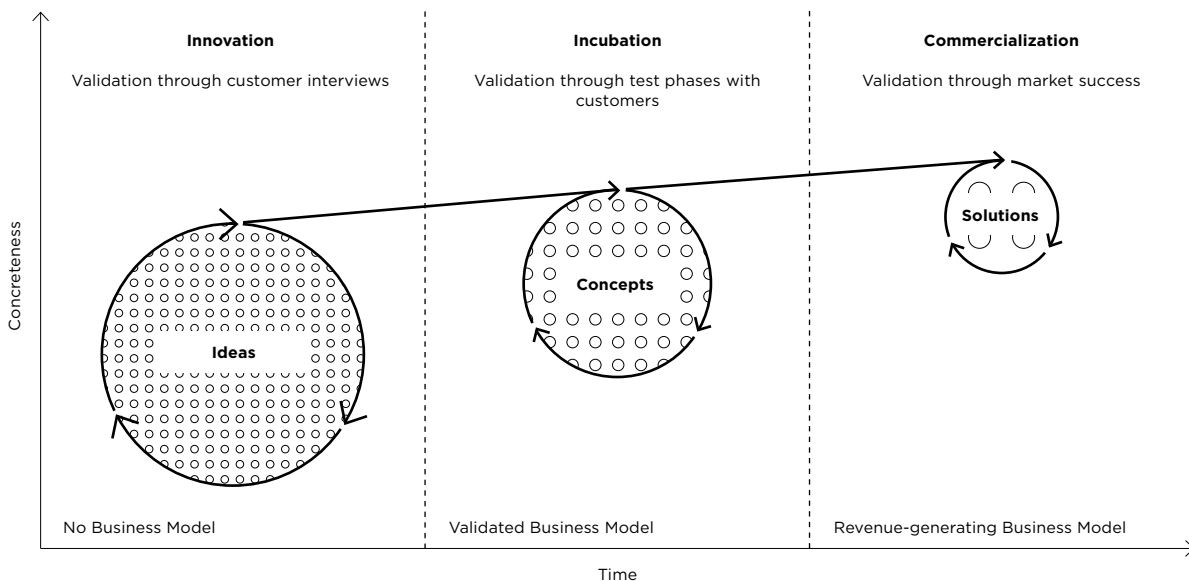
Based on this success, in 2017 Clariant launched the initiative »Leading Marketing Organization«. → PAGE 56 This project aims to further anchor marketing within the Business Units and transition from a project-based approach to true customer-centricity. Commercial Excellence worked with the Business Units to develop these Marketing Organizations with tailored structures,

highly skilled people, and clear responsibilities in place. In November 2017, all Business Units presented their operating models in the Objective Discussion, including capability-building activities for the marketing organization, and subsequently began implementation.

**4. Translating customer needs into compelling value propositions**

In line with its clear customer focus, Clariant’s ambition is to create strong, customer-oriented value propositions. The Marketing Excellence Foundation Training helps Clariant’s commercial organizations develop tailored value propositions that not only target the specific customer segment, but also the respective decision maker in the buying process. Furthermore, Commercial

001 DIGITAL INNOVATION CYCLE





Black Belts and representatives from Business Units took part in a training on the newly introduced Value Proposition Canvas. It allows for an easier identification of the customers' »jobs to be done«, as well as the associated pains and gains, and supports Clariant's ability to differentiate offerings accordingly. It thereby increases business-winning opportunities and positively impacts Clariant's market share gains.

This has been a vital focus, most of all in the fast-growing markets such as the Asia-Pacific region, where business opportunities are large. In 2017, after facing declining sales in previous years, Clariant's Pigments Unit in China applied the marketing excellence methodology to assess the overall market attractiveness and run a needs-based customer segmentation. In-depth interviews with customers, industry experts, and potential leads helped clarify the customers' buying process and develop customer-focused, compelling value propositions.

#### 5. Demonstrating additional value

To reap the fruits of improved value propositions, strengthening the ability of Clariant's account managers is imperative to better understand customers' needs and demonstrate the value of Clariant's products. Usually, this articulation of the additional value that Clariant products offer happens in comparison to the second-best alternative – a process that is supported by Clariant's value calculator. In the future, the systematic roll-out of a value-based selling approach is expected to drive profitability, particularly in conjunction with Clariant's new Pricing Excellence Initiative. This initiative focuses on the Value Stream Design of Clariant's pricing process and on a more transparent, faster, and more effective way of pricing execution in the end market. This is based on a change in raw material costing due to the increase and high volatility of prices, which has put margin pressure on the Business Units since 2016.

To strengthen Clariant's sales capabilities, its 80 best regional sales managers completed a specific sales training in 2016 – 2017. The focus of the training was identifying growth opportunities, improving value propositions, channel management, and pricing. Each participant was required to design and drive a major growth project. The projects were then presented to a member of the Executive Committee during the training and are followed up on regularly.

#### 6. Leveraging customer satisfaction for continuous improvement

Customer engagement is the core of Clariant's commercial strategy and the key to profitable growth. Clariant Commercial Excellence emphasizes continuous improvement in customer engagement and sales operations through ongoing dialog with existing customers, new prospects, and other partners along the value chain. In 2016, Clariant undertook its biannual customer satisfaction survey and received feedback from more than 2500 customer contacts. The results revealed that Clariant had gained a reputation as an »innovative solution provider« and improved its net promoter score to 37%. Clariant has taken the results of this survey as a means to improve customer engagement in 2017.

As part of all Commercial Excellence projects, Clariant conducted **515 customer interviews** and 59 interviews with industry experts in 2017. In addition, customers completed scorecards to evaluate Clariant's performance compared to competitors. The gained insights guide both Clariant's commercial and innovation activities.

# 515

Interviews with 515 customers provided valuable insights.

## Performance

### INPUT

 **34**  
Marketing Excellence projects

### OUTPUT

 **12.3**  
Additional margin in CHF m  
from Marketing Excellence projects


 **169**  
EcoTain® products at the  
end of 2017

## People

### INPUT

 **515**  
Customer interviews in Marketing  
Excellence initiatives

 **80**  
Sales managers participated in  
a specific sales training

 **59**  
Industry experts interviewed

### OUTPUT

## Planet

### INPUT

### OUTPUT

# Marketing Advances

## Harald Dialer, Head of Clariant Excellence, explains how and why Clariant seeks to fundamentally change its approach to marketing.

**Mr. Dialer, Clariant has set out to establish a »Leading Marketing Organization«. What does that actually mean?**

**HARALD DIALER:** We strongly believe that having the edge in marketing will be a key factor when it comes to our organic growth going forward. That's why we're fundamentally rethinking our approach to marketing across all of our Business Units.

**What's wrong with Clariant's marketing as it is?**

As a company we have always been focused on staying ahead of the curve, for example in terms of most efficient processes, our cost positions and especially in innovation and new solutions. Marketing as an institutionalized discipline has not had the same overall strategic focus or impact.

**What needs to change?**

Marketing at Clariant in most cases used to be a scattered service and more of a support function. As such it lacked dedicated resources and clear ownership of the growth pipeline. To put it bluntly, marketing had no seat at the table when it came to strategic decisions. That is about to change – in line with our aspiration to continuously improve and change the way we operate.

**Is the problem you're describing unique to Clariant?**

Absolutely not. Most B2B suppliers, especially in the chemical industry, have for decades mostly ignored

developments in modern marketing. Understandably so. Our business relies heavily on advanced technology and huge assets. So the belief was: »If we build it, they will come.« And for the most part it worked. But we can do a lot better.

**How do you know?**

We're not really starting from scratch. As part of an earlier initiative, we've completed well over 50 individual projects in what we termed Marketing Excellence. We did this together with commercial teams across all Business Units. These projects have all been very successful. By most recent estimates, they've added **CHF 12.3 million** of contribution margin in 2017 alone, with an even stronger growth pipeline going forward. The fact that we've since been overrun with requests for further projects shows that the Business Units are all eager to further step up their game in marketing. But it also makes sense not to do that on a project-by-project basis. We need to anchor marketing capabilities in the Business Units.

**How do you go about turning marketing into a strategic function?**

First of all, by simply establishing dedicated marketing functions that have the necessary empowerment and resources. There will not be sales people doing ten percent marketing on the side. More importantly, we're putting marketing in the driver's seat. The management committee of every single Business Unit will have a Head of Marketing either as new member or standing invitee on it.

**Why is that important?**

Marketing, if done right, delivers customer insights along the value chain that drive and challenge the current strategies of our businesses. Marketing will help us make unique value propositions and identify white spaces in

A professional portrait of Harald Dialer, a middle-aged man with light brown hair, wearing a dark blue suit, white shirt, and a patterned tie. He is standing with his hands clasped in front of him, looking slightly to the right of the camera with a subtle smile. The background is a plain, light grey.

# 12.3

**Recent Marketing Excellence** projects led to an added contribution margin of CHF 12.3 million in 2017.

**Harald Dialer**  
Head of Clariant Excellence



»We've generated profitable growth through individual marketing projects. Now we're anchoring marketing organizationally across all Business Units more deeply to reap even bigger rewards.«

**Britta Fuenfstueck**  
Member of the Executive Committee

our portfolio where Clariant might excel with new solutions. That will in turn influence how we fill our innovation pipeline. In fact, in some Business Units, such as Functional Minerals, the Head of Marketing will also be the Head of Innovation.

**Can you point to success stories where innovation and marketing have gone hand in hand?**

In a sense, any successful launch has to be the result of innovation and marketing working closely together. Take VERITRAX™ for example, a groundbreaking combination of digital hardware and software that Clariant launched in 2016. It's the first intelligent chemical man-

agement system of its kind, offering oil and gas producers a fully transparent, automatic solution for chemical control, monitoring and ordering. Clearly, the folks at Clariant who came up with it had a very good idea of what our customers in the industry might need – well beyond our chemical products themselves. They also had the know-how to come up with a solution that's both pioneering and perfectly practical. To me, that shows how marketing intelligence, a strict customer focus and innovation can create the kind of new and profitable business opportunities that go beyond retention.

# 100

The »Leading Marketing Organization« will create approximately 100 additional jobs by 2020.

## What are some of the new functions you're adding?

We're adding a whole set of specific functions and methodologies. Differentiating and professionalizing certain tasks is a vital part of this modern approach to marketing. Just as an example, we are hiring specialists in pricing and setting up dedicated teams for marketing intelligence — both functions that, when done right, have a key relevance for profitable growth.

## What's the aim in pricing?

To use all the relevant tools available today and to ensure efficient execution of pricing decisions in the market. Methods of big data-enabled pricing, for example, can help reveal order patterns that correlate to certain price points. This allows predictions about customer behavior and could let us segment our customer base more accurately and proactively instead of just looking back and analyzing who bought what. Marketing intelligence will do the same on a much broader scale. Some of our Business Units operate in markets that we hope to not only understand better, but to also actively shape ourselves. Business Units like Catalysts and Industrial & Consumer Specialties have been doing this in part already. But discerning trends and behaviors both upstream and downstream is becoming more and more relevant to all our operations. The same goes for digital solutions and new business models.

## How will your »Leading Marketing Organization« help drive the digital transformation?

New digital channels, e-commerce, track-and-trace logistics, even social networks and what some are calling the »Amazon-ification« of B2B industries all affect how and what we sell. It's marketing specialists that will help us lead the way on all these fronts.

## With these methodologies being fairly new to the chemical industry, are you looking at other industries for guidance?

It's important that our approach fits the needs of our businesses. There's never a one-size-fits-all solution. That's why we've worked very hard at tailoring our setup to each and every Business Unit individually in line with the specifics of their industrial environment and global markets. But of course there are other industries that we may learn from. In terms of pricing, airlines and their data-driven dynamic pricing come to mind. We certainly won't emulate this to the same extent. However, there's definitely a lot to learn about optimizing capacity utilization and leveraging customer

value. In fact, one of our most recent hires is a data specialist who has worked on optimized price-setting methods based on statistical market research techniques and big data in the airline and public transportation sector.

## Speaking of hiring, how many new jobs are you creating in marketing?

We're currently looking at around **a hundred new positions** being created through 2020. However, we're not just adding quantity but also a specific quality of jobs. We're opening brand new company-wide career paths that just weren't there before. This is massively important both in order to attract and foster talents in this interesting field.

## Where do you find talent?

We're finding it within Clariant, of course. Part of implementing our »Leading Marketing Organization« is establishing our own Advanced Marketing training courses in order to build the necessary knowledge and expertise. We're currently evaluating several international business schools and other external partners to design a tailored curriculum for our employees together with the Clariant Academy. But we're obviously also seeking and hiring specialists from outside Clariant and from other industries, as I mentioned.

## What's the biggest challenge going forward?

The scope of implementing a new common methodology across the whole company is daunting. As is the fact that we're often simultaneously outlining, implementing and filling so many new positions. However, we're carried by the Business Units, who all see the benefit. There's no doubt that these are interesting times to be working in sales and marketing at Clariant.

# Customer to Cash

**Clariant employs a holistic, cross-functional approach to Operational Excellence that strives to optimize the Customer to Cash process along the whole value chain. While the Market to Customer process centers around stimulating growth, the main objective of Operational Excellence is to optimize the end-to-end supply chain by balancing supply and demand, enhancing product availability and simultaneously improving Clariant's supply chain cost situation and risk profile. Planning, procurement, production, and delivery are continuously improved to guarantee on-time, in-full delivery and thus contribute to Clariant's overall profitability.**



CUSTOMER TO CASH

**Customer to Cash** encompasses planning to balance demand and supply, optimizing sourcing for spend effectiveness, constantly monitoring production for high efficiency, and delivering finished goods on-time and in-full as required by the customer.

## 1. Integrating the planning landscape

Strong global competition and increasing customer service requirements, such as short lead times, make holistic management of Customer to Cash processes a prerequisite for business success. To keep up with increasing speed in the industry, Clariant sees digitalization as a great opportunity for making information about the whole value chain more accessible to all departments. This connects the different departments, steers the entire Customer to Cash process from planning to delivery in real time, and enables flexible responses to changing customer needs.

A key building block is the Integrated Planning Landscape (IPL), which was launched in 2015 and rolled out in the Business Units Industrial & Consumer Specialties and Oil & Mining Services in 2017. It enables cost reductions in the planning phase by aligning processes, capabilities, and IT tools. In the Business Unit Additives, where IPL had already been implemented, the »Days' Inventory on Hand« (DOIH) could be reduced by 10 days.

To complement the IPL, Clariant is currently introducing a Process Order Management (POM) tool as part of its Manufacturing Execution System (MES), which provides a real-time view of the status of production. In conjunction with the IPL, this tool will make the whole Customer to Cash process visible, thereby leveraging the ability of Operational Excellence to support Clariant's focus on strategic growth. For more detailed information regarding the Order-to-Cash process see → PAGE 64. Developing more advanced digital solutions to optimize Clariant's operations, for example regarding digital material flows, falls within the scope of responsibility of Digital4Clariant, an initiative that was launched at the end of 2016 and will be further rolled out in 2018.

## 2. Achieving holistic targets

In 2017, Operational Excellence focused on the so-called Mission Approaches. These aim to align the activities of all departments (Clariant Procurement Excellence, Clariant Supply Chain Systems, and Clariant Production Systems) along the value chain, allowing Clariant to overcome silo thinking and achieve holistic targets. The Mission Approaches promote working in cross-department teams and evaluating progress with KPIs from all different functions. This reduces the trade-offs that sometimes exist between optimization efforts in different departments, such as when optimizing batch sizes to reduce change-over led to increased inventories.

The Catalysts site in Louisville, Kentucky, is only one example that illustrates how the Mission Approach breaks silos. Louisville was able to increase first pass quality to 100 % on a historically challenging production line, increase capacities in another production line to

# 2.7

Clariant's spend on raw materials amounted to CHF 2.7 billion in 2017.

achieve a revenue enhancement of CHF 1.2 million, increase transparency of in-process inventories, and improve employee engagement across the site.

### 3. Reducing risks and costs in a large supply chain

Clariant is embedded in an extensive global supply chain. In the reporting year, it purchased **CHF 2.7 billion worth of raw materials** from around 7 000 vendors and approximately CHF 1.8 billion of other products and services, such as technical equipment or energy, from roughly another 25 000 suppliers. Optimizing procurement processes thus has a tremendous impact on Clariant's overall profitability.

In 2017, Clariant Procurement Excellence (CPX) strengthened the application of the procurement excellence methodology, aiming to reduce supply risks and costs as well as improve free cash flow. Raw materials were harmonized wherever possible and the substitution of materials, as well as de-specification, was tested. All three approaches aim at reducing the overall number of different raw materials purchased by Clariant, leading to reduced complexity and a wider supplier

base and ultimately lowering purchase prices. Supply risks are reduced by widening specifications and available sources, which also minimizes the need for high safety stocks and makes inventories more efficient.

Applying the Procurement Excellence methodology allowed Clariant to realize cost savings of roughly CHF 20 million in 2017.

To reduce risk and dependence from suppliers, Clariant developed new relationships, especially in cases where single source situations existed. Furthermore, it conducted workshops with suppliers to look into new business development and innovations that presented win-win situations for both parties.

### 4. Making a difference through cross-functional collaboration

In 2017, the Clariant Production System method was upgraded by designing door-to-door material and information flows along a facility's value chain. This new approach fosters collaboration between different Business Units and thereby accelerates business transformation, as demonstrated by the employees of Clariant's



»The continuous implementation of our blueprints by production units has delivered savings around CHF 40 million, thus assuring that we encounter inflation effects and stay competitive in our costs.«

**Axel Schoenfeld**

Head of Operational Excellence



#### 17 ideas for Suzano

Employees at the production plant in Suzano, Brazil, developed 17 ideas with a revenue enhancement potential of CHF 1.3 million.

production plant in Suzano, Brazil. In a joint workshop, participants from the Business Units Industrial & Consumer Specialties, Oil & Mining Services, and Clariant Procurement Excellence developed measures to increase the ether amine throughput of the sold-out facility by 20%. Using a data-driven analysis, the team derived **17 ideas** that could be implemented within six months without additional investments. Furthermore, these ideas presented a cost-impact and revenue enhancement potential of CHF 1.3 million for both Business Units.

To follow the continuous improvement cycle illustrated above, developing employee competencies is vital. Clariant therefore established the Supply Chain Capability Building Program in 2016 through the IPL rollout, which helped identify knowledge gaps, upgrade functional knowledge, and increase individual performance. In 2017, a structured capability program for both production management and shopfloor has been created as part of the Clariant Production System. It will be launched to strengthen the skills, mindset, and behavior that is needed to drive Clariant's lean transformation process.

#### 5. Enhancing Inventory Health Checks for optimized service quality

Inventory Health Checks are central to determine optimal inventory levels and define inventory targets. Based on dedicated data analysis and market research, improved planning parameters can be fed into the Integrated Planning Landscape, which then drives inventories toward optimal levels. This approach guarantees

a high On-Time, In-Full (OTIF) rate, while simultaneously reducing inventories. The Inventory Health Checks thus result in immediate, positive impacts on cash flow in the Customer to Cash phase.

In 2017, Clariant introduced Inventory Health Checks in large parts of the Business Unit Masterbatches, in two main regions of the Business Unit Industrial & Consumer Specialties, and in new acquisitions of the Oil & Mining Services Business Unit. Operational Excellence is also working with the Business Unit Pigments to introduce the program in Europe. Clariant plans to launch the program in the remaining Business Units in 2018.

#### 6. Guaranteeing safe operations

While the lean process is the engine of continuous improvement, safe production is a prerequisite for the engine to work properly and guarantee Clariant's social, economic, and ecological license to operate. In 2017, the Occupational Health & Safety (OHS) department was working on changing Process Safety Event reporting in all its sites to comply with the requirements of the **International Council of Chemical Association (ICCA)**. Furthermore, OHS rolled out four Safety Leadership Improvement packages to further anchor the topic throughout all hierarchy levels. This will make a vital contribution to reaching Clariant's health and safety target of zero accidents. Thanks to trainings and investments in plant safety, Clariant managed to stabilize the lost time accident rate (LTAR) in 2017 at a low level of 0.2 days lost per 200 000 hours of work, as compared to 0.19 days lost in 2016.




**International  
Council of Chemical  
Association (ICCA)**  
icca-chem.org

## Performance

### INPUT

 **248**  
Investments in property,  
plant and equipment in CHF m


 **2 674**  
Raw material procurement in CHF m


 **125**  
Production facilities

 **3.14**  
Raw materials procured in m t

### OUTPUT

 **6 377**  
Sales in CHF m

 **15.3 %**  
EBITDA margin before  
exceptional items


 **428**  
Operating cash flow in CHF m

 **4.60**  
Production volume in m t

## People

### INPUT

 **7 000**  
Suppliers of raw material

 **65 %**  
Raw material supply base by  
spend covered by sustainability  
evaluations

### OUTPUT

 **0.20**  
Lost time accident rate (LTAR,  
accidents with at least 1 day  
lost/200 000 work hours)

## Planet

### INPUT


 **3 245**  
Energy consumption in m kWh

 **49**  
Water consumption in m m<sup>3</sup>

### OUTPUT

 **13**  
Waste water in m m<sup>3</sup>

 **198**  
Waste in thousand t

 **0.97**  
Greenhouse gas emissions  
(scope 1 & 2) in m t

# Building Connections



**Janice Nazer**  
Inside Sales Specialist  
Business Unit Additives, USA

# 3

**Ganesh Nadimetla** and some of his colleagues stayed for on-the-job trainings for three months in Charlotte, North Carolina.

## **Clariant's new Shared Service Center in Mumbai not only delivers great customer service. It has also spawned global friendships.**

When Ganesh Nadimetla boarded a plane in July 2017, he was nervous. He'd never been to the United States, never that far from his family nor for that long. »I really didn't know what to expect«, he says. »I had joined Clariant only a couple of months earlier and now they were flying me across the globe.« His flight would take him from his home in Mumbai to Clariant's North American Headquarters in Charlotte, North Carolina. He would stay there for almost **three months to train for a job** he'd soon be doing back in Mumbai.

»I was hired to do customer services, specifically order processing«, Ganesh explains. »That means dealing with customers, entering orders, resolving issues that may come up with logistics or supply chain planning.« Ganesh has ten years of experience doing this kind of work. He has worked for several multinationals, most of them chemical companies. »However, I had always worked by proxy, via outsourced service providers, never for the company directly«, he says. With Clariant it is different. Today, Ganesh is part of a Clariant organization called Global Business Services that in 2015 set up a Shared Services Center in Mumbai. It handles what's called Order-to-Cash, the processing of orders for the Business Units Additives and Pigments. The orders in question come from customers in the United States and Canada.

The idea of bundling together services such as finance, customer services, logistics and others for certain Business Units and regions in a central location is part of the evolution of a shared services center concept that Clariant introduced in 2013. It forms the basis of Clariant's Global Business Services unit. Today Clariant operates three shared service centers, or SSCs, located in Lodz, Poland, Mumbai, India, and Dalian, China. They handle services across all regions and several businesses as well as Service Units in an end-to-end approach spanning accounts payable, accounts receivable, procurement, reporting, master data management, logistics, credit risk management and order-related customer service activities. The Lodz center serves customers in more than a dozen languages. Mumbai is focused on English language serviced countries in Asia Pacific and, increasingly, North America. The SSC deals with clearly defined and standardized transaction-based services or »end-to-end processes«, as they are referred to in process-management jargon. That makes it easier to bundle and optimize services across different businesses, which in turn makes them more efficient.

With a growing number of colleagues, the expanded new customer service operation in Mumbai is contributing significantly to the growth of this service delivery model. »Our setup is tailored towards the needs of the North American market«, says Christopher Spahn, who heads the team in Mumbai and previously led global transitions into Clariant's centers in Lodz and Mumbai. He says he is especially impressed with the speed, quality and consistency with which the new customer service team in Mumbai is delivering service. »That's really important to us, because order processing is a service that's very close to our customers. So this isn't about outsourcing services to a country with low labor costs. Ganesh and all the others are a vital part of Clariant and the North American team.«

That distinction became perfectly clear once Ganesh arrived in Charlotte. »We got the full tour of the production site. We actually got to experience how and where the products are made. And who the people behind it all are«, Ganesh remembers. That's when he got to know Janice Nazer. She's an Inside Sales Specialist for Clariant's Additives Business Unit but had also been handling orders for the past two years. Ganesh was to shadow her at work and learn the trade during the so-called knowledge transfer phase on site. »At first, I thought Ganesh would be in my office for maybe a week or two and then we'd find him an office of his own«, she remembers. »But he was so eager to soak up everything there was to know. In the end, we shared my office for the whole length of his stay.« Together they worked through practically anything that can come up. And they became friends.

»Janice took me in like family«, Ganesh says. »We talked a lot about our lives. I got to meet her husband.« Janice could relate somewhat to Ganesh being away from home. She had herself moved to Charlotte from Chicago only two years ago and had come to the U.S. from the Philippines as a teenager. »Ganesh talked a lot about his family and his life in India«, she says. »It was interesting and we just connected. I sometimes miss having him in my little office to chat.«

After long days at the office, the Indian coworkers explored the sights of Charlotte and went out for dinner with their American colleagues. Janice remembers going out to a restaurant only to find out it was »Elvis Night«. »It turns out, Ganesh knew Michael Jackson but had never heard of Elvis.« Needless to say, Janice had a lot of explaining to do. The professional knowledge transfer was more intense and highly structured. »We analyzed our current processes in order management and then mapped out an improved system as well as all the tasks

## 10.5

**Due to time difference** of 10.5 hours between North America and India, the team in the SSC in Mumbai works night shift.

**»Ten years in customer service, but I have never worked directly for a multinational. It's great to be part of a global team.«**

**Ganesh Nadimetla**  
Customer Service Representative  
Shared Service Center, India





**»Order processing is a service very close to the customer and therefore very important for our success.«**

**Christopher Spahn**  
Head of Shared Service Center, India

our team in India would have to perform«, explains Joe Rhinehart. As a Global Process Expert in Order-to-Cash he led the transition from Charlotte and evaluated the progress of each trainee. »We tracked which types of transactions each trainee had already worked on and spoke to them every day about how things were going«, he says. There were tests and a lot to learn. »There's more to it than people think«, says Janice. »It's not just taking orders and entering them into a system. You have to have people skills, obviously, and you have to be creative. Say, if you're re-routing orders in order to meet a certain deadline.«

# »We analyzed our current processes and then mapped out an improved system that is being implemented in India.«

**Joe Rhinehart**  
Global Process Expert  
Order-to-Cash, USA



But it wasn't just the Indian team who had to be brought up to speed. »Janice introduced me via e-mail to her 300 plus customers, telling them about the upcoming changes and how we were training together in order to ensure a smooth transition«, Ganesh remembers. There were concerns that had to be addressed. »Probably everyone in America has at one point dealt with a customer services rep in India«, says Joe. »I know I have, with my credit card company, for example. It's not always great.« More than once he, Janice and others had to explain that they weren't outsourcing customer services. »I just recently told a customer from New York about Ganesh specifically, what he'll be doing for him and how we both worked together«, Janice says. It's not that common for US employees to know their Indian customer service reps by name, let alone, to have celebrated Elvis Night together.

Part of the American team had to be brought onboard as well. Janice was more than happy to teach Ganesh. »I was actually hired to do sales, following up on leads, calling up existing and potential clients. That is also my professional background«, she says. »It was only during the last two years that I took on order processing as well and, to be perfectly honest, it ate up way too much time for me

# 300

**Roughly 300 customers** of Business Unit Additives in North America are served from India.

to still be effective in sales.« So giving up order processing came as a relief and a way to focus on sales again. But not all of her colleagues immediately saw it that way. Some feared they were essentially teaching people to take over their own jobs. »That's an impression we had to deal with«, says Joe. »But we were able to transfer the majority of our people into jobs higher up in the value chain. A few were retiring anyway. In the end, only a single person decided to look for new work outside Clariant.«

In October of 2017 it was time for Ganesh to fly back to Mumbai and start working from there. The service desk was going live. In fact, Ganesh wasn't the only one boarding a flight to India. Joe Rhinehart, Janice Nazer and Joellen Kuebler, the Head of Order Management for the Pigments Business Unit, came to help with the launch. Joe, Janice and Joellen, or the »Flyin' Jays«, as they jokingly referred to themselves, got to work, now shadowing their Indian counterparts instead. At first, the SSC in Mumbai was processing orders for about 60 percent of the customer base. When that worked smoothly they added the remaining 40 percent. This soft launch made for a rather anticlimactic experience: »There really wasn't that Day Zero«, Joe remembers. The team in Mumbai more or less just eased into things. »I wasn't at all surprised«, Janice says. »Ganesh was basically doing my job weeks before he even left for India. His performance had brought around even the most critical of customers. To them, there really was no discernible difference in terms of service quality.«

Obviously there are some differences. Ganesh speaks perfect business English but with a heavy Indian accent. »That's never been a problem«, he says. »Especially since 90 to 95 percent of our communication is via e-mail anyway.« And for those e-mails, the response time has dropped significantly, meaning customers get a reply and their unique job number almost immediately, with timely follow-ups if necessary.

Janice and Ganesh still stay in touch. She's still the liaison for the Additives Business Unit. »We talk on the phone a couple of times a week«, Janice says. Ganesh enjoys hearing her all-American idioms, the occasional »awesome« and »oh, my gosh!« And she has fond memories of her short stay in Mumbai. »The whole team was so open and welcoming to us. They all wanted to introduce us to Indian culture and cuisine.« Ganesh also wanted to introduce her to his wife and two kids. »It was the time of Diwali, the festival of lights, when we were there«, Janice remembers. »The streets were packed even for Mumbai's standards. It was an experience I'll never forget.« But working there was hard at times, too. To synchronize with North American business hours, the team at the SSC works night shifts from 5:30 pm until 2:30 am. »Working nights can be tough on you«, Ganesh says. But there are upsides too. Like when he rides his bike home from work in the early hours of the morning. »There's almost no traffic, which in Mumbai is a heavenly experience. And also, it just feels great to be part of such a truly global team.«



# Value Creation in the Four Business Areas

17

**Clariant** currently has 17 Innovation Black Belts throughout all seven Business Units.

180

**Care Chemicals** offers more than 180 products in RSPO (Roundtable on Sustainable Palm Oil) mass balance quality for Personal and Home Care markets.

5

**Plastics & Coatings** has grown at a rate of 5%.

110

**Catalysis** had 110 active innovation projects in 2017.

10

**The growth potential** of lead-free organic pigments is estimated at approximately 10%.

14

**Business Unit Catalysts** operated 14 production sites globally (excluding 50:50 or minority joint ventures).

35

**Functional Minerals'** production site in Indonesia increased the production capacity for bleaching earths by 35%.

#### 2017 IN NUMBERS

Innovation is key. Finding new solutions and bringing new ideas to market helps drive Clariant's growth. The numbers in this chapter show how its Business Units commit to innovation, how their investment in R&D drives progress and how decisively they focus on the needs of their customers.

# How Care Chemicals Creates Value

**Market insights, cutting-edge technologies, and a forward-looking approach to business comprise the core of Care Chemicals. By following lifestyle-driven megatrends, the Business Area strengthens Clariant's position and image as a supplier of sustainable products.**

## 1. Focus on future technologies and new business

Comprising Industrial & Consumer Specialties and New Business Development, Care Chemicals focuses on highly attractive, high-margin, and low-cyclical markets. → FIGURE 001

The 15 production sites and application and development centers of Industrial & Consumer Specialties around the world focus on products that require similar technologies and common production capacities. Care Chemicals' customers are varied: some receive ingredients for formulating products that are then distributed through retailers to end consumers; others redistribute to professionals, for use in industrial cleaning, aviation, or construction, for example. Customers include not only global brand owners, but also »local heroes« – smaller, private labels that capture market interest through claims-driven positioning.

While New Business Development falls under the umbrella of Care Chemicals, it scouts and develops opportunities with disruptive potential for all Business Areas, helping to address the world's sustainability challenges. By looking beyond current businesses, New Business Development identifies areas with growth potential while also recognizing business risks for current Business Units.

## 2. Demand for sustainable products increases further

While most markets for Care Chemicals show signs of rebound, particularly in North America, Europe, and Asia, the last three years of recession have changed consumer preferences. These markets increasingly favor healthier, longer-lasting, sustainable goods with natural or bio-based ingredients instead of fossil-fuel-based products. In addition, customers are also requesting traceability – such as for palm oil derivatives – and substantiation of the sustainability claims in the marketing storylines.

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### 001 APPLICATIONS

#### Industrial & Consumer Specialties

- |                     |                  |                          |                       |
|---------------------|------------------|--------------------------|-----------------------|
| – Automotive fluids | – Construction   | – Heat transfer fluids   | – Paints and coatings |
| – Aviation          | – Crop solutions | – Industrial & Home Care | – Personal Care       |
|                     | – Gas treatment  | – Industrial lubricants  | – Special solvents    |

#### New Business Development

- |                    |                                                               |                         |                            |
|--------------------|---------------------------------------------------------------|-------------------------|----------------------------|
| – Food ingredients | – Silver based inks for the electronic and graphic industries | – 3D printing materials | – Encapsulated ingredients |
|--------------------|---------------------------------------------------------------|-------------------------|----------------------------|

Clariant meets these demands by increasing innovation campaigns and deepening its understanding of market needs and forward-looking trends. In 2017, Clariant not only continued the BeautyForward trend initiative, but also launched **CleanForward™**, a platform that opens doors for dialogue with formulators and brand owners about global trends in the Home Care market and how Clariant technology can help address them.

In crop solutions, increasing regulatory pressure concerning adjuvants – additives that improve a pesticide's ability to protect agricultural plants – opens up unprecedented opportunities for replacement. In industrial lubricants, with the trend toward faster machining, standard lubricants are no longer able to cope with the higher loads, speeds, and temperatures. Synthetic-based oils and multifunctional additives are becoming indispensable.

### 3. New opportunities beyond current businesses

The global trends of sustainability, digitalization and the growing middle class are the key drivers for New Business Development. The growing middle class with changing food tastes and increased consumption are intensifying global food supply challenges and waste production. Clariant responds to these challenges with solutions for sustainably produced food ingredients and improved recyclability of plastics. Sustainable energy management as well as the continued trend towards miniaturization in handheld devices and adding electrical circuits to all »internet of things« products create new market opportunities for printed electronics. With **PRELECT® silver nano inks**, New Business Development developed a solution used for fine line printing,

such as for printing blue tooth antennae, that also creates less waste water and uses less energy than traditional production technologies.

Emerging markets such as China and India are building their infrastructure with sustainable solutions from the start. To participate in this growth, by the end of 2017 more than half of the New Business Development group had been relocated from Europe to China and Taiwan, as well as Latin America.



### 3.1. Three focus themes and new business fields

In 2017, the innovation efforts of Industrial & Consumer Specialties focused on three main themes:

1. Providing »smart solutions« that allow customers to differentiate with highly efficient and cost competitive formulations. This needs in-depth understanding of structure-effect relationships, supported by collaboration with partners such as the Leibniz Institute of Polymer Research Dresden (IPF).
2. Continuously shifting toward a more sustainable product portfolio by focussing on an improved **renewable carbon index (RCI)**, which measures how much a product is based on renewable rather than fossil-fuel sources – an index of interest to key global accounts – and on the responsible and sustainable sourcing and use of renewable raw materials. As an example, Clariant has certified all its relevant production sites and is able to offer its customers sustainable palm oil derivatives certified according to the criteria of RSPO (Roundtable on Sustainable Palm Oil).

## 4

**The CleanForward™** platform gives a face to the four global megatrends of convenience, sustainability, well-being and demographic change, providing unique insight into what moves people around the world concerning home care.



### PRELECT® silver nano inks

[clariant.com/en/innovation/innovation-spotlight-videos/nano-silver-inks](http://clariant.com/en/innovation/innovation-spotlight-videos/nano-silver-inks)

# >50

**Clariant** achieved an RCI above 50 % for rheology modifiers that change flow behavior of paints and cleaning products that were previously fully petrochemical-based.

3. Anticipating regulatory changes and proactively developing compliant alternatives. For example, regulation on preservatives is increasing and Clariant focused innovation on boosters that allow customers to lower preservative concentrations and new products that support »preservative-free« claims.

Key developments in 2017 were the inauguration of the new crop greenhouse → **PAGE 46**, which received very positive early feedback including joint development proposals from customers, and the launch of the new Active Ingredients Unit → **PAGE 78** to develop new powerful solutions enhancing performance and user experience in skin, hair and body care. Clariant also continued to setup R&D facilities into global trend-setting

markets such as Asia Pacific for skin care or Latin America for hair care where Clariant operates its Hair Care Competence Center in Brazil, the most diversified and fastest growing region for hair care in the world.

New Business Development strives to convert promising innovation ideas which are beyond the scope of the Business Units into profitable business. In order to make sure that new businesses can be successfully integrated into established processes, businesses are developed until they are in the market and have a proven value proposition, market channels and marketing approach. Current activities include food ingredients solutions with a special focus on helping food companies increase the health of their products with sustainable

## »Our new Active Ingredients Unit is a flexible start-up to rapidly launch active ingredient innovations that meet the highly specialized product development needs of our customers and end consumers.«

**Christian Vang**

Head of Business Unit Industrial & Consumer Specialties

ingredients, tailored materials for 3D printing leveraging Clariant's broad portfolio of pigments and additives, silver nanoparticle containing inks for the electronic industry and encapsulated active ingredients for the Personal Care industry, such as Vitispheres®.



MARKET TO CUSTOMER

### 3.2. Clear claims and sharper focus to support value capture

In 2017, Industrial & Consumer Specialties simplified the portfolio by 20 % through pruning old technology to bring more clarity to the product offerings and reduce complexity cost. In addition, the product launch process was revisited to emphasize value propositions. For example, in personal care the effect of products from an end-user standpoint were documented and in home care the mode of action of product molecules was substantiated using Electron Magnetic Resonance (EMR) facilities. Key accounts recognize Industrial & Consumer Specialties as a strategic, innovative supplier and customer satisfaction and retention further increased in 2017.

Care Chemicals further developed its comprehensive value-based pricing strategy, which focuses on end-user benefits rather than cost. For example, Genamin® Gluco 50 is currently the only label-free, renewable-based amine for paint neutralization on the market that is free of volatile/semi-volatile compounds (VOC/SVOC). It is an ideal ingredient for paints that are certified with an ecolabel, such as the German Blue Angel, the

U.S. GreenSeal, or the Chinese TenRing. Its outstanding sustainability profile was recognized in 2017 with the prestigious »Ringier Technology Award« in China for the category Coatings Additives. Price strategy for Genamin® Gluco 50 is not based on simply being a substitute for a typical additive, but on the value of its stabilization properties and the new VOC-free claim.

In addition, Care Chemicals explores innovative go-to-market routes with digital applications that help customers qualify their needs, navigate the offerings, and select the right product. Examples include the paints and coatings and crops segments, where formulation complexity and regulatory requirements are increasing, and personal care where the »Clarify« mild surfactants product navigator will be launched. In addition, to simplify order placements for routine products, Care Chemicals will open an online customer center starting with industrial applications.



CUSTOMER TO CASH

### 3.3. Increasing capacity and ensuring process safety and systems integration

In 2017, a key focus in production was broadening the technology portfolio, increasing capacity, and improving competitiveness. In Tarragona, Spain, Industrial & Consumer Specialties is building an integrated production plant for the Squalene/Squalane product portfolio. Squalane and Squalene are used in a variety of cosmetics as a natural moisturizer and are mainly produced from shark livers or olive oil distillates. The now fully inte-

# 20

**Safety counts:** 20 tailor-made awareness and leadership workshops were carried out in Industrial & Consumer Specialties.

grated process in Tarragona will be based exclusively on non-edible olive oil distillates as a true renewable resource. An additional step forward is the full integration of all production steps at a single location, which will reduce the transportation distances along the value chain by a factor of 10, while improving quality and safety. In the major growth regions Asia and North America, the focus was to ensure benefits from strategic investments. For example, the cGMP pharmaceutical quality qualification is in full swing for pharma polyethylene glycol products at Huizhou, China, and the two new production lines for Ethoxylates at Clear Lake, Texas, that almost double capacity in the United States are already close to full utilization.

To maintain and even further improve high safety standards, **20 tailor-made safety awareness and leadership workshops** have been conducted at the sites in Germany, Brazil, China, Japan, and India. Also, a dedicated logistics cost optimization project was set up in

collaboration with the Clariant Supply Chain System (CSS) to identify cost saving potential. The pilot in the Europe, Middle East and Africa region already revealed significant cost saving potential of CHF 4.7 million per year, and global roll-out, including deep-dive analyses on outbound freight and supply chain costs, is planned.

In 2017, New Business Development focused on how to effectively and efficiently set up new businesses while ensuring optimal integration with existing systems. Since agility is key for taking advantage of emerging opportunities, standardization and flexibility need to be well balanced. Making optimal use of Clariant Excellence tools and leveraging the Clariant sales organization for new business offerings beyond established channels, such as leveraging digital marketing for a more effective and targeted customer acquisition as well as establishing an e-commerce site to support the sales of 3D printing materials.

## Targets

**4-5%**

Growth potential per year

**18-19%**

EBITDA target margin

## Performance

### INPUT

**> 2.5%**

R&D spend of sales

**877**

Raw material procured in CHF m

**> 70**

Active innovation projects

**15**

Production sites

**2697**

Number of raw materials procured

### OUTPUT

**1575**

Sales in CHF m

**8%**

Growth in local currencies

**18.4%**

EBITDA margin before exceptional items

**0.96**

Production volume in m t

## People

### INPUT

**27 479**

Training hours

**1709**

Raw material suppliers

### OUTPUT

**2582**

Staff in FTE at year end (2016: 2574)

## Planet

### INPUT

**727**

Energy consumption in m kWh

### OUTPUT

**30.6**

Waste in thousand t

**210**

Greenhouse gas emissions in kg/t production



# > 300

**Active Ingredients lab** screened more than 300 genes which are known to be involved in physiological processes of the skin.



**Ernesto Horikoshi**  
Head of the Active Ingredients Unit

# Promising Results

## **Clariant's new venture in active ingredients for personal care has already made a splash. And the people behind it are only getting started.**

Starting something new isn't always easy, but it can be rewarding. That's one of the reasons why start-ups are valued the way they are these days – by investors as well as by talented graduates entering the job market. They're nimble, they tap into social and technological trends, create new markets and shake up old ones. When Ernesto Horikoshi calls his business a start-up, he's banking on these notions even though his business card reads Clariant. »We function as a company within the company«, he says. »We're a very small team, but that makes us agile. In an industry as fast-moving as ours, that is a significant advantage.« The industry in question is cosmetics, more precisely active ingredients for skin and hair care. Whenever a lotion, cream or conditioner claims to have a beneficial effect, it's usually these active ingredients that do the heavy lifting. Until 2016, Clariant's production for the cosmetics industry focused on functional ingredients such as emulsifiers, surfactants or preservatives. It wasn't until January 2017 that the company launched its own Active Ingredients Unit, putting Horikoshi in charge.

Horikoshi perfectly fits the start-up stereotype. As do his surroundings. The suave 36-year-old Brazilian meets us in a mostly vacant office building on the outskirts of Toulouse. It's part of the Sanofi Biopark. The French multinational pharmaceutical company Sanofi moved



## ACTIVE INGREDIENTS FROM NATURE



### Eosidin™ from green Citrus unshiu

Indoor pollution is a key factor in long term skin problems. Studies show that all over the world levels of indoor pollution exceed the average allowed by the World Health Organization. Eosidin™ is the first product targeting indoor pollution to avoid atopic-prone skin and hypersensitivity. Eosidin™ is a well characterized extract of green citrus unshiu, coming from the protected Jeju Island in Korea.

**Find out more at:** [www.clariant.com/eosidin](http://www.clariant.com/eosidin)



### Bluemidin™ from Lespedeza capitata

Scientists say that blue light or High Energy Visible (HEV) light with wavelengths between 400 and 500 nm can penetrate and harm the skin even more deeply than UV light. Bluemidin™ targets effects of so-called screen pollution from computers, smartphones and tablets. Bluemidin™ is extracted from Lespedeza capitata, a plant grown in South Korea and long valued for its medicinal properties.

**Find out more at:** [www.clariant.com/bluemidin](http://www.clariant.com/bluemidin)

out of this vast research campus a few years ago and is now renting out the abundant offices and lab spaces. Horikoshi and his team have installed their headquarters in a handful of offices lining half of a corridor in the main building. What could one day become a big silicon valley-like campus for biotech firms today seems somewhat deserted. The people that are here, however, are here to make a splash. »There are about 15 biotech start-ups here right now«, says Horikoshi as we pass half a dozen young men and women having lunch in the foyer. He wishes them »bon appétit« before turning and whispering »One of our competitors. They are located in the same building.«

## 1.2

**The size** of the global active ingredients market is USD 1.2 billion. It's projected to grow at an average annual rate of 5.2% for the next five years.

Why Toulouse? »France has been a global powerhouse in cosmetics for decades. So setting up shop here made perfect sense to us«, says Horikoshi. »Our big global customers are all close by, which helps when it comes to both monitoring trends and working together on R&D. Also, Toulouse has some great universities producing a steady stream of young specialists in biotech.« Although, listening to Horikoshi and his right-hand man Alexandre Lapeyre you might get the sense that they could do without offices altogether. They spend about half their time flying around the globe, talking to customers, visiting industry trade shows and building their network. »In this business, people and knowledge mat-

ter. Assets don't«, Lapeyre says. »There are few barriers to entering the market. You don't need huge production capacities. The biochemistry to make these products is fairly simple.« Horikoshi adds: »What you need are the right people. Bright minds that can turn scientific data into substantiated – and therefore marketable – claims.«

Hanane Chajra has such a bright mind as well as a Ph.D. in biotechnology. Most of her post-doc work dealt with skin substitution. She joined Clariant in early 2017, poached from a competitor – as was most of Horikoshi's team. »My job was basically to build our scientific capabilities from the ground up«, she says. She filled four labs with equipment to study skin samples – anything from microscopes to state-of-the-art gene sequencing equipment. »Right below us, on the ground floor, you'll see people working with basically the same equipment. Only they're doing cancer research«, she says. As she speaks, her colleague Christophe Gonindard is preparing skin samples in order to treat them with a prospective active ingredient. Some will later be exposed to harmful UV light or pollutants in order to test protective agents. Some will be used to construct 3D models that mimic the different layers of human skin. Gonindard and Chajra are wearing the white paper suits, rubber gloves, shoe covers and hairnets ubiquitous in this line of work. »It's crucial that we not contaminate the skin cells and explants«, says Chajra. A steady stream of these samples arrives at the lab via express courier. »They're gathered during plastic surgeries. Anonymously of course! All we know is the part of the body it came from, the age and sex of the patient, and whether they were a smoker«, Chajra explains. »For us, the older and more stressed the skin is the better because we usually try to prove restoring effects.« All these effects have to be rigorously documented but also presented in a way that's easily digestible as part of a sales presentation. »We can show how healthy cells are, how they're producing collagens and which type, which genetic markers we were able to activate specifically and how all this improved the overall properties of the skin«, Chajra explains. »That's how we translate data into claims.«

»Claims are what sells«, says Alexandre Lapeyre. He should know. The 29-year-old process engineer with a degree in international marketing was hired in 2016 as

a Global Technical Marketing Manager, a few months before the launch of the Business Line. He has spent all of his professional career in what he calls »scientific marketing«, referring to both marketing scientific results and using scientific methods in marketing new products. »While you could probably sell a product with an unsubstantiated claim to a consumer, you can't sell an active ingredient without a substantiated claim«, Lapeyre explains. »Without the effect, there is no active ingredient. There is no product.« Finding out which effects consumers seek or might seek in the future is another science in itself. »We monitor trends not only

within the cosmetics market.« One example he gives involves Dyson, a British company known for its vacuum cleaners. »We noticed that they were very successful with a new line of air purifiers that deal with indoor pollution«, says Lapeyre. »So apparently consumers are aware of this problem. And we know the detrimental effects that airborne pollutants like dust or chemical emissions from kitchens, carpets and new furniture can have. But so far, no one in cosmetics was offering a solution.« Within four months the team had a brand new product on the market. Another four months later they received the Innovation Award of the Institute of Tech-



»Everybody here chose to build something new and to challenge themselves.«

**Mathilde Frechet**  
Scientific Director

#### **Skin deep**

New active ingredients are extensively tested on living skin cells. Effects are analyzed both visually and via genetic markers.



# >1800

**The volcanic island** of Jeju is home to more than 1800 different plant species. Many of them are found only there. In 2016 Clariant formed a partnership with BioSpectrum, a South Korean company renowned for its active ingredients derived from Jeju's unique flora.

**Alexandre Lapeyre**  
Global Technical  
Marketing Manager



nology and Studies for Cosmetics, Toiletries and Fragrances (ITEHPEC). »This type of industry recognition is, of course, huge for us«, says Horikoshi. »We've clearly demonstrated how fast we can identify a trend, develop a new product and bring it to a global audience.«

The global cosmetics market moves fast. Tens of thousands of new products are launched every year. Consumers are always looking for innovation, new and improved products – bolder claims, bigger promises. Global giants in beauty products cater to these desires and drive trends worldwide. But there are also strong regional players well attuned to local tastes and sensitivities. »Regional markets differ widely«, says Lapeyre. »Latin America, for example, has a diverse mix of people and skin types. Brazilian consumers are concerned with tanning and moisturizing, while consumers in Japan, South Korea and China look for lighter skin, UV-protection and protection against pollution. Customers in the U.S. and Europe are very conscious about natural and sustainable ingredients.« Another level of complexity

comes with different regulations, both of the ingredients and the claims that companies may use. »This is one area where we benefit from Clariant's years of experience in many global markets«, says Horikoshi. There are other benefits of having a company as large as Clariant behind you. »The brand and its portfolio of formulation ingredients are recognized and highly respected in the industry«, says Horikoshi. »That opens many doors for us with potential customers, and we can also rely on the input of a global sales and marketing team. They're additional eyes and ears in this market for us.«

In marketing, stories matter. Especially when it comes to products that touch so profoundly on personal and cultural issues as health and beauty. Clariant's Active Ingredients Unit may be new to the market, but it sits on a wealth of natural ingredients that not only show beneficial effects but are also imbued with stories. Back in 2015 Clariant established a strategic alliance with Beraca, a Brazilian provider of natural and organic ingredients drawn from deep inside the Amazonian rainforest.



## TWO STRONG PARTNERSHIPS



### Beraca and the Amazonian rainforest

In 2015 Clariant formed a partnership with Beraca, which sources its active ingredients from deep within the world's largest and most diverse rainforest. The Brazilian company is valued by customers worldwide as a reference for sustainable development. It offers full traceability of all its raw materials and works closely with local communities to foster growth and real opportunities.



### BioSpectrum and Jeju island

In 2016 Clariant formed a second partnership with BioSpectrum, a Korean manufacturer of active ingredients. BioSpectrum is renowned for its active ingredients made from extracts from exotic Asian plants found on Jeju island. The volcanic island is home to more than 1800 different plant species – many of them only found there. Some of these substances are also used in traditional Chinese medicine.

A year later Clariant joined forces with BioSpectrum, whose forte are natural extracts from plants found on Jeju, a volcanic island off the coast of South Korea. In fact, Eosidin™, the award-winning new product tackling indoor pollution, has its origin on Jeju. It targets skin immuno-modulation to improve skin that is prone to atopic conditions and hypersensitivity. Which is industry lingo for something that keeps your skin healthy and beautiful even if your workplace or home have harmful stuff in the air. The basis for Eosidin™ is found in the peel of the green Citrus unshiu, a type of citrus cultivated on Jeju and known for its bright orange flesh and green skin. »The fruits we use are actually a waste product from pruning the trees long before the actual harvest«, Horikoshi explains. Finding an effective ingredient, being the first to substantiate a brand new claim and then using such an especially sustainable resource – Horikoshi sees that as the perfect example why Clariant aims to be a global player in this business. »There are no higher growth rates in cosmetics than in active ingredients right now. No area is more exciting.«

A certain excitement was also what drew Mathilde Frechet to Toulouse. She joined Horikoshi's team in May of 2017 as Scientific Director. Her background is in cellular and molecular pharmacology. Before working in cosmetics for companies in France, she got her Ph.D. and post doctoral experience in Italy and the UK researching genetic instability and prostate cancer. She was just putting down roots in Monaco when she heard of Clariant's new venture. »I was maybe getting a bit too comfortable in my old job, so I decided to challenge myself«, she says.

As Scientific Director, she is tasked with setting guidelines for Clariant's R&D in active ingredients. Expectations are high. Eosidin™ has set the bar. »It's our job to create value for customers«, Frechet says. Does that leave room for scientific curiosity? »Of course, we're always trying to push our field of research. It's important to any scientist to publish and present her work.« Frechet was just in Berlin for a conference on skin biology. Chajra came back from Seoul last week, where she presented the biological mechanisms behind Eosidin™. »That's what's so great about working here«, says Frechet. »Everybody has chosen to come here, to build something new, to challenge themselves. We all share this adventure.«

**»We can show exactly how we improved the overall properties of the skin.«**

**Hanane Chajra**  
Head of Skin Biology



# How Catalysis Creates Value

**The Business Area Catalysis offers a wide range of value-adding catalysts for customers in the petrochemical, chemicals, plastics, and refining industries. Catalysis also addresses global challenges of raw material scarcity, energy efficiency, and environmental degradation by improving chemical process efficiency, enabling the use of alternative feedstocks, and developing environmentally compatible catalytic solutions.**

## 1. Addressing local needs with innovative products

The Business Area Catalysis, consisting of the Business Unit Catalysts, is a global catalyst supplier with a long history of innovation and expertise. Creating high-performance catalysts is at the heart of the Business Area's mission, along with Clariant's values of Performance, People, and Planet. Catalysis' innovative products deliver significant value to customers by enabling higher production throughput while lowering energy consumption and reducing hazardous emissions. Clariant's catalysts and technologies also enable the use of alternative feedstock, such as natural gas, coal, and biomass, for chemical and fuel production.

Catalysis runs a **global network of 14 production sites**, with 1970 employees. The Business Area serves customers across all regions and focuses on providing regionally adapted solutions. In China for example,

Catalysis is at the forefront in supporting industrial producers with advanced catalyst innovations and expertise. Chinese customers benefit from Clariant's broad portfolio of catalysts and adsorbents for all major application fields. By combining global and local resources, the Business Area cooperates closely with Chinese customers to solve key challenges regarding productivity, feedstock, energy efficiency, and environmental protection.

For example, with its longstanding experience in methanol production, Catalysis can offer a broad range of catalysts that work for different sizes and operating conditions of production plants. The latest catalyst generation, MegaMax® 800, was developed in close collaboration with one of Clariant's global Licensing Partners to meet the increasing demands of the highly integrated large-scale methanol plants in China. In addition, to support the current construction of many existing medium-scale methanol plants, Catalysis launched MegaMax® 700C, a methanol synthesis catalyst that yields higher activity and less byproducts compared to products from Chinese competitors. The catalyst is produced locally, in Clariant's Panjin plant, and offers all the benefits of the MegaMax® series: high activity and physical strength, high selectivity, and significant savings in feedstock and energy consumption.

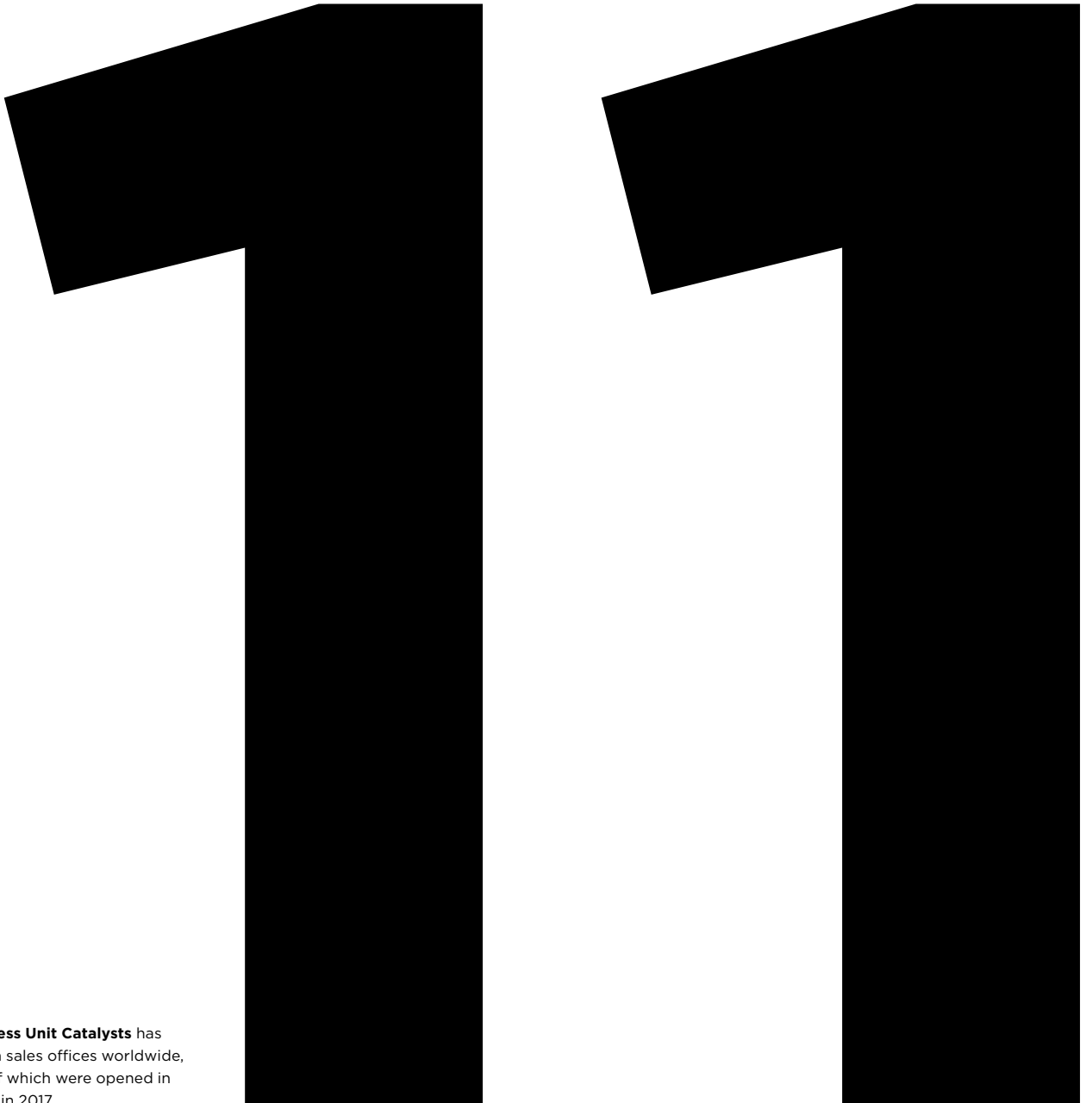
## 14

### The Business Unit

Catalysis runs a global network of 14 production sites (excluding 50:50 or minority joint ventures).

### 001 APPLICATIONS

- Ammonia
- Custom Catalysts
- Ethylene and derivatives
- Fischer-Tropsch
- Fuel cell
- Fuel upgrading
- Gasoline desulfurization
- Gas processing
- Hydrogenation
- Methanol
- Off-gas treatment for chemical plants and stationary engines
- Oxidation
- Polypropylene and on-purpose propylene
- Refinery hydrogen
- Refinery stream purification
- Sour gas shift
- Steam cracker/Olefin purification
- Styrene and BTX, MTP
- Synthetic natural gas
- Zeolite powders



**Business Unit Catalysts** has eleven sales offices worldwide, two of which were opened in China in 2017.



## 2. Market recovery and continued demand for sustainable solutions

In 2017, the global business environment improved slightly, mainly due to higher chemicals prices and stable feedstock cost. The higher demand for polypropylene and propylene derivatives, particularly in China, spurred a strong increase in on-purpose propylene production projects. Other beneficial factors were reduced overcapacity in the ammonia market, low energy costs and overall strong downstream demand.

To reach above-industry growth targets, Catalysis follows the latest market and technology trends closely, as well as new environmental regulations, which often present new business opportunities. For example, regulations regarding the emission of harmful volatile organic compounds (VOC) – which arise during many industrial processes in the chemicals, food, printing, and energy production sectors – are becoming increasingly stringent. In large, high-growth economies in particular, the conventional off-gas purification methods are not suitable for meeting future regulations. Clariant's EnviCat® VOC catalyst effectively removes volatile organic compounds and carbon monoxide from off-gas at a temperature that is **up to 400°C lower** compared to what is required for the conventional thermal oxidation method. The catalyst thus reduces fuel consumption and stress on equipment, resulting in significant economic, operational, and safety advantages. As EnviCat® VOC can be flexibly adapted to the customers' requirements, meeting more stringent emission standards has now become easier than ever.

As population growth, purchasing power, and wealth continue to increase in emerging countries, the demand for resources such as energy, food, and land is also rising. This pressure on global resources makes environmental issues such as climate change, loss of biodiversity, water supply challenges, and waste production even more pressing. Solving those global challenges requires the involvement and support of the chemical industry, particularly catalyst producers. By improving efficiency in chemical processes, increasing the use of alternative feedstocks, and developing environmentally compatible catalytic solutions, the Business Area Catalysis directly addresses the global challenges of increasing energy use, raw material scarcity, and environmental degradation.



### 2.1. Speeding up the innovation process

For Catalysis to maintain its market position as a leading developer and producer of catalysts and adsorbents for industrial processes, innovation is essential. The Business Area thus invests significantly in R&D, operating 11 R&D and technical centers globally, and employing **over 300 R&D experts** (including joint ventures) to develop customized solutions that maximize customer value creation. Catalysis is one of the four Technology Platforms of Clariant, which has built up expertise over decades and participates in many scientific collaborations. A successful example is MuniCat, a long-term alliance between the Technical University of Munich and Clariant in the field of investigation and application of vanguard catalyst systems. For more information on MuniCat, see → [PAGE 90](#).

# 300

More than 300 R&D experts work for the Catalysts Business Unit.

# 400

EnviCat® VOC operates at a temperature up to 400°C lower compared to conventional methods.

»To create value for Chinese customers, we are becoming a ›China Insider‹ while leveraging our access to global knowledge and resources.«

Thomas Wenger

Head of Business Unit Catalysts China

20

**Thanks to** the new ReforMax® LDP catalysts 20% lower pressure drop in the reactor was realized.

By systematically observing, evaluating, and implementing technological innovations, Catalysis not only consistently improves the performance of existing products and processes, but also creates new applications for new markets. Being at the forefront requires prioritizing the most promising applications and accelerating the time-to-market, based on a profound expertise in catalyst formulation and process technologies. In 2017, the innovation management was particularly focused on accelerating the time-to-market. Catalysis started tracking all innovation projects on the time it took to move from scouting to scoping to the commercialization phase. This speed monitoring supports a strong, dynamic project pipeline and stops projects early that are not developing as expected. At the end of 2017, the Business Unit Catalysts boasted a pipeline of more than 110 innovation projects. During regular project portfolio reviews the resource allocation is challenged and, where necessary, adjusted to the current market and technology environment. The increased focus on speed has materialized already: Compared to 2016, when 40 projects passed the gate to the next stage, **74 projects advanced** in 2017. Overall, a total of 53 innovation projects were started.

For example, in 2017 Catalysis launched ReforMax® 330 LDP Plus and ReforMax® 210 LDP Plus, two new generation steam-reforming catalysts for manufacturing synthesis gas that is used to produce hydrogen, ammonia, and methanol. Their unique and innovative configuration ensures that the pressure drop in the reactor can be **decreased by up to 20%**, which allows for significant energy cost savings while increasing the reformer gas throughput.



MARKET TO CUSTOMER

## 2.2. Customer orientation as a guiding principle

Understanding that customer orientation is essential for business success, Catalysis conducts workshops regularly with customers to understand their needs, target innovation activities, develop solutions that add value, and create convincing value propositions. In 2017, Catalysis held numerous customer conferences and trainings all over the world. These included client seminars and workshops in China, South Korea, Bahrain, Egypt, Germany, the UK, Canada, and the U.S. The strong regional presence allows Catalysis to cater to customer needs, as these needs often differ from country to country. In 2017, Catalysis opened two new offices in Qingdao, Shandong province and Yinchuan, Ningxia province to strengthen its presence in China. The Shandong region in the north is a key location for refining, petrochemical and chemical companies, the Ningxia region in the northwest of the country is home to many coal-to-chemicals producers as well as numerous syngas and polyolefin companies. The new offices allow Clariant to cooperate more closely with local customers and enable faster, tailor-made engineering services and sales assistance.

Collaborations with strong process technology licensors help Catalysis lead innovation and continuously improve efficiency. Such partnerships open doors to large growth projects and significantly contribute to the development of tailor-made products and solutions. In 2017, Clariant signed a global licensing agreement with RTI International, granting the exclusive right to supply a solid fluidizable sorbent material used for RTI's warm gas desulfurization process technology. The quick-reacting sorbent has a high capacity for adsorbing sulfur, thus enabling sulfur-containing gas streams to be

74

**74 innovation projects** passed to the next stage in 2017.

# »Our service quality proves to be of great added value for our customers.«

**Stephan Werner**

Sales Account Manager, Business Unit Catalysts

cleaned at elevated temperatures, which reduces the need for substantial gas cooling and expensive heat recovery. Thanks to the more efficient process, **capital and operating costs for the customers are reduced by up to 50%**, and greenhouse gas emissions are minimized.

Catalysis has long-standing experience in the development and production of Custom Catalysts for petrochemical and refining, emission control, syngas, chemical, and other applications. State-of-the-art production facilities around the world and outstanding technical expertise enable Clariant to scale up and commercialize new custom-made catalysts, while guaranteeing confidentiality at all stages to protect the customers' intellectual property. In 2017, Custom Catalysts ran more than 50 projects that have been commercially implemented.

To ensure the safety, reliability, and cost-effectiveness of the customers' plant operations, Clariant's highly experienced technical service engineers provide a range of performance evaluation and monitoring services, along with on-site service, software provisioning, and trainings. The high service quality is key for customer retention, as the example of a Spanish petrochemical company illustrates. After being a customer for many years, the company switched to another supplier due to a significantly lower price offer. However, product quality proved inferior and the lacking technical service decreased process efficiency. After Clariant's engineers provided first-class, comprehensive service and intensive technical advice, the customer decided to source their catalysts from Clariant again and renewed the successful cooperation.



CUSTOMER TO CASH

## 2.3. Accelerating change in procurement

Efficient procurement activities are a prerequisite for leveraging economies of scale and minimizing expenditure on ordering and delivery tracking processes. To increase efficiency and streamline raw material procurement, Catalysis partnered with Global Business Services and Group Procurement Services in 2017. Accordingly, previously decentralized operational procurement departments in Germany, Italy, Qatar, and South Africa were consolidated in Clariant's Shared Service Center in Lodz, Poland, and activities in the United States were transitioned to the Shared Service Center in Mumbai, India. A clear delineation of responsibilities between Catalysis, Global Business Services, and Group Procurement, in combination with defined processes, further increased the effectiveness and efficiency of Catalysis' supply chain organization. The newly established performance measurement, which incorporates service-level agreements, also permits greater flexibility in customer order fulfillment. In addition, globally standardized processes help better identify and eliminate cost-intensive airfreight for raw materials. Overall, the reorganization of procurement practices resulted in an increase of efficiency with a positive effect on the Business Area's performance.

## 50

**A quick-reacting sorbent** reduces the costs of the warm gas desulfurization process by up to 50% percent.

## Targets

**6-7%**

Growth potential per year

**24-26%**

EBITDA target margin

## Performance

### INPUT

 **6.4%**

R&D spend of sales

 **214**

Raw material procured in CHF m

 **110**

Active innovation projects

 **14**

Production sites (50:50 or minority joint ventures not included)

 **1296**

Number of raw materials procured

### OUTPUT

 **767**

Sales in CHF m

 **13%**

Growth in local currencies

 **25.8%**

EBITDA margin before exceptional items

 **0.06**

Production volume in m t

## People

### INPUT

 **19101**

Training hours

 **567**

Raw material suppliers

### OUTPUT

 **1970**

Staff in FTE at year end (2016: 1548)

## Planet

### INPUT

 **557**

Energy consumption in m kWh

### OUTPUT

 **12.4**

Waste in thousand t

 **2758**

Greenhouse gas emissions in kg/t production

# Boosting Innovations

**Maricruz Sanchez-Sanchez and Gerhard Mestl talk about their joint research into catalytic processes at MuniCat and how it might change both an industry and the world.**



**Maricruz Sanchez-Sanchez**  
Scientist at the Catalysis Research  
Center at the Technical University of  
Munich (TUM)

**Gerhard Mestl**  
Head of Oxidation Catalysts



# 125

**Clariant** is part of more than 125 scientific and research partnerships all over the world.



**First of all, congratulations to you both! In 2017 you received prestigious awards for advancing the field of catalysis. Ms. Sanchez-Sanchez, you won the German Catalysis Society's Jochen Block Award honoring outstanding young scientists.**

**MARICRUZ SANCHEZ-SANCHEZ** Yes, thank you. It's an honor of course. Especially since it is the scientific community that nominates the candidates for the award.

**And Mr. Mestl, you were awarded the EFCATS Applied Catalysis Award by the European Federation of Catalysis Societies for »individuals displaying excellence in scientific novelty, technical achievements in development and scale-up«.**

**GERHARD MESTL** Thank you, although I'm really not too comfortable with the »individual contributions« part. We're talking about all the work that has been

#### **A different scale**

Catalytic processes rely on many different variables. Working in tiny batches allows researchers to experiment more freely.

done in the Department of Selective Oxidation catalysis at Clariant during the past twelve or thirteen years. If anything, my work has been very much a team effort.

#### **Which very neatly brings us to your joint research here at MuniCat. What is it you do together?**

**GERHARD MESTL** MuniCat studies and develops new or improved catalysts. We both work on selective oxidation.

#### **Your field of research is selective oxidation. Where would I find products that were made using these kinds of reactions?**

**GERHARD MESTL** We're talking about intermediates, most of which go into polymer production, for example nylon.

#### **What makes selective oxidation such a useful tool?**

**GERHARD MESTL** Basically, the thermodynamic end result in any oxidation would be CO<sub>2</sub>. So whenever you can't fully control the outcome of your oxidation, you end up with CO<sub>2</sub> as a waste product. Selective catalysis at its best allows you to avoid that and yield more of your desired product.

#### **What are you currently working on?**

**GERHARD MESTL** One of the processes we're developing could eventually be used to convert ethane into ethylene.

#### **Why is that useful?**

**GERHARD MESTL** Ethane is the second most abundant hydrocarbon in shale gas after methane. And ethylene is used in a wide variety of industrial products – most notably polyethylene, the world's most common plastic.

#### **What's the advantage of using catalysis?**

**GERHARD MESTL** Today ethylene is produced in crackers using petroleum or its byproducts and vast amounts of energy.

**MARICRUZ SANCHEZ-SANCHEZ** Our alternative process would use only a fraction of the energy. More importantly, almost all the carbon in the ethane goes into the ethylene, leaving little if nothing to be converted into CO<sub>2</sub>.

**Cracking is a huge, well-established industry. How high are the technological hurdles for your process?**

**MARICRUZ SANCHEZ-SANCHEZ** Crackers need to be huge if they are to operate economically. That's why they're usually situated close to global petrochemical hubs. Ethane is mostly found in remote places. It's therefore seldom used as a chemical resource and often burned off onsite. Our process would work well on a much smaller scale and could be employed wherever shale gas is found.

**That all sounds promising. Are you also breaking new ground chemically?**

**MARICRUZ SANCHEZ-SANCHEZ** The catalyst material isn't new in terms of its composition. But it's heavily optimized.

**GERHARD MESTL** There are metal oxides involved, the main components being molybdenum, vanadium niobium, tellurium.

**Those sound exotic and expensive ...**

**GERHARD MESTL** They are. That's why we developed a method of synthesis that makes very efficient use of those materials. When we've crystalized our materials in the lab, the remaining water doesn't contain any left-over metals. That's extremely important when you plan on eventually producing tons or even thousands of tons.

**Speaking of scaling up, how hard is it to turn lab results into an industrial process?**

**GERHARD MESTL** It's practically our main challenge. Not everything that we can make work in a lab will be feasible on an industrial scale. For example one of our most significant achievements at Clariant is using a coating technology to cover a ceramic support material with a precisely structured catalytic surface. That's all well and good. But both the ceramic structure and the catalytic surface have to then withstand a fall of about six meters into the reaction tube before they can even get to work.

**MARICRUZ SANCHEZ-SANCHEZ** That's a good example of something that a lab researcher would never think about if it weren't for the close collaboration with an industry partner.

**How often do you both actually get together?**

**GERHARD MESTL** At least once a month. We share our latest results and give each other updates on our work.

**Who is involved on either side?**

**MARICRUZ SANCHEZ-SANCHEZ** From our side at the TUM, there's me, the chairs of both departments involved and our Ph.D. students working on the projects. While one department deals with the experimental work, the catalytic tests and the characterization of samples, the other department works on simulations and kinetic models using our data.

**GERHARD MESTL** Clariant sends about the same number of people, which include our researchers and developers as well as people from other departments such as sales and marketing whenever a project is at a stage where we would get potential customers involved – which for some is already the case.



**ABOUT MUNICAT**

MuniCat, the Munich Catalysis Alliance between Clariant and the Technical University of Munich (TUM), is a strategic partnership between one of Europe's leading universities and Clariant, a global industry leader both in specialty chemicals and catalysts.

The partnership is rooted in a long tradition of joint research projects between TUM and the company. Since its founding in November 2010, MuniCat has brought together experts from both sides for research and development projects on industrial catalysis. It has so far produced more than 100 scientific papers and a dozen patents. **»We've succeeded in forming a highly productive cluster in this field«**, says Prof. Dr. Richard Fischer, the coordinator for MuniCat at Clariant and a professor for industrial catalysis at the Technical University of Munich. The joint research of the roughly 100 people

involved focuses on understanding and developing new catalysts. **»Our work in MuniCat has yielded several improvements in established processes as well as groundbreaking research into completely new catalytic solutions«**, says Fischer. **»Several of the innovations focus on the recovery and use of CO<sub>2</sub> from industrial emissions. For example, we've developed a sustainable process for turning CO<sub>2</sub> into methane, ready to use in the natural gas grid.«**

The scientific research is concentrated at the TUM Catalysis Research Center or CRC in Garching, just north of Munich. MuniCat has close ties to two of Clariant's catalyst research sites, one in Heufeld, about an hour south of the CRC, and one in Louisville, Kentucky. Clariant contributes up to two million euros annually to the funding of MuniCat and is expected to extend the cooperation beyond its expiration date in 2022.



**Richard Fischer**  
MuniCat  
Coordinator  
and Professor  
at the TUM



# 35

Since its start in 2010 35 Ph.D. students have worked at MuniCat.

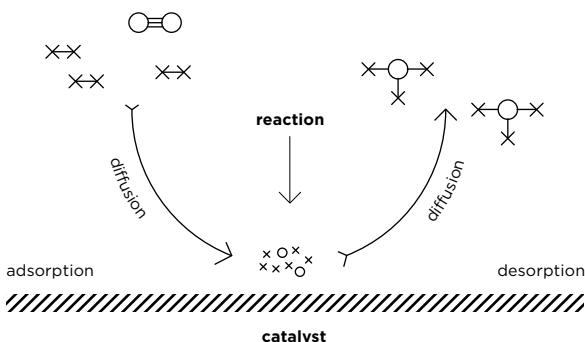
## What is it that TUM brings to the table for Clariant?

**GERHARD MESTL** Ms. Sanchez-Sanchez and her colleagues at the university work on an entirely different scale. They can try out many more catalysts than we ever could. In order to optimize a catalytic process, you could vary the concentration, the time, the temperature, the pressure as well as any of the materials involved. That gives you a lot of variables and a vast spectrum of possibilities to get lost in. So their work here at the university in mapping that spectrum of possible catalyst formulations helps us avoid a lot of trial and error on a much larger scale.



### WHAT IS CATALYSIS?

In the most general terms, catalysis describes a chemical reaction being boosted by an additional substance. The catalyst itself is not consumed by the reaction. Catalysts are used in industrial applications to speed up reactions, reduce the energy required or to achieve higher yields of the desired product. Many of the reactions employed industrially today would be either physically impossible or uneconomical without the use of specialized catalysts. Maximizing the effect, increasing the selectivity (meaning the desired yield without by-products) and extending the lifetime of a catalyst are an exacting science - and a lucrative one at that.



**MARICRUZ SANCHEZ-SANCHEZ** Keep in mind though that we don't just try out all the possible permutations. By analyzing what works and how, we can identify the most relevant parameters. That helps us to better focus our experiments on promising areas.

**GERHARD MESTL** I also believe that innovation only happens when bright minds get together and exchange ideas. We benefit greatly from our discussions with Ms. Sanchez-Sanchez and her team here at TUM. Through MuniCat we also gain access to people and scientific resources that even a global company such as Clariant could never maintain in-house. For example, the level of catalysis research we do with TUM requires a deep understanding of surfaces and properties down to the atomic level. For that we use electron microscopy and even particle accelerators all over Europe.

## And how, besides the obvious funding, does your research benefit from this cooperation?

**MARICRUZ SANCHEZ-SANCHEZ** This type of industrial research poses interesting challenges to a scientist. It forces us to work within practical constraints and find feasible solutions.

## Doesn't that hinder your work? What about freedom of research?

**MARICRUZ SANCHEZ-SANCHEZ** Working within or around certain constraints has its own scientific merits, I think. And it makes our work more relevant to the outside world.

## Can you give us one example?

**MARICRUZ SANCHEZ-SANCHEZ** Many of the metals used in catalysts today are relatively rare and expensive. So companies try to reduce the amount needed or even entirely replace certain metals with cheaper alternatives.

**GERHARD MESTL** There are also metals that have environmental, social or even geopolitical downsides. Say, if they're only mined in politically unstable regions or under inhumane working conditions. Clariant would never want to rely on such materials.

**MARICRUZ SANCHEZ-SANCHEZ** So while we may try out these materials in the lab in order to learn new things about catalytic processes in general, our primary work in developing new industrial processes will always benefit from knowing what a company like Clariant would or wouldn't want to use.

## How important are your work and industrial catalysis in general for society?

**GERHARD MESTL** It is often said that more than 90 percent of all manufactured goods have seen at least one catalytic step in their creation. Without catalysis, many chemical reactions that we rely on would not be economically viable or even possible at all.



#### A deeper understanding

While actual trials and experimental data yield significant insights and guide research, MuniCat also develops theoretical models to better understand the mechanisms involved.



#### A strong partnership

The research alliance MuniCat is integrated into the new Central Institute for Catalysis Research.

**MARICRUZ SANCHEZ-SANCHEZ** Catalysis could help us solve some of the great problems society or even mankind face today. It may help us use alternative resources both for materials and for energy.

#### Is that what drew you to this field of research?

**MARICRUZ SANCHEZ-SANCHEZ** Of course catalysis is especially appealing because of its potential to help solve big problems. It has a green side too, if you will. It's a powerful tool for many industries. But it also touches on very fundamental questions in science, and provides many interesting puzzles for us to solve.

#### What specific breakthrough would you hope to see catalysis achieve within the coming decade?

**GERHARD MESTL** I don't think we should look for that one giant leap. Some very smart people have been working on catalysis for the past 150 years. So all the easy stuff has been done. Advances and change will come in smaller doses. Just for reference: a single percentage gain in selectivity for a given industrial process can easily result in an extra million dollars per year for a producer. So even gradual improvements in efficiency and new avenues for using more renewable resource will help make our lifestyles more sustainable.

**MARICRUZ SANCHEZ-SANCHEZ** That being said, catalysis is a key factor in recovering CO<sub>2</sub> and directly using it as a chemical resource or for energy. Something like artificial photosynthesis – which some institutes are working on – could have a massive impact, not only technologically but geopolitically. In that sense, catalysis may indeed change the world.

# How Natural Resources Creates Value

**Natural Resources combines businesses that use minerals with those that enable the efficient extraction of minerals, oil, and gas. The fundamental trend driving growth for the segments in this Business Area is the increasing global consumption of oil, metals, and food, which is driven by growth in multiple industries.**

## 1. Creating value through customized products and solutions

Functional Minerals and Oil & Mining Services form two complementary pillars of Natural Resources. Functional Minerals provides customers in the edible oil refining, metal casting, civil engineering, plastic processing, animal feed additive, and packaging industries with essential process additives and adsorbents mainly based on bentonite and synthetic minerals. Bentonites are naturally occurring clays with unique swelling, binding, and adsorption capacities, which are used in a wide range of applications. → **FIGURE 001**

Functional Minerals controls and continuously improves a fully integrated value chain, from the exploration and mining of the bentonites to the processing

of the finished products to the application of associated technical know-how at the customer's operations. This allows reliable fulfillment of individual customer needs with a range of customized products and solutions.

Oil & Mining Services provides innovative chemistry, technology, and service solutions that meet customer needs safely and in compliance with environmental regulations. Oil Services is active in the development, manufacturing, application, and supply of specialty chemicals and services across the entire value chain of oil production. Clariant Mining Solutions is a comprehensive supplier of specialty chemicals to the mining industry, with products ranging from explosive emulsifiers to reagents tailored for increasing the recovery and grade of copper, iron ore, phosphates, and other industrial minerals. Clariant Refinery Services' additives boost lubricity, facilitate cold flow, prevent wax-settling, improve stability and make the heaviest products transportable through depressing pour points.

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### 001 APPLICATIONS

#### Functional Minerals

- Edible oil refining
- Metal casting
- Sediment management

- Additives for animal feed
- Additives for paper and detergent

- Special civil engineering and tunneling

- Stabilizers for the plastics industry

#### Oil & Mining Services

- Specialty chemicals and services, including intelligent chemical management for the oil and gas industry

- Additive applications for refinery industry

- Process chemicals for the mining industry

# 2503

**2503 VERITRAX™**  
sensors operating in  
the oil fields.

## 2. Asia and the Middle East drive demand

In 2017, the two Business Units were exposed to diverging economic trends. For Functional Minerals, Europe showed solid growth, driven by a recovering automotive industry and a stable demand for edible oils. In contrast, the market situation in the Americas was impaired by very good crop quality, which required lower amounts of purification products, and the recession in Brazil. The most dynamic growth occurred in Asia and the Middle East, driven by an increased demand for bleaching earth. Clariant took an important step to meet this demand by enhancing its capacity in the two regions. The new production site in Surabaya, Indonesia, manufactures goods for customers in the Asia-Pacific region and strengthens Clariant's position in this region. The plant increases Clariant's regional **production capacity for bleaching earth by 35%** and allows for the production of a broad portfolio of Tonsil® bleaching earths while cutting lead times, thanks to the sophisticated transport infrastructure. The capacity enhancement is part of a global expansion plan, which also included opening a production plant in Turkey in April 2017 and in Mexico in 2016.

Another business driver for Functional Minerals was the continuously growing demand for low-emission casting products, such as GEKO® LE and ECOSIL® LE. Both are EcoTain® labelled and address the pressing need for many foundry customers to comply with

stricter environmental regulation. As the introduction of a modified binder system in a foundry requires a careful diagnosis of the current situation and an incremental change process, Clariant specialists assist customers in their transition to more environmentally friendly operations.

## 3. Achieving success in a challenging business environment

In 2017, Oil & Mining Services has outperformed its key competitors as the current downturn of the oil industry persists. Even though the oil price slightly recovered in the second half of 2017, it remains volatile. Oil companies have thus been very price conscious vis-à-vis their suppliers. Similarly, the commodity markets served by Clariant's mining customers, such as copper, iron ore, and phosphates, have been under financial pressure, given these commodity prices are only slowly recovering. These challenges require Clariant to focus even more on operational and technological improvements that help customers enhance performance and minimize total cost of ownership. For example, VERITRAX™ Intelligent Chemical Management System addresses the customers' growing need for accessing and visualizing real time information about their operations. Launched in 2017, VERITRAX™ helps customers optimize their chemical management process, which improves asset integrity and their chemical spend. → **PAGE 44**

The scrutiny on the use of Nonylphenol ethoxylates (NPEO) has increased, as they are increasingly considered to disrupt the natural balance of hormones. In Europe, they are already listed as substances of very high concern under the EU Regulation on the Registration, Evaluation, Authorization and Restriction of chemical substances (REACH) with clear sunset dates having been established. Going beyond Europe in a proactive manner, Oil & Mining Services has begun to omit these substances and test alternatives in all relevant formulations globally. To secure a steady supply of alternatives, Oil & Mining Services partners with the Business Unit Industrial & Consumer Specialties, which has already successfully replaced NPEO in several applications.



IDEA TO MARKET

### 3.1. Pooling knowledge to create game-changing solutions

By conducting thorough market analyses, engaging in ideation workshops with key customers, and working jointly with Clariant's Group Technology & Innovation, Natural Resources can develop tailored solutions that meet the most pressing customer demands. For example, Functional Minerals has developed TONSIL® Supreme 178 FF, which rids palm oil of fatty acid esters more effectively than competing solutions, and allows processors to use palm oil in baby food and other highly sensitive products. The Business Unit also ran major scouting projects to identify new business opportunities for bentonite functionalities in the construction area and it developed high thermal stability foundry binders for the Brazilian and Asian markets. These binders suffer less deactivation during the contact with the hot metal, thus leading to lower binder consumption and significantly improving the customers' cost performance.

In 2017, Oil & Mining Services launched SCAVINATOR™, a new water-soluble scavenger that controls hydrogen sulfide (H<sub>2</sub>S) and is an alternative to triazine. The product fills an important gap, as the industry has been trying to identify a cost-effective and performance-enhancing alternative to triazine scavengers for decades. A promising indication for the market potential of this new technology was given in the United States, where several customers requested the product for field trials. Another successful example of the innovation capability in Oil & Mining Services was the first field application

of Clariant's Enhanced Oil Recovery Service (EOR) Concept in the Los Angeles Basin. Clariant provided all the chemicals, equipment, and services for this field-wide EOR program, and managed to modestly increase oil production.

Given the challenging business environment, Oil & Mining Services is particularly focused on innovation. The goal is to annually generate **20 to 25% of total sales with innovation projects less than five years old**. Thanks to a market leading technology roadmap and innovation strategy, this ambitious objective was reached in 2017. Oil & Mining Services has fully adopted Clariant's Innovation Excellence methodology and uses the potential of digitalization to further strengthen innovation capabilities. → **PAGE 40** By launching IdeaGen, a digital platform available via a smart phone app, Oil & Mining Services pools the knowledge and creativity of its employees to generate innovative ideas for products, services, processes, and business models.



MARKET TO CUSTOMER

### 3.2. Investigating customer needs to spur growth

Natural Resources is highly focused on maintaining close relationships with customers in order to follow their performance and determine their current and future needs. In 2017, Functional Minerals participated in several trade shows and congresses across all regions. At these events, good practices were exchanged, and customer needs were actively investigated and addressed. For example, Functional Minerals responded to the demand for regionally produced bleaching earth for sunflower oil purification by developing quality products based on local clays and by enhancing the local production capacity with a new plant in Turkey.

Connecting the innovation and marketing processes more effectively was a major goal of Oil & Mining Services for 2017. To this end, the Business Unit formed a dedicated commercialization team in charge of coordinating and managing all aspects of the launch of the new SCAVINATOR™ product. Due to the high number of customer requests for field trials that was received in a comparably short period of time, the approach became a best practice and will similarly be applied to future product innovation launches.

## 20 – 25

**Oil & Mining Services** wants to annually generate 20 to 25% of total sales with innovation projects less than five years old.

# 35

**The new production site** in Surabaya, Indonesia, significantly enhanced production capacity for bleaching earths by 35%.



CUSTOMER TO CASH

### 3.3. Optimizing operations along the value chain to improve cash flow

Effectively managing the supply chain from the suppliers to the customer is key to ensure customer satisfaction as well as profitability. In 2017, Functional Minerals implemented a range of measures to improve its operational efficiency and applied the Clariant Operational Excellence method to the exploration and mining of minerals. By enhancing production capacities in Turkey and Indonesia as well as establishing sun drying opera-

tions in Sardinia and China, it managed to optimize the entire value stream from the mine to the market. Lower energy and freight costs led to significant cost reductions, while improved forecasting and mineral inventories reduced working capital, contributing to an overall higher cash-flow. Furthermore, it installed a new global responsibility for operational excellence to combine the strengths of the regionally structured Business Unit by facilitating the exchange of knowledge and best practices.

**»Deep dives into market needs with Marketing Excellence have provided valuable findings. Disciplined implementation of agreed-upon actions during the win phase ensures that we realize the identified growth opportunities.«**

**Stefan Dick**

Head of Sales EMEA,  
Business Unit Functional Minerals

Oil & Mining Services conducted multiple workshops in the core growth regions North America, Latin America, Europe and the Middle East. They allow gathering input from across the Business Unit to better understand key gaps that exist within the supply chain, such as demand planning and integrated processes and tools. As a result, a global supply chain organization with well-defined processes and standards was established. With the help of the newly introduced »Integrated Planning Landscape«, this global supply chain team manages the complete end-to-end process from demand and inventory planning to sales and operational planning. It also

fosters cross-business collaboration with the Business Unit Industrial & Consumer Specialties, with a goal of avoiding potential capacity constraints by integrating the sales and operational planning of both Business Units. To further tailor the supply chain to the customers' needs, the global supply chain team improved the demand forecasting of both Clariant's direct and indirect customers. By doing so, Oil & Mining Services will continue to improve its own supply capacities in a forward-looking manner and ensure its on-time, in-full performance into the future.

# 14

**Sales in Natural Resources** rose by 14%, mainly driven by Functional Minerals as well as by organic growth and acquisitions in Oil & Mining Services.

## Targets

**6-7%**

Growth potential per year

**15-17%**

EBITDA target margin

## Performance

### INPUT

**1.9%**

R&D spend of sales

**414**

Raw material procured in CHF m

**> 90**

Active innovation projects

**36**

Production sites

**3 349**

Number of raw materials procured

### OUTPUT

**1 357**

Sales in CHF m

**14%**

Growth in local currencies

**15.3%**

EBITDA margin before exceptional items

**3.11**

Production volume in m t

## People

### INPUT

**35 174**

Training hours

**1 737**

Raw material suppliers

### OUTPUT

**3 454**

Staff in FTE at year end (2016: 3 235)

## Planet

### INPUT

**881**

Energy consumption in m kWh

### OUTPUT

**103**

Waste in thousand t

**93**

Greenhouse gas emissions in kg/t production



# Delivering Solutions

## A game-changing product for the oil and gas industry shows how Clariant's new approach to innovation bears fruit.

It's only a few minutes from Thiago Nogueira's office near Macaé to one of Brazil's beautiful and seemingly endless beaches. However, Nogueira, like most of the economy around Macaé, is focused on natural riches a bit further out to sea. Offshore oil and gas production in the nearby Campos Basin and neighboring Santos Basin have driven economic growth since the 1970s. During this time the city of Macaé, up the coast from Rio de Janeiro, has tripled in size. It has the highest average wage in the country. The Campos Basin accounts for 49% of Brazil's oil output, the Santos Basin for another 45%. Brazil produces around 2.6 million barrels of oil per day and another 113 million cubic meters of natural gas.

Thiago Nogueira works for Clariant's Oil & Mining Services Business Unit, which provides the industry with custom chemicals and services that help extract oil and gas efficiently and safely from ever-greater depths. Nogueira manages the innovation projects for Clariant's Oil Services in Latin America. In almost two decades with the company, he has worked his way up from an application technician working on the platforms themselves while earning his MBA degree in Rio de Janeiro along the way. »I jumped at the chance to work onshore«, he says. »Working on an oil platform is really challenging.« Even though the platforms of the Campos and Santos basins are only between one and two hundred kilometers off the coast, that distance makes a huge difference. »You actually can't see the coast from the plat-

**Thiago Nogueira** left his comfort zone in search of disruptive innovation for the oil industry. He taught his team to do the same.



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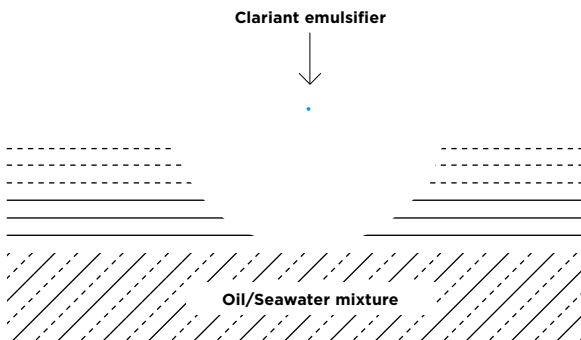
# 17

**Currently active** are 17 Innovation Black Belts throughout all of Clariant's seven Business Units.



### POWERFUL STUFF

The new demulsifier for separating oil from seawater is used in a very low dose, comparable to a bucket of dish soap for an Olympic-sized swimming pool full of oil.



form», says Nogueira. »Goods and personnel have to be transported by boat. Even a connection by helicopter takes up to two hours. If the weather allows it at all!« These grievances, however, were precisely what drove the latest innovation by Clariant Oil Services to become a success story.

In 2016, Nogueira and his team had invited a group of experts from a key customer for a joint technical workshop. The energy giant runs most of the oil and gas production along Brazil's coast and is Clariant's largest customer in the region. »We always end these meetings with an open discussion about how things are going and what issues the customers may be dealing with«, Nogueira says. »In fact, I like to ask what they would change about their work if they had a magic wand.« What came up were the logistics of getting Clariant's

much-needed specialty chemicals onto the platforms. Clariant provides custom-tailored products for each platform. Corrosion inhibitors, for example, protect equipment. Flow assurance products prevent oil from forming solids that can block pipelines and demulsifiers help separate the mixture of oil and water that is extracted from below the seabed. Such demulsifiers are used in small dosages measured in parts per million. Still Clariant delivers millions of liters per year to each and every platform. »These products are highly specialized and whose logistics has a really significant impact to safety, product handling, and operational efficiency«, says Nogueira. The customer saw that the importance of logistics was increasing due to new offshore operations of the pre-salt fields that are very distant from the coast.

Taking this feedback to heart, Nogueira assembled a team to find a solution. What they developed is a unique solution. »We've essentially developed a high efficient - low dosage demulsifier«, says Nogueira. »As a result, we've reduced the volume of our product significantly.« The impact of this new product goes beyond volume savings. It has a ripple effect throughout the whole logistics chain. Less product means fewer offshore tanks, fewer shipments, less handling, fewer movements by crane or forklift, smaller inventory and less space used on the platforms. It reduces the load on the platform and the amount of flammable products stored there. As a bonus, extensive field tests with the customer have proven that the new process is even more effective in separating oil from water. »We take pride in being

**»Fail fast! You want to try new ideas, but you have to learn to cut your losses early.«**



**Thiago Nogueira**

Head of Application Development for Oil Services



**INTERVIEW WITH NORA SCHIEFENHOEVEL,  
HEAD OF INNOVATION EXCELLENCE**



**Why did Clariant set up a team for Innovation Excellence?**

Innovation is vital to the company. Without a well-filled and successfully executed innovation pipeline, Clariant won't be able to achieve its goals in terms of growth and profitability. So using a strategic approach and establishing best practices in innovation globally makes a lot of sense.

**What's the main change that Innovation Excellence brings?**

We put our customers and their unmet needs at the center of the entire innovation process. In practice, this means that the potential value to our customers drives our decisions at every stage, from coming up with an idea to marketing the finished product.

**How does your team help implement this approach?**

We support Business Units in analyzing and shaping their particular innovation strategy and in managing the innovation portfolio to optimize value creation. We've designed tools and a stage-gate process that enable them to run their project in a structured and focused way. And probably most importantly, we coach the people involved in key innovation projects and promote a mindset of customer-focused innovation.

**How rigid is this stage-gate process?**

It's a very helpful framework to reduce uncertainty and to ensure fail cheap. It provides structure but also allows for discovery and serendipity. Both are essential for innovation. If we want our employees to think like entrepreneurs and to try new things, we have to allow for failure. That's also part of a healthy culture of innovation. The key is to fail fast and to learn from failure.

**Where do you see today's Innovation Black Belts in the future?**

We are by design a part of Clariant's effort to promote talent and leadership. And I see today's Innovation Black Belts as pillars of a culture of innovation in tomorrow's leadership.

problem solvers capable to take a holistic view of our customer's operations when approaching their challenges, like this logistics example, with the shared goal to increase production output«, comments Nogueira.

»To me, developing such a unique solution for a problem that we've identified together with our customer is the epitome of what we strive for at Clariant: to bring real value to the market«, says John Dunne, Head of Clariant's Oil & Mining Services Business Unit. It's also a

great example of how Clariant Innovation Excellence drives such projects. In 2011, this company-wide initiative and its dedicated team set out to establish a more structured and strategic approach to innovation. »Innovation is a strategic pillar for Clariant«, says Nora Schiefenhoewel, Head of Innovation Excellence. »Our team promotes structured management for innovation projects that helps balance discovery and delivery by strongly focusing on customer needs.«

Thiago Nogueira is one of 17 Innovation Black Belts currently active at Clariant. These people are specifically trained to manage innovation projects with a certain degree of complexity, duration, costs, and revenue expectations. After an extensive assessment, Nogueira underwent three weeks of training in Frankfurt, Germany in 2014. Back then he was the only participant without a background in R&D. Nowadays, the program is increasingly branching out to more and more employees straddling the line between R&D and business. That's no coincidence. »One of the key elements in Innovation Excellence is putting the customer at the center of the innovation process«, says Nogueira. »Using open questions during our workshop with the customer are actually tools that I've learned as an Innovation Black Belt.« They're part of what's called the scout stage, one of four main stages of the Innovation Excellence approach: scout, scope, execute and commercialize. These stages are all followed by so-called gates, decision points at which a committee decides whether or not to go ahead with the project. Nogueira's job was to guide his team through all of these stages if possible. »One of the tenets of our approach is to ›fail fast«, Nogueira explains. »In innovation, you want to try new ideas, but if those don't deliver, you have to cut your losses early.«

Innovation Black Belts like Nogueira take a unique position in Clariant's corporate hierarchy. They step outside their usual functions and careers to guide the most promising innovation projects. Then, after three years they usually either re-integrate into their former organization or transfer to the Innovation Excellence group in order to coach other Black Belts in training. Nogueira says he will stay with his Business Unit in Brazil. »This experience has changed the way I think about business and innovation. It has taught me to leave my comfort zone in search of disruptive innovation before someone else does – and how to get my team to do the same.« His new product is set to revolutionize an essential part of offshore oil production well beyond Brazil's coast. Meanwhile, what he has learned in Innovation Excellence is set to shape a whole generation of managers like him at Clariant and how they approach new ideas.

## 10

**Class 1 innovation** projects that each have an estimated annual market value of CHF 10 million or more.

# How Plastics & Coatings Creates Value

**Plastics & Coatings is comprised of three Business Units that serve markets ranging from packaging, consumer goods, medical and textile to transportation and agriculture. It serves multinationals, as well as regional and local customers. With such a broad scope, the overall growth potential of Plastics & Coatings is strongly linked to global gross domestic product growth.**

## 1. North America and China drive growth

Additives is a major supplier of flame retardants, polymer additives, and waxes for functional effects, for example in plastics, coatings, printing inks, adhesives, textiles, and fibers, improving heat, light, and weather resistance, among other benefits. This Business Unit also offers innovative and sustainable products such as patented non-halogenated flame retardants, which provide environmental benefits for electrical and electronic equipment.

Masterbatches offers color and additive concentrates for a range of polymers as well as small-lot color compounding for engineering and high temperature resins, widely used in the plastics industry. The Business Line Healthcare Packaging offers controlled atmosphere-packaging solutions for the pharmaceutical industry to protect products from moisture and oxygen.

Pigments supplies organic pigments, pigment preparations, and dyes that meet the high standards for colors in industrial, decorative, and automotive coatings. It also provides solutions for the plastics industry and applications such as home and personal care, aluminum, seed treatment, and stationery. Solutions for traditional printing as well as inkjet and toner applications complete the portfolio of Pigments.

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### 001 MAIN APPLICATIONS

#### Business Unit Additives

- Flexible packaging films reducing waste and increasing recyclability
- Light and heat stabilization, flow properties improvements
- Light and thermal control of agricultural films for improved crop yield
- Waxes, flame retardants and polymer additives with functional effects in plastics, coatings and printing inks, adhesives, textiles and fibers and other applications

#### Business Unit Masterbatches

- Color and additive concentrate solutions for plastics processing
- Concentrates for functional packaging, medical devices & pharmaceutical packaging
- Protection against moisture and oxygen in drug packaging
- Small lot color plastic compounds for the use in automotive, electrical and electronics markets

#### Business Unit Pigments

- Applications for conventional printing inks, inkjet inks, and electrophotographic toners
- Coloration of plastic applications
- Decorative, industrial, and automotive coatings
- Special applications

Sales in **Plastics & Coatings grew by 5%** in local currency, driven by North America and Asia – particularly China – which have strongly contributed to growth. This was enabled by increased commercial and technical capabilities in these regions, as well as expanded capacities of existing sites and investments in new facilities in China.

## 2. Global megatrends and regulations impel business transformation

In 2017, global megatrends continued to increase demand for the plastics and coatings industry. Population growth and urbanization pose huge challenges for food security, increasing the need for more effective food preservation packaging solutions that deliver extended shelf life, and requiring new solutions for crop protecting plastic films. Clariant addresses these needs with its **AddWorks® AGC** portfolio of ready-to-use plastic additive solutions, which are based on Hostavin® NOW, an innovative light stabilizer technology. This enables agricultural film producers to develop products that offer extended film service life and don't need to be replaced as often as conventional films, thereby reducing their environmental impact.

Changing lifestyles amplify connectivity and urge miniaturization of electronic devices, while sustainable mobility demands lightweight and low-emission technologies, as well as smart grids and traffic control systems. The mobility trend towards lower weight in cars

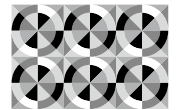
increases the use of plastics and composite materials. Electric vehicles have new safety requirements. In addition, cars have an increasing amount of electronics on board for connectivity and convenience. In all these areas, polymer additives and flame retardants offer unique value contributions.

In 2017, Pigments developed Telasperse™ PVC, a new range of phthalate- and lead-free pigment preparations that allow the PVC processors to increase their productivity, while reducing the coloring costs in a more environmentally sustainable production process.

Stricter environmental regulations are driving innovation. For Additives, the increased awareness of fire safety in emerging economies is opening new opportunities for the development of safer flame retardants. Masterbatches is facing new customer requirements, given the intensified regulations on food packaging. Pigments is experiencing stricter regulations regarding the lead content in paints, particularly in Latin America, where the **growth potential for lead-free organic pigments** is estimated at approximately 10%. Furthermore, more stringent enforcement of regulations regarding the emissions of Volatile Organic Compounds (VOC) is creating particular challenges in the coatings industry in China, requiring Clariant to create new sustainable solutions. → **PAGE 162** In 2017, the new Hostatint™ UV range was launched, a complete color range of high-performance colorants for UV-cured wood coatings.

# 5

**Sales expanded** by 5% in local currency in Plastics & Coatings.



**AddWorks® portfolio** offers performance additives solutions designed to address specific needs of the plastics and coatings industry.

# 10

**Lead-free** organic pigments present a huge growth potential of approximately 10%, especially in Latin America.

# 100

**Plastics & Coatings** ran more than 100 active innovation projects in 2017.



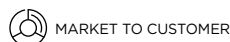
IDEA TO MARKET

## 2.1. Translating innovation capacity into high-performance products

In Plastics & Coatings, **more than 100 innovation projects** were active in 2017. Clariant's sophisticated innovation infrastructure → **PAGE 40** enabled for example Additives to successfully launch renewable-based waxes under the brand Licocare® RBW in 2017. This diverse product portfolio offers high performance in various applications, including coatings and inks, polish and care, agricultural coatings, and plastics processing. Based on a secure supply of renewable, non-food source and with consistent quality and versatility, it presents a direct alternative to natural hard waxes and fossil-based waxes.

In 2017, Masterbatches focused on accelerating innovation projects at the Project House facility, a global masterbatches focused innovation facility located in the Milan area, and in its global network of application centers. For example, Project House has made significant progress in the field of food preservation solutions that Clariant intends to commercialize soon. Using the strong experience and know-how in the laboratory in Ahrensburg, Germany along with a market leadership position on chemical foaming agents for specialized applications, Masterbatches developed a breakthrough chemical foaming solution that is used in extrusion blow molding for bottles. This technology enables weight reduction of bottles, translating into significant savings of material usage and costs.

After implementing a new innovation strategy in 2016, Pigments focused on further adapting the innovation governance by adopting a stringent stage-gate process in 2017. Stage-gate meetings are now held monthly, which allows for a prompt presentation and evaluation of new business opportunities, ensures a regular project status review, allows early escalation of hurdles and leads to an overall accelerated time-to-market. An example of the successful innovation capability of Pigments is the launch of a new, chlorine-free magenta pigment for digital printing (Toner Magenta F9B). The new pigment's color shade is significantly closer to the desired magenta than competing products, avoiding the need for expensive mixing.



MARKET TO CUSTOMER

## 2.2. Creating value for stakeholders through collaboration

With the objective of further improving customer centricity, Plastics & Coatings emphasizes close customer interaction, joint project work, and collaboration along the value chain. Additives conducted regular ideation workshops with both direct and indirect customers to generate a better understanding of unmet needs and identify innovation potential. For example, the technological transition to non-halogenated flame retardants required close collaboration between multiple manufacturers and flame retardants users. Clariant was a driving force in this industry transformation. Clariant is also a

founding member of the Association for Phosphorus, Inorganic and Nitrogen Flame Retardants (pinfa) in Europe and North America and helped establish pinfa in China, the world's largest flame retardant-producing country and end-use market.

Pigments also embraces collaboration to strengthen its customer focus. In response to the increased food safety requirements related to food contact packaging, the Business Unit engaged in workshops with companies along the value chain. By understanding the needs of brand owners for food packaging colorants, Clariant can enhance its value-based selling activities. This enables Pigments to develop differentiated solutions that help counteract the commoditization trap of the market.

Masterbatches focused on streamlining the Market to Customer process to simplify customer interaction and increase customer retention rates, by analyzing the factors influencing individual retention rates in each country and following-up with adequate measures to improve them. In 2017, Masterbatches concentrated mainly on growth in the engineering and high-temperature resins business, the solution-oriented additives business, and the healthcare sector. It launched PLASTIWARD™, a new plastic-based brand-protection system that serves the pharmaceutical industry by improving the anti-counterfeiting efforts for high-value drugs, which was developed in collaboration with Swiss security ink producer SICPA. PLASTIWARD™ is also being expanded into other markets. → PAGE 112

As Clariant's largest Business Area primarily operating in saturated markets, Plastics & Coatings has been steered toward higher absolute EBITDA and cash generation since 2016. This successful path continued in 2017. Differentiated steering enabled the three Business Units to focus on expanding their reach to markets and customers. Additives aligned its Business Lines and regional sales units along focus segments within Plastics, Coatings, and Consumer Markets to achieve a stronger customer and growth focus. The product portfolio of **EcoTain®** labeled sustainable additives for plastic and coating applications were expanded. Pigments fostered cross-functional collaboration between the sales, supply chain, and operations departments, and developed a product calculator to easily determine the product prices that optimize profit margins. Masterbatches continues to focus on higher sales growth to optimize revenues and plant utilization rates across the world.



CUSTOMER TO CASH

### 2.3. Improving supply chains to efficiently fulfill market demands

One major goal for Plastics & Coatings in 2017 was to further improve the product availability for customers while keeping inventories highly efficient. An important tool for aligning all the steps in the Customer to Cash process is the Integrated Planning Landscape (IPL), which was introduced in 2016 in the Business Units Additives and Pigments. The tool helped Additives con-



ECOTAIN®

65

The portfolio of Plastics & Coatings includes 65 EcoTain® labeled products.

**»Our Idea to Market process is crucial to value-driven growth. Ideation and expertise to translate this into products and solutions are essential for sustaining our business and profitability.«**

**Mayendran Pillay**

Head of Global Marketing & Innovation,  
Business Unit Masterbatches



# 3

**Additives announced** three new production facilities in China.

solidate all Business Lines and regional supply chain responsibilities in one professionalized supply chain management organization that enables transparent planning, faster responsiveness as well as higher efficiency and customer orientation. Pigments continued to develop its global IPL by implementing the SAP Advanced Planning & Organization software, which fully integrates supply chain flows from the procurement of raw materials to the customer demand. With the support of Clariant Operational Excellence, Masterbatches implemented the Inventory Health Check (IHC) methodology, which allows the local teams to optimize inventory levels based on elaborate data and market analyses. In 2017, it also implemented SAP in North America to streamline operations, supply chain management and drive optimized business processes that will lead to improved supply chain performance. → **PAGE 64** At the same time, Pigments was working on the adoption of the IHC methodology in Europe over the course of 2017.

To make sure the market demands for Plastics & Coatings products are efficiently fulfilled, the Business Area continued to expand capacity all over the world. Masterbatches invested in a new production site in Cuddalore, India to serve the healthcare packaging business line and ensure short lead times, competitive pricing,

and a close relationship with the growing customer base on the subcontinent. Masterbatches implemented new production lines for engineering and high-temperature resin compounding in Europe, China, and the United States. A new line will also installed in Lewiston, Maine, USA dedicated to compounding for healthcare applications. The Business Unit also built new capacity for white masterbatch in Europe and opened a dedicated white masterbatch facility in Saudi Arabia in January 2018, both of which are already operational.

Additives announced **three new production facilities** in China, the biggest market for additives. Two production units will focus on offering performance additive solutions for packaging, agro-films, automotive applications, and micronized waxes for various coatings & inks applications. The third site, a joint venture between Clariant and Tiangang Auxiliary Co. Ltd., will come on stream in 2019 and manufacture process and light stabilizers for the growing local industries. The new sites will help Clariant serve the Chinese market faster and more flexibly. Expansions in Europe will enable faster growth out of Clariant's existing plants. Pigments continued to optimize the product allocation within their production network. This led to higher production capacity and product availability, resulting in improved customer service.

## Targets

^ **global GDP**

Growth potential per year

**steered for absolute EBITDA and cash flow generation**

## Performance

### INPUT

 **1.3%**

R&D spend of sales

 **1068**

Raw material procured in CHF m

 **>100**

Active innovation projects

 **60**

Production sites

 **14101**

Number of raw materials procured

### OUTPUT

 **2678**

Sales in CHF m

 **5%**

Growth in local currencies

 **14.5%**

EBITDA margin before exceptional items

 **0.46**

Production volume in m t

## People

### INPUT

 **56153**

Training hours

 **4632**

Raw material suppliers

### OUTPUT

 **6759**

Staff in FTE at year end (2016: 6737)

## Planet

### INPUT

 **1038**

Energy consumption in m kWh







### OUTPUT

 **51**

Waste in thousand t

 **697**

Greenhouse gas emissions in kg/t production

-  Financial capital
-  Intellectual capital
-  Manufactured capital
-  Human capital
-  Relationship capital
-  Natural capital

# Ensuring Trust

## How an innovation in medical plastics is helping fight the dangerous rise of counterfeit pharmaceuticals.

When it comes to counterfeit goods, most people probably think of cheap knockoffs of Rolex watches, Gucci handbags and the like. But there is a much more sinister business model on the rise for counterfeiters. It targets the most vulnerable of customers: sick people. Sadly, plagiarizing pills, not purses, is a big and growing business. Plagiarized pharmaceuticals harm and kill people all over the world. According to PricewaterhouseCoopers (PwC), the annual value of counterfeit goods sold worldwide is around USD 1.7 trillion – more than the GDP of Canada. With a share of USD 200 billion, counterfeit drugs make up the single largest segment.

»Pharma counterfeiting is a low-cost, high-profit business opportunity«, says Mark Davison. He literally wrote the book on pharmaceutical anti-counterfeiting and now runs Blue Sphere Health, a consultancy based in Cambridge, UK. »For counterfeiters there's almost zero R&D cost and certainly no need to seek regulatory approval, like a regular drug company would have to do«, Davison explains. »There's no need to source high quality ingredients or follow any regulatory standards or quality guidelines. There's usually very little need for marketing, because the brand is known. The hard work has been done by the original brand owner. Scanning and printing technologies make copying the packaging and trademark really easy. The only cost, really, is distribution.« And counterfeiters rarely get caught. By some estimates, distributing counterfeit drugs is 10 to 25 times

more profitable than trafficking illegal narcotics.

The resulting numbers are staggering. According to Interpol and the World Health Organization, up to 10 % of all medicines worldwide are fake. In certain regions of the world, up to 30 % of drugs in circulation are fake or substandard, with the highest rates found in poor and developing countries. Sadly, counterfeiters are moving beyond so-called lifestyle drugs, such as remedies for baldness and erectile dysfunction. According to PwC, more than half of counterfeit pharmaceuticals sold today are fraudulent versions of treatments for such life-threatening conditions as malaria, tuberculosis, HIV/AIDS, and even cancer.

The toll in human lives is hard to measure. Some have tried. A team from the University of Edinburgh, commissioned by WHO, found that between 72 000 and 169 000 children may be dying from pneumonia every year after receiving bad drugs. »450 000 people die of malaria each year after taking fake antimalarial drugs«, says Marie-Lyn Hecht, co-author of a 2017 PwC report. It states that fake drugs have been shown to even contain toxic ingredients – anything from rat poison to floor wax. »Developing countries are more affected than developed ones«, says Hecht. »However, counterfeit medicines and medical devices are also a growing problem in developed countries.«

Even in the safest and most regulated markets, at least one percent of all pharmaceuticals in circulation are estimated to be fake. In Germany, authorities confiscated four million counterfeit tablets in 2015 alone. A 2009 survey in the UK showed that one in four physicians had treated patients for adverse effects of drugs bought online. Evermore sophisticated counterfeiters are now also plagiarizing medical devices used to treat

A man in a blue suit and white shirt stands in a factory aisle, smiling. He is leaning against a large industrial machine. The machine has the 'LISTA' logo and 'MEGALIFT FSE' text on it. The aisle is lined with similar machines, receding into the background.

LISTA

MEGALIFT FSE

**Steve Duckworth**  
Head of Global Segment  
Medical & Pharma

# 50

**According to** estimates by the World Health Organization (WHO), 50% of medicines available from internet pharmacies are fakes.

# »Incorporating anti-counterfeit technology into the plastic itself is both intuitive and practical.«

**Steve Duckworth**

Head of Global Segment Medical & Pharma

or manage chronic diseases. A rise in such diseases, aging populations and a growing middle class in many emerging countries have made this sector especially lucrative for counterfeiters. Globally, 6 – 8 % of all medical devices, such as inhalers, catheters and insulin pens, are believed to be fake.

In 2016 Clariant teamed up with SICPA, a fellow Swiss company, to fight this trend. SICPA specializes in security inks as well as other authentication solutions and services. Its products are found in banknotes and passports all over the world. They also help companies protect their products and brands with specially secured packaging and more. Together with Clariant, SICPA has developed an end-to-end system that uses an additive (taggant) that goes into the plastics used for medical devices or packaging materials. »Plastics are important in both medical devices and pharmaceutical packaging anyway«, says Steve Duckworth, Head of the Global Segment Medical & Pharma at Clariant's Business Unit Masterbatches. »An estimated six million tonnes of plastics were used in healthcare in 2016. And we see an annual growth two to three times that of global GDP.« Plastics are versatile. They go into everything from packaging to drug delivery systems, diagnostics and lab ware, syringes, catheters and other medical disposables. »So incorporating anti-counterfeiting technology into the plastic itself is both intuitive and practical«, says Duckworth. That doesn't mean it's easy. Materials and manufacturing processes are tightly regulated. However, Clariant has a long track record of reliably providing compliant color and additive concentrates and compounds for the Healthcare industry.

The key component in PLASTIWARD™ is a special taggant, a unique additive that is detectable only with SICPA's proprietary hand-held detectors. Imagine imbuing a simple plastic with unique DNA. Holding one

of SICPA's electronic devices, which are the size of a marker pen, to any medical device will then show you whether it's made of the original plastic or not. Unlike holograms, security ink or serial numbers on packaging, PLASTIWARD™ becomes an integral part of the actual device itself. »We developed a system that brings authentication as close to the medication as possible«, says Yann Ischi, a director of Product & Brand Protection at SICPA. »It allows inspectors to authenticate – or fake-check – products on the spot, wherever they are. It's all part of a complete system that allows for real-time detection, tracking and investigation.«

In a world with global supply chains, finding fake pharmaceuticals can seem like searching for that proverbial needle in a haystack. Securing evidence and then tracking down the source is even harder. »Counterfeiters are fast. They're agile and they are vigilant«, says Ischi. »By the time you've sent something to a lab, tested it and then sent back the results, the counterfeiters have moved on.« On-the-spot checks make all the difference to inspectors and investigators. »Real-time intelligence is key to uncovering and disrupting criminal operations«, says Benedict Hamilton. He is the Managing Director of Investigations and Disputes at Kroll Inc., a corporate investigations and risk consulting firm based in New York City. Companies from around the world hire private investigators like Kroll to uncover cases of fraud, corruption, embezzlement and, increasingly, counterfeiting. Kroll's own payroll includes former police investigators and prosecutors, computer experts and forensic accountants. PLASTIWARD™ just improved their ability to sniff out counterfeiters. SICPA's detector pens not only immediately identify fakes, they also track the location and the time of the find, making it easier to map cases and find patterns of how those fakes might have entered the supply chain. »With this degree of accuracy, we can quickly and confi-

## 8

**The global share** of counterfeits in medical devices is up to 8%, according to WHO estimates.

dently take positive steps to advance an investigation«, Hamilton explains. For Kroll that involves gathering evidence and building a criminal case against counterfeiters.

But how reliable is SICPA's method and might counterfeiters find ways to replicate it? »SICPA's non-visible taggant is detectable only with a SICPA device«, says Duckworth. »This unique interaction is extremely complex and impossible to replicate for outsiders. Also, the system provides several layers of protection, which are always specifically tailored to the customer's needs and to each product.« For example, not every part of a device needs to be protected. Instead, the taggant may be added only to parts that cannot be easily removed or tampered with. Clariant's own process of integrating the taggant into its masterbatches is subject to strictly monitored protocols as well. »Obviously, we not only follow tight regulations for our plastics in terms of biological safety. The taggant itself has to be kept secure at all times.« Meaning, for example, that no excess material or waste will fall into the wrong hands.

While all this complexity makes PLASTIWARD™ so secure and hard to crack, Clariant and SICPA have worked hard to make its actual implementation as easy as possible. »The taggant has no impact on the characteristics of the material or the devices themselves«, says Duckworth. »It is also designed to have no impact on any manufacturing or packaging processes for our customers. It's biocompatible and falls under the same regulation as common color concentrates used in existing plastic processing for medical devices, so there are no additional regulatory requirements either.«

»Counterfeiters are like deadly viruses«, says Ischi. That may sound like hyperbole, but there are similarities. While pharmaceutical companies build a compliant product life cycle – from research to approval, manufacturing and distribution – counterfeiters set up a parallel life cycle that feeds on both the needs of patients and the work of original manufacturers. »Counterfeiters fill a medical device identical to yours with whatever ingredients they want. They scan your packaging, including your serialized code. Finally, they make the fakes available through online pharmacies or even physical points of dispensation«, says Ischi. »Once these fakes are out there, they pose a life-threatening risk to the patients who trust your brand and rely on your products to stay healthy or even to stay alive.« Ischi mentions FDA-documented cases in which hospitals and healthcare professionals have unwittingly administered fake cancer drugs to patients. »In the end, fakes can kill the patients your company is fighting to heal.« There is an unmis-

# 200

The estimated worth of counterfeit pharmaceuticals sold worldwide each year is USD 200 billion, making pharmaceuticals the most targeted counterfeit market.

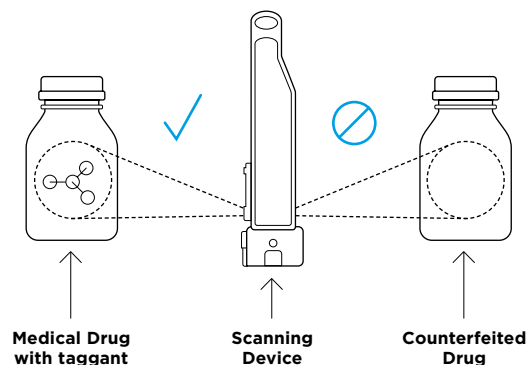
takable zeal to the fight against counterfeit pharmaceuticals. It's not just about brands, margins or markets. Although fakes obviously damage businesses. But it is also about trust – a trust in modern medicine that fake drugs can erode. All too often it can be a matter of life and death. And to some it is deeply personal. »Insulins, injector pens and glucose testing strips are all being counterfeited worldwide«, says Mark Davison. »My son is type-1 diabetic. He relies on these things on a daily basis just to stay alive.«



#### HOW PLASTIWARD™ WORKS



A non-visible taggant is incorporated into the plastic, for example, of a medical device. SICPA's detection pen authenticates original products if the taggant is present. Fakes are identified on the spot with the time and location of the find being relayed online.



**2017 IN NUMBERS**

Long-term value creation drives Clariant. The numbers in this chapter speak of the company's progress in this regard throughout the entire Group. They illustrate a remarkable progress in three dimensions – key performance indicators as well as both social and environmental concerns.

# Review of Results

# 192 000

**Clariant employees** completed 192 000 training hours in 2017.

## 15.3

**EBITDA margin** before exceptional items was 15.3% in 2017.

# 3.2

**Greenhouse gas emissions** (scope 1 & 2 CO<sub>2</sub> equivalent) reduced by 3.2% in 2017.

## 1.8

**Energy consumption** decreased by 1.8% in 2017.

# 302

**Net income** increased by 15% to CHF 302 million in 2017.

## 3.14

**Clariant procured** 3.14 megatons of raw materials in 2017.

## 6 600

**By the end** of 2017, Clariant held 6 600 patents.

# 65

**Sustainability assessments** covered 65% of the spend on raw materials.

# 0.2

**The Lost Time Accident Rate** (LTAR) could be stabilized at a low level of 0.2 days lost per 200 000 hours of work.



# Performance

**Clariant's first brand value – Performance – represents the value creation processes regarding financial, intellectual, and manufactured capital. For the first time, the review of results extends beyond Clariant's financial performance and includes achievements in the fields of innovation and technological advances, digitalization, product stewardship and sustainable chemistry, procurement, and production.**

## 1. Financial capital

In the past business year, Clariant was able to significantly increase its growth and absolute EBITDA before exceptional items, thus achieving the highest sales and profitability since the portfolio transformation. Chief Financial Officer Patrick Jany explains how this was made possible, how the »new Clariant« is positioned, and why the company remains an interesting investment opportunity.

### 1.1. Business performance summary for 2017

Clariant reported Group sales of CHF 6 377 million in 2017 which reflects 9 % growth in local currency as well as in Swiss francs. The strong sales expansion was driven by higher volumes and supported by the Kel-Tech and X-Chem acquisitions in North America as of 1 October 2016 as well as by the full consolidation of the Süd-Chemie India Pvt Ltd joint venture as of 1 April 2017. Organically, the sales grew by a strong 6 % in local currency.

From a regional perspective, sales growth was most pronounced in Asia, the Middle East & Africa and Europe in 2017. In Asia, demand was strongest in China, South-east Asia and Japan. Sales in North America grew while Latin American sales were flat, however, showing signs of improvement in the second half of 2017.

The EBITDA margin before exceptional items increased to 15.3 % from 15.2 % in the prior year. The EBITDA before exceptional items in absolute value was CHF 974 million, which corresponds to an increase of 10 % in Swiss francs versus the previous year. The profitability improvement was attributable to the positive developments in all Business Areas.

Operating cash flow declined to CHF 428 million mainly due to temporarily higher cash out for one-off costs and higher net working capital as a result of brisk demand late in the fourth quarter of 2017 and the anticipated strong demand in the first quarter of 2018, especially in Catalysis.

## 1.2. Profit and financial situation

KEY FIGURES in CHF m

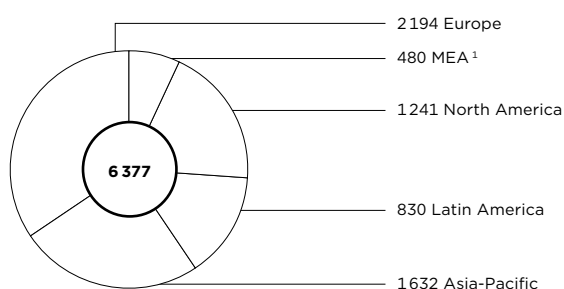
	2017	2016	Change in %
Sales	<b>6 377</b>	5 847	9
Gross profit on sales	<b>1 902</b>	1 770	8
EBITDA <sup>1</sup>	<b>974</b>	887	10
Margin <sup>1</sup> (%)	<b>15.3</b>	15.2	-
EBIT <sup>1</sup>	<b>673</b>	622	8
Margin <sup>1</sup> (%)	<b>10.6</b>	10.6	-
EBIT	<b>496</b>	512	-3
Income before taxes	<b>437</b>	338	29
Net income	<b>302</b>	263	15
Basic earnings per share	<b>0.84</b>	0.78	8
Adjusted earnings per share	<b>1.47</b>	1.12	31

<sup>1</sup> before exceptional items

### 1.2.1. Continued sales growth attributable to higher volumes, acquisitions and full consolidation of joint venture

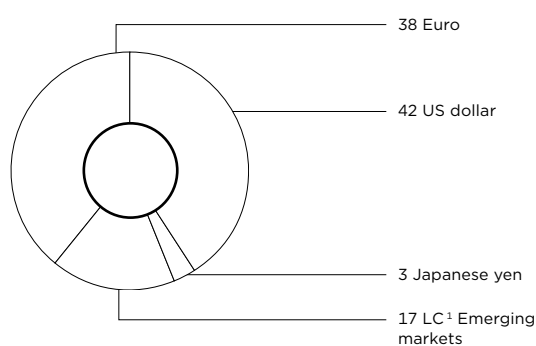
In 2017, group sales surged by 9 % in local currency as well as in Swiss francs against the previous year to CHF 6 377 million (2016: CHF 5 847 million). The strong performance was driven by higher volumes in all Business Areas as well as by the acquisitions in the U.S. as of 1 October 2016 and by the full consolidation of the joint venture in India as of 1 April 2017. Sales increased organically by a strong 6 % in local currency for the year. The strongest organic sales growth was reported in the third quarter, primarily due to an acceleration in demand in the Business Area Catalysis and the good volume growth in Care Chemicals.

001 SALES BY REGION in CHF m



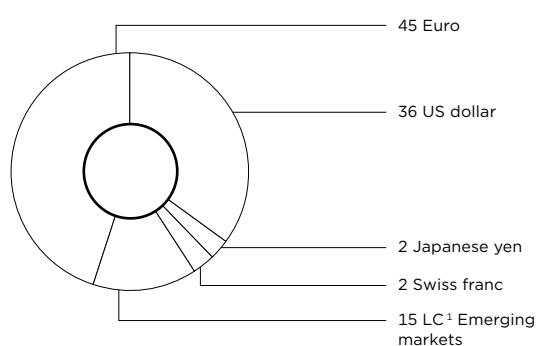
<sup>1</sup> Middle East/Africa

002 SALES STRUCTURE BY CURRENCIES 2017 in %



<sup>1</sup> LC = Local currency

003 COST STRUCTURE BY CURRENCIES 2017 in %



<sup>1</sup> LC = Local currency

SALES BY BUSINESS AREA in CHF m

	2017	2016	Change in %	Change in LC <sup>1</sup> in %
Care Chemicals	1 575	1 465	8	8
Catalysis	767	673	14	13
Natural Resources	1 357	1 184	15	14
Plastics & Coatings	2 678	2 525	6	5
<b>Total</b>	<b>6 377</b>	<b>5 847</b>	<b>9</b>	<b>9</b>

<sup>1</sup> LC = Local currency

### 1.2.1.1. Sales progression driven by improved demand

Sales in the Business Area Care Chemicals improved by 8 % in local currency as well as in Swiss francs. The notable sales development was supported by both the Industrial Applications as well as the Consumer Care businesses. In Catalysis, the weak environment began to recover throughout 2017 and **sales grew by 13%** in local currency (14 % in Swiss francs), with an excellent organic sales expansion of 7 % in local currency. This improvement was driven by higher volumes in all Business Lines. Natural Resources sales advanced by 14 % in local currency (15 % in Swiss francs). The acquisitions in Oil & Mining Services in North America increased sales by 11%. Sales in Functional Minerals grew solidly while Oil & Mining Services reported good single-digit sales growth despite the continued uncertain market trend in the oil business with operating expenditures still being a major consideration for customers. In Plastics & Coatings, sales expanded by 5 % in local currency (6 % in Swiss francs), reflecting attractive sales progression in all Business Units.

### 1.2.1.2. Absolute EBITDA momentum continues in 2017

Clariant's gross margin decreased slightly from 30.2 % in 2016 to 29.8 % in 2017. This development is the result of pricing pressure in some businesses and a slight initial delay in passing on raw material price increases.

Clariant's EBITDA before exceptional items climbed by 10 % in Swiss francs (9 % in local currency) to CHF 974 million (2016: CHF 887 million). The corresponding EBITDA margin before exceptional items rose by 10 basis points from 15.2 % to 15.3 % to the highest level recorded in the past eight years.

The increase in absolute EBITDA before exceptional items reflects the enhanced profitability in all Business Areas. In Care Chemicals, the EBITDA before exceptional items continued to advance (4 % in local currency; 5 % in Swiss francs) while the absolute profitability improvement in Catalysis was most pronounced (23 % in local currency; 24 % in Swiss francs). Natural Resources also rose (3 % in local currency; 4 % in Swiss francs) amid an uncertain market trend and a correspondingly challenging pricing environment in Oil & Mining Services. In Plastics & Coatings, the improvement (5 % in local currency; 5 % in Swiss francs) was realized despite a strong comparable base.

#### EBITDA <sup>1</sup> BY BUSINESS AREA in CHF m

	2017	2016	Change in %	Change in LC <sup>2</sup> in %
Care Chemicals	290	276	5	4
Catalysis	198	160	24	23
Natural Resources	207	200	4	3
Plastics & Coatings	388	368	5	5
<b>Total <sup>3</sup></b>	<b>974</b>	<b>887</b>	<b>10</b>	<b>9</b>

<sup>1</sup> before exceptional items

<sup>2</sup> LC = Local currency

<sup>3</sup> includes corporate costs of CHF 109 m in 2017 and CHF 117 m in 2016

## 13

Sales in the Catalysis Business Area grew by 13% in local currency.

# 15

**Net income** after taxes rose by 15 % to CHF 302 million.

The improvement in the EBITDA margin before exceptional items was primarily attributable to higher profitability in Catalysis, reflecting the strong top-line sales improvement. In Care Chemicals, the EBITDA margin before exceptional items declined mainly due to maintenance shutdowns in various locations in the second quarter, the previously communicated ramp up costs for new capacities as well as a temporary delay in passing on raw material price increases in the first six months of the year. The slightly lower EBITDA margin before exceptional items reported in Plastics & Coatings compares well to a strong result in the same period last year.

#### EBITDA<sup>1</sup> MARGIN BY BUSINESS AREA in %

	2017	2016
Care Chemicals	18.4	18.8
Catalysis	25.8	23.8
Natural Resources	15.3	16.9
Plastics & Coatings	14.5	14.6
<b>Total</b>	<b>15.3</b>	<b>15.2</b>

<sup>1</sup> before exceptional items

Clariant's exceptional items in 2017 amounted to CHF 161 million (2016: CHF 102 million). Restructuring, impairment and transaction-related costs (CHF 180 million) include costs for efficiency programs which were initiated to further streamline business processes (CHF 37 million), an impairment charge (CHF 16 million) and one-off costs (CHF 127 million) which include charges generated by the preparation and filing activities for the cancelled merger with Huntsman.

In 2017, the operating income (EBIT) decreased to CHF 496 million (2016: CHF 512 million) as a result of higher exceptional items.

The negative financial result improved to CHF 59 million from CHF 174 million in 2016 primarily as a result of gains on the sale of securities and interest savings due to the repayment of the EUR Bond in January 2017 as well as changes in the debt profile. Income before taxes increased to CHF 437 million (2016: CHF 338 million) and the **net income after taxes rose by 15%** to CHF 302 million (2016: CHF 263 million), supported by the continued expansion in absolute EBITDA and lower finance costs.

With regard to the performance in 2017 and the prospect of further progression in 2018, Clariant's Board of Directors has decided to propose an increased distribution of CHF 0.50 per share for 2017 to the general assembly. The corresponding proposal will be presented at the 23rd Annual General Meeting on 19 March 2018.

# 428

**Operating** cash flow declined to CHF 428 million.

### 1.2.1.3. Continued solid balance sheet

As of 31 December 2017 total assets decreased to CHF 8 229 million from CHF 8 365 million at the end of 2016, mainly due to the decrease in cash and short-term deposits.

Net debt remained stable at CHF 1 539 million at the end of December 2017, compared to CHF 1 540 million at the end of 2016. This figure includes current and non-current financial debts, cash and cash equivalents, short-term deposits and financial instruments with positive fair values reported under other current assets.

### 1.2.1.4. Long-term structured maturity profile secures solid liquidity structure

In the year 2017, Clariant's financing structure was again on a very sound level. The company has a broadly diversified maturity structure of its financial liabilities with a long-term focus reaching until 2026 and continues to be able to secure this funding with favorable terms.

Current financial debts decreased to CHF 567 million at the end of December 2017 from CHF 957 million at the end of December 2016. A bond issued in 2012 in the amount of EUR 500 million and a bond issued in 2011 in the amount of CHF 100 million reached maturity and were repaid. A bond falling due in 2018 in the amount of CHF 250 million was reclassified from non-current to current financial debts.

The agreement for a CHF 500 million five-year multi-currency Revolving Credit Facility (RCF), which was signed in December 2016, was extended for another year until December 2022.

### 1.2.1.5. Operating cash flow hampered by working capital development and exceptional items

Cash flow before changes in net working capital increased to CHF 759 million from CHF 730 million in the previous year.<sup>1</sup>

Changes in working capital including provisions amounted to CHF – 230 million in 2017 (2016: CHF – 18 million). The ratio of net working capital to sales increased from 18.6% to 20.1%.

Cash flow from operating activities declined for the first time in four years to **CHF 428 million** compared to CHF 646 million in the previous year due to higher net working capital and temporarily higher cash out for exceptional items such as one-off costs.

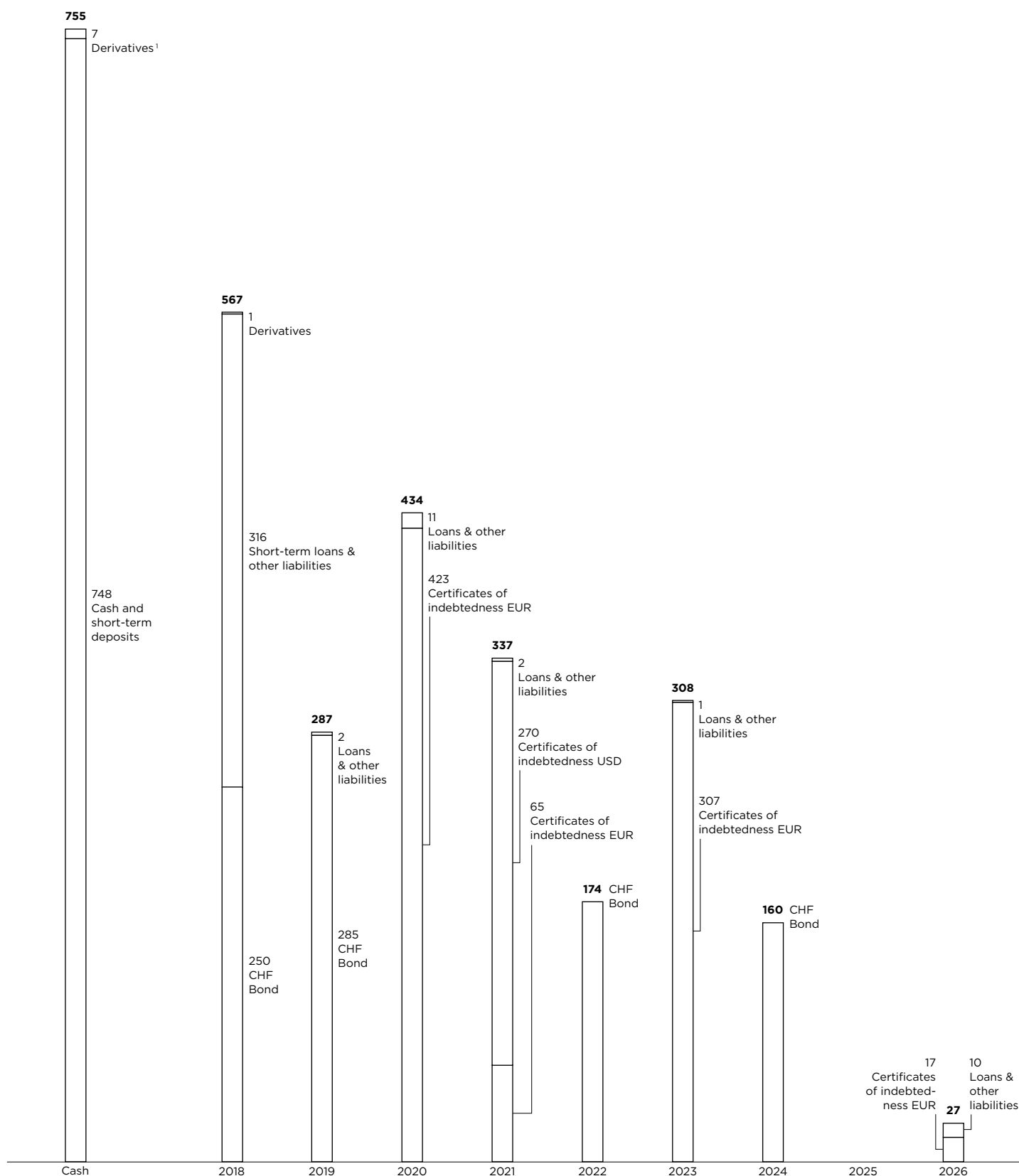
Cash flow from investing activities advanced sharply to CHF 65 million (2016: CHF – 772 million). This figure was mainly influenced by the capital expenditure decrease to CHF 248 million (2016: CHF 297 million) and due to the full consolidation of Süd-Chemie India Pvt Ltd (SCIL).

<sup>1</sup> »Income taxes paid« is reclassified under »Cash generated from operating activities«. In the Integrated Report 2016 it was a part of »Cash flow before changes in working capital and provisions.«

004 DEBT MATURITY PROFILE PER 31 DECEMBER 2017 in CHF m

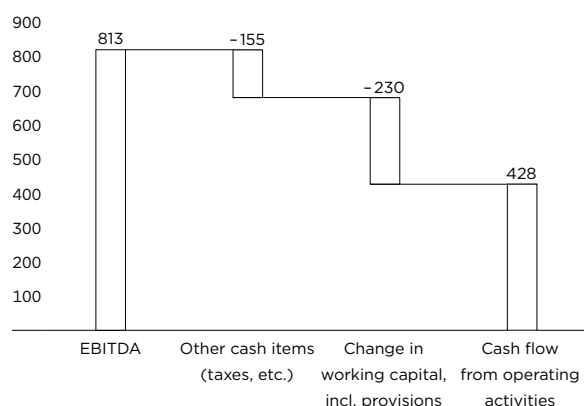
Liquidity Headroom

Maturities of Financial Debt



<sup>1</sup> Financial instruments with positive fair values reported under other current assets

## 005 CASH FLOW 2017 in CHF m



SCIL is treated as a business combination without consideration which resulted in a positive result of CHF 58 million (2016: CHF – 421 million). Free cash flow which equates to operating cash flow after capital expenditures and investments in intangible assets declined to CHF 149 million (2016: CHF 310 million).

Cash flow from financing activities came in at CHF – 826 million (2016: CHF 411 million). The decrease reflects the repayment of financial debt.

## EXTRACT OF CASH FLOW STATEMENT in CHF m

	31.12.2017	31.12.2016
<b>Net Income</b>	<b>302</b>	<b>263</b>
Reversals of non-cash items	452	419
Cash flow before changes in net working capital and provisions <sup>1</sup>	759	730
<b>Operating cash flow</b>	<b>428</b>	<b>646</b>
Cash flow from investing activities	65	- 772
Cash flow from financing activities	- 826	411
<b>Net change in cash and cash equivalents</b>	<b>- 342</b>	<b>254</b>
<b>Cash and cash equivalents at the beginning of the period</b>	<b>1 043</b>	<b>789</b>
<b>Cash and cash equivalents at the end of the period</b>	<b>701</b>	<b>1 043</b>

<sup>1</sup> »Income taxes paid« is reclassified under »Cash generated from operating activities«. In the Integrated Report 2016 it was a part of »Cash flow before changes in working capital and provisions«.

## 1.2.2. Business Areas

### 1.2.2.1. Care Chemicals

#### CARE CHEMICALS KEY FIGURES in CHF m

	2017	2016
Sales	1575	1465
EBITDA before exceptional items	290	276
Margin (%)	18.4	18.8
EBIT before exceptional items	230	221
Margin (%)	14.6	15.1
Full time equivalent (FTE)	2582	2574

- Continued strong growth in both Consumer Care and Industrial Applications
- EBITDA margin before exceptional items hampered by ramp up costs, maintenance shutdowns in the second quarter and some delay passing on raw material price increases in the first six months of the year

Sales in the Care Chemicals Business Area **rose by 8%** in local currency as well as in Swiss francs in the full year 2017. Most regions achieved very good sales growth with Asia, the Middle East & Africa and Europe increasing sales at double-digit growth rates while North America grew in single-digits. Sales in Latin America reflected a negative sales development amid a difficult economic environment mainly seen in the first half of the year which, however, showed an improving trend in the second half of the year.

Consumer Care delivered good mid-single-digit growth with contributions from all three Business Lines: Personal Care, Home Care as well as Crop Solutions. The Industrial Applications business also performed

solidly, with the exception of the Aviation business which was flat compared to the previous year.

The EBITDA margin before exceptional items for the full year 2017 decreased to 18.4%. This decline was primarily due to the previously communicated ramp up costs for new capacities, the maintenance shutdowns in various locations in the second quarter as well as some delay in passing on raw material price increases in the first six months of the year.

For 2018, Care Chemicals expects continued solid sales growth. Clariant continues to focus on the strong market demand for innovative and sustainable solutions. For example, Bluemidin™, an innovative Active Ingredient launched at the end of 2017, protects the skin from the blue light emitted by devices such as mobile phones, TVs and various types of screens which individuals are constantly exposed to. The blue light induces clear and visible signs of fatigue such as eye puffiness and dark circles around the eyes which Bluemidin™ can help alleviate.

### 1.2.2.2. Catalysis

#### CATALYSIS KEY FIGURES in CHF m

	2017	2016
Sales	767	673
EBITDA before exceptional items	198	160
Margin (%)	25.8	23.8
EBIT before exceptional items	135	113
Margin (%)	17.6	16.8
Full time equivalent (FTE)	1970	1548

# 8

**Care Chemicals**  
increased sales by 8%  
to CHF 1575 million.



# 25.8

**EBITDA margin** before exceptional items in the Catalysis Business Area climbed to 25.8%.

- Strong top-line improvement supported by the full consolidation of the Süd-Chemie India Pvt Ltd joint venture as of 1 April 2017
- High EBITDA margin before exceptional items reflects the strong top-line sales improvement

In 2017, sales in the Catalysis Business Area rose by 13 % in local currency and by 14 % in Swiss francs. The full consolidation of the Süd-Chemie India Pvt Ltd joint venture in the second quarter added 6 % to the sales growth in local currency for the full year 2017. All Business Lines contributed to the excellent organic sales expansion of 7 %. The strong sales improvement in the second half of 2017 benefited from a demand upswing in Asia, Europe as well as in the Middle East & Africa. Sales in North America and in Latin America remained comparatively volatile.

The EBITDA margin before exceptional items **increased to 25.8%** mainly reflecting the strong top-line sales improvement. Throughout 2017 Clariant upgraded its outlook for Catalysis as the business began to accelerate. For 2018, we anticipate robust growth in Catalysis driven by Clariant's portfolio strength, innovation capability, global footprint and partnerships as well as driven by the supporting underlying recovery in the Catalysis business environment.

In terms of innovation, Clariant has taken a further step towards the commercialization of bio-ethanol, and the related licenses and enzymes. A new Business Line Biofuels & Derivatives has been set-up and will be part of the Business Area Catalysis from 2018 onwards. Clariant will invest in a new full-scale commercial plant for the production of cellulosic ethanol from agricultural residues using the sunliquid® technology. The plant is anticipated to deliver the first batch of product in 2020.

### 1.2.2.3. Natural Resources

#### NATURAL RESOURCES KEY FIGURES in CHF m

	2017	2016
Sales	<b>1 357</b>	1 184
EBITDA before exceptional items	<b>207</b>	200
Margin (%)	<b>15.3</b>	16.9
EBIT before exceptional items	<b>148</b>	159
Margin (%)	<b>10.9</b>	13.4
Full time equivalent (FTE)	<b>3 454</b>	3 235

- Sales growth driven by Functional Minerals, organic growth as well as the acquisitions in Oil & Mining Services in an improved but still challenging oil market
- EBITDA margin before exceptional items weighed down by the current price consciousness of the oil market

In the Natural Resources Business Area, sales rose by 14 % in local currency and by 15 % in Swiss francs in 2017. Organic growth excluding the acquisitions in the Oil & Mining Service business reflected a 3 % improvement in local currency facilitated by the continued expansion in Functional Minerals and the commencement of a recovery in the Oil & Mining Service business.

The Oil & Mining Services business, excluding the acquisitions, reported single-digit sales growth, despite the fact that the market trend in the oil business continues to remain uncertain with operating expenditures still a major consideration for customers. The business was negatively influenced by market headwinds at the beginning of 2017; however, in the second half of the year the beginning of a recovery pared the weak start and augmented organic sales growth for the full year.

Sales in Functional Minerals expanded at a mid-single-digit growth rate in local currency, with all segments contributing to the business's growth. The positive development was most pronounced in Asia, notably China which reflected a strong sales development, as well as in Europe and in the Middle East & Africa.

In 2017, the EBITDA margin before exceptional items decreased to 15.3 %, weighed down by the current price consciousness of the oil market and weaker demand in the Refinery business which was observed throughout the entire year.

In 2018, Functional Minerals expects to continue growing in emerging markets in particular. The Oil & Mining Services business anticipates growth and continuing improvement in the course of 2018 with attractive long-term industry dynamics.

#### 1.2.2.4. Plastics & Coatings

##### PLASTICS & COATINGS KEY FIGURES in CHF m

	2017	2016
Sales	<b>2 678</b>	2 525
EBITDA before exceptional items	<b>388</b>	368
Margin (%)	<b>14.5</b>	14.6
EBIT before exceptional items	<b>310</b>	289
Margin (%)	<b>11.6</b>	11.4
Full time equivalent (FTE)	<b>6 759</b>	6 737

- Sales expansion within all businesses
- Solid absolute EBITDA margin before exceptional items benefited from the positive effect of high capacity utilization as well as ongoing solid top-line growth

For the full year of 2017, sales in the Plastics & Coatings Business Area **expanded by 5%** in local currency and by 6 % in Swiss francs. In Masterbatches, all regions showed attractive sales expansion, with strong sales growth in Greater China, North America and Europe as well as from the Middle East & Africa region. Sales growth was notable in Engineering and High Temperature Resins masterbatches and compounds and in the Packaging segment.

Sales in Pigments rose in particular in Asia, driven by China and India. On a Business Line level, Plastic Applications and Special Applications reported continued attractive sales growth and are largely attributable for the sales improvement. Additives continued to reflect very strong sales growth which was supported by all Business Lines and also by solid demand in almost all regions, China and North America in particular.

# 5

**Sales** in Plastics & Coatings expanded by 5% in local currency.

The EBITDA before exceptional items rose by 5 % in local currency to CHF 388 million despite a strong comparable base. Plastics & Coatings continued to benefit from the positive effect of high capacity utilization as well as ongoing strong top-line growth.

Plastics & Coatings continues to develop solutions and products for the needs of its end markets. These solutions in combination with the focus on differentiated business steering are expected to continue to enhance growth opportunities in the businesses and to further contribute to the overall performance of Clariant.

### **1.3. Outlook**

#### **1.3.1. Continued progression in growth, profitability and operating cash flow generation**

Clariant successfully increased sales and absolute EBITA before exceptional items in 2017 by focusing on the requirements of its customers and by providing them with enhanced and sustainable solutions to enable them to create further value. Clariant was able to make further progress in becoming an even more profitable and resilient specialty chemicals company. This was achieved as a result of the stringent execution of our strategy by means of innovation, sustainability, portfolio repositioning and seizing growth opportunities.

Clariant expects the good economic environment in mature markets, which represent a high comparable base, to continue. Emerging markets are expected to be supportive with Latin America showing signs of a recovery.

For 2018, Clariant is confident to be able to achieve growth in local currency, as well as progression in operating cash flow, absolute EBITDA and EBITDA margin before exceptional items.

Clariant confirms its mid-term target of reaching a position in the top tier of the specialty chemicals industry. This corresponds to an EBITDA margin before exceptional items in the range of 16 % to 19 % and a return on invested capital (ROIC) above the peer group average.

#### **1.4. Stock market 2017**

The share price development started modestly in 2017 with a share price of CHF 17.57 in January. At the beginning of 2017, the Clariant share price mirrored the general market trends.

The Clariant results for the full year 2016 and the first quarter 2017 exceeded expectations and were well perceived by the financial markets. The share price advanced to CHF 20.18 towards the end of April as a consequence of upgraded analyst recommendations.

In May 2017, the announcement of a planned merger of equals with Huntsman propelled the share price up to CHF 21.59. The initial market reaction was positive and the majority of analysts increased their price targets based on the potential value creation proposed by the merger. During the summer months, the market echo remained positive although political uncertainties in the U.S. and geopolitical tension with North Korea weighed down the share price temporarily.

As a result of the announced merger, Clariant's shares received increased attention from the financial markets. On 20 July 2017, the activist investor vehicle White Tale announced it had purchased a 10% stake in Clariant with the purpose of opposing the planned merger. The share price maintained its positive direction based on high trading volumes and strong quarterly results. On 19 September 2017 the share price reached CHF 23.68 and White Tale announced that their stake in Clariant had reached 15%.

In October 2017, White Tale crossed the 20% threshold and it became increasingly clear that the two-third majority of the represented votes required by Clariant for the approval of the merger at an Extraordinary General Meeting was unlikely to be obtained. On 27 October 2017, Clariant and Huntsman announced the termination of the planned merger with a mutual agreement. The share regained early losses and closed at CHF 25.30. In the last period of the year, the share price continued to increase and closed at its highest level of CHF 28.00 on 27 December 2017. The Clariant shares closed at CHF 27.25 on 29 December 2017.

Clariant has been included in the Dow Jones Sustainability Index since September 2013 which reflects the continued progress made in various fields of sustainability as well as the outstanding, solid performance which has been achieved in economic, environmental and social dimensions. In March 2017, Clariant was

selected to be included in the Swiss Performance Index (SPI®) Select Dividend 20 Index basket. Since the end of November 2017, Clariant has also been included in the MSCI Equity Switzerland Index. Being included in the (SPI®) Select Dividend 20 Index, an index consisting of the top dividend delivering Swiss stocks, and in the internationally renowned MSCI Equity Switzerland Index are confirmation of the success of Clariant's strategy and its positive performance result.

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#### WHY INVEST IN CLARIANT?

1. We are a leading specialty chemicals company.
  2. We serve markets with future perspectives and above average growth rates...
    - by providing solutions to global challenges,
    - by supporting our customers in creating more value,
    - by focusing on the requirements in different regions,
    - by building on our innovation and R&D strategy as well as our sustainability offering.
  3. We strive for financial excellence.
  4. We have a highly experienced management team.
- 

#### 1.4.1. Dividend payment

Clariant aims to increase or at least maintain dividends. Since 2011, Clariant increased the dividend by an average of 9% per annum. The continued improvement in performance allows the Board of Directors of Clariant Ltd to propose a dividend distribution of CHF 0.50 per share for the 2017 financial year at the Annual General Meeting on 19 March 2018. This proposal reflects an increase of 11% compared to the previous year. The distribution is proposed to be made from the capital contribution reserve that is exempt from Swiss withholding tax under certain conditions.

# Increasing Profitability

**In 2017, Clariant achieved very good top-line growth and higher profitability. Chief Financial Officer Patrick Jany explains the business performance and priorities for 2018.**

**Mr. Jany, how satisfied are you with the 2017 results?**

**PATRICK JANY:** 2017 was a good year for Clariant overall. We achieved our growth target and increased sales in almost all Business Areas. This has helped us improve the absolute profitability of the company and to realize real progress. We have not reached all our goals, however. We were not able to fully harness our potential, as we moved too slowly on pricing in the first half of the year. Although the businesses reacted well in the second half of the year, it was a bit too late to significantly increase the margin. The development of the Swiss franc also provided a positive contribution. For the first time in several years, this has allowed us to finally reflect the growth that we have achieved each year in absolute terms.

**What was the primary source of growth?**

A portion of the growth stemmed from acquisitions, but we also grew organically in a healthy economic environment. For example, in Care Chemicals, we saw a very good performance in the high-margin Personal Care and Crop Solutions segments, as well as the somewhat lower-margin products with which we were able to fully utilize our capacities. After a weak start to the year, Catalysis experienced a turnaround in 2017 and posted very good numbers, good growth and profitability. We had actually not anticipated such a significant improvement until 2018/19. We can be quite satisfied with that. As expected, Plastics & Coatings grew at 6% and benefitted from the very good economic growth worldwide. The only Business Area that really suffered in 2017 was Natural Resources. The oil business remained in crisis for the third consecutive year, with a slight improvement noted at the end of 2017.

**In addition to growth, you also planned to increase cash flow in 2017. What was the result of that?**

The 2017 balance sheet certainly was not satisfactory in this respect. Cash comes from growth, profitability and good net working capital management. All three elements are important. Although we made progress with profitability, we were unfortunately unable to convert this into cash. On the one hand we encountered several exceptional items, such as the costs attributable to the Huntsman project, and on the other hand, we must also significantly improve net working capital management within the company.

**So overall, a good year with improvement potential....**

... yes, in 2018, it will continue to be our main priority to generate cash flow. Meanwhile, a second wave of raw material cost increases has arrived, as the oil price moved towards USD 70 at the beginning of the year. This will make our raw material purchases more expensive, which is why we are already raising our prices so as not to miss the opportunity a second time. We assume that we can expect a good economic situation in Europe, the U.S. and China in 2018. Even Latin America is slowly recovering.

**Are China and the U.S. still the regions of focus for investment?**

Yes. In China, we definitely want to grow and will continue to selectively invest in capacity expansion, research facilities and developing the organization. We will also continue to build the One Clariant Campus headquarters. This will all develop over several years; we are still in the start-up phase. We have already invested in new capacities in the U.S., for example, and we now want to see results. In order to increase our market share, we must invest more in our employees and build local expertise. This does not necessarily entail a mul-



# 15.3

**The EBITDA margin -**  
Clariant's key performance indicator for profitability - increased by 10 basis points to 15.3%.

**Patrick Jany**  
Chief Financial Officer

titude of new hires, but it could potentially result in the relocation of standard and routine tasks from the U.S. to our Shared Service Center in India. It is not about reducing headcounts or labor costs, but about providing employees with more time to focus on their core tasks. Outside of China and the U.S., we will continue to invest in innovations, such as the planned bioethanol plant in Romania, which will contribute to the profitability of the company from 2021 onwards.

**The enterprise value increased significantly. Will an investment in Clariant remain lucrative?**

Clariant was a very good investment in 2017: our share price rose from CHF 17.57 at the beginning of the year to CHF 27.25 at the end of the year. In an admittedly favourable environment with rising share prices worldwide, low interest rates and a lack of alternative cash investments, we have also shown that our strategy is working. Of course, in addition to the operational component, the planned merger with Huntsman and the

entry of the activist shareholder White Tale influenced the share price performance. These developments fuelled break-up and takeover speculation which had supported the share price. This speculation was rather negative for long-term shareholders, as it increasingly attracted short-term investors. As a result, in 2017 the share price became more volatile than warranted by the performance of the company itself, which is fundamentally solid. Our plan for the coming years is to gradually increase profitability and thus continue to support the share price development.

We are currently at a turning point. After repositioning the company in recent years, we are now entering a phase where we will generate higher growth, higher profitability and, most importantly, higher cash flow. We also expect this for 2018. Clariant continues to be a good investment for all of these reasons.

# 3.3

**Expenditures on R&D**  
was 3.3% of total sales.

## 2. Intellectual capital

In 2017, Clariant successfully expanded its intellectual capital. The number of patents and active innovation projects increased, new scientific collaborations were established, and new product developments were screened for sustainability. Clariant also progressed on its digitalization journey by embracing the rapid innovation method for developing new digital business models.

### INTELLECTUAL CAPITAL

	2017	2016	Change in %
Patents (year end)	<b>6 600</b>	6 500	1.5
Active innovation projects	<b>&gt; 370</b>	320	> 15.6
Of which Class 1 Projects with double-digit million sales potential or of strategic relevance	<b>&gt; 65</b>	60	> 8.3
Scientific collaborations	<b>&gt; 125</b>	125	0

### 2.1. Innovation and technological advances

Clariant is focused on achieving its growth target by developing innovative and sustainable products based on state-of-the-art technologies. In 2017, Clariant achieved 2.5% growth through its innovation projects, surpassing its 1–2% target. Research and Development spending in 2017 was CHF 211 million, compared to CHF 206 million in 2016. As a **share of sales, R&D spending was 3.3%**, a decrease from 3.5% in 2016 given that sales exceeded expectations, particularly in the fourth quarter. As a result, the relative target of 3.5% was not met. The number of active projects in the innovation pipeline increased from 320 in 2016 to more than 370 in 2017. This was mainly due to the increase in ideation sessions

conducted with suppliers, customers, and partners from academia, as well as a stronger focus on regional unmet needs and high-potential projects involving more than one Business Unit.

The investments in capability building and organizational improvements over the last few years started paying off in 2017. Clariant established shared targets and focused sharply on training, project management, and an up-to-date user-friendly toolbox. State-of-the-art equipment and infrastructure in eight R&D and over fifty Technical Centers built the basis for successful innovation. The increased number of trained innovation belts was a key factor in improving the project pipeline and increasing the number of Class 1 projects (those with a double-digit million sales potential) from 60 to more than 65 in 2017.

After Clariant revised its Intellectual Property strategy in 2015 and 2016, it abandoned patents that were no longer of strategic relevance, leading to an overall drop in the number of patents. Having concluded this strategy adjustment, the number of patents is increasing again, from 6 500 in 2016 to 6 600 in 2017.

In 2017, Clariant increased its innovation footprint in high-growth markets in Asia. It signed a Memorandum of Understanding with the Shanghai University, embarking on a long-term collaboration that will strengthen the link between industry and academia, provide students with the opportunity to gain business exposure, and offer Clariant the possibility of recruiting promising graduates. In the same year, Clariant also hosted the Innovation Fair in Shanghai, which served as a platform to

network and discuss potential collaborations to address Asian market needs with innovative solutions. With these initiatives, Clariant continued to build its reputation as the most innovative specialty chemicals company in China.

## 2.2. Digitalization

In 2017, Clariant took significant steps to further tap into the huge potential offered by digitalization. Clariant's Digital4Clariant program launched at the end of 2016 established three core workstreams. Such workstreams focused on finding business models around digital offerings, improving Clariant's production with digital means, and utilizing the potential of big data and advanced analytics. Clariant realized from day one that topics related to cyber security, legal and tax have the potential to be a show stopper for digital innovation and created corresponding workstreams. The early involvement in particular of legal and tax experts already in the innovation phase proved vital. Clariant's digital innovation approach is inspired by rapid innovation methods widely used in the technology sector and incorporates elements of design thinking, agile project management and SCRUM.

To guarantee new solutions satisfy customer needs, Clariant starts its innovation sprints with customer interviews and continuously refines ideas with customers. As a principle, ideas are also rigorously sorted out embracing the spirit of fail fast, fail early, fail cheaply. For instance, three Business Units that ran digital sprints led more than **80 customer interviews**, follow-up calls and pitches, developed more than 200 idea seeds, discarded more than 20 already more refined ideas, and incubated the remaining ideas in close contact with the

customers. The Digital@Operations workstream identified a suitable way of work to improve Clariant's production with digital solutions: Bringing on digital change in operations is not only about technology but also about people. This is why Clariant's production system team, with its proven optimization and skill-building track record, will tackle six digital clusters identified by Clariant in 2017. The six clusters identified as particularly promising are predictive quality control, predictive maintenance, digital material flow, connected workforce, retrofitting, and robotics.

## 3. Manufactured capital

In 2017, Clariant continued its efforts to make the product portfolio more sustainable, awarding 18 products the EcoTain® label for outstanding sustainability performance. It also increased the share of renewable raw materials in procurement, underscoring the commitment to sustainability throughout all business activities. Clariant expanded production capacity with several new facilities and considerable investments in high-growth regions, such as China.

# 80

**Three Business Units** ran digital sprints and led more than 80 customer interviews.

### MANUFACTURED CAPITAL

	2017	2016	Change in %
EcoTain® awarded products	18	46	-60.0
Research & Development Centers	8	8	0.0
Technical Centers	> 50	> 50	-
Countries with production facilities	39	40	-2.5
Production sites	125	120 <sup>1</sup>	4.2
Raw materials procured (in m t)	3.14	2.82	11.3
Production (in m t)	4.60	4.09	12.5

<sup>1</sup> Restated to show all production sites instead of production sites in performance reporting scope only



### 3.1. Product stewardship/sustainable chemistry

Protecting customers, consumers, and the environment by providing safer and more sustainable solutions is one of Clariant's top priorities. Therefore, ensuring compliance for its products is key. Product Stewardship contributes to the safety and legal compliance of products through carefully managed assessment, testing, and customer engagement processes.

Clariant's approach to product stewardship is globally oriented. Local and regional Product Stewardship teams are an integral part of a Global Product Stewardship organization, supporting business and external customer communication. Clariant also monitors and assesses the impact of changes in chemicals management regulations worldwide in order to be prepared for any shifts in the regulatory landscape.

Clariant is fully committed to the REACH targets: the company continuously prepares and submits required information for the successful registration of substances that are under the scope of the third phase of the EU REACH regulation. Clariant has put in place clear targets and management processes to meet the upcoming May 2018 registration deadline. In 2017, information for 85 % of all relevant substances was submitted. Clariant is on track to register 100 % of applicable and relevant substances in 2018.

Clariant goes beyond mere compliance: In a Cefic (European Chemical Industry Council) LRI (Long Range Research Initiative) project, its Toxicology & Ecotoxicology group has initiated and co-developed the so-called AMBIT tool — a new IT-based system on a predictive toxicity model. AMBIT helps predict the unknown properties of one chemical using the known properties of similar chemicals. The European Chemicals Agency

(ECHA) supports this tool by giving access to non-confidential registration data.

Beyond product safety, screening for sustainability is a mandatory step for all major product development projects at Clariant. Under the Portfolio Value Program (PVP), Clariant systematically assesses its product portfolio for strengths and weaknesses in terms of sustainability by taking impacts across the entire life cycle into account. The product portfolio is screened for sustainability performance on 36 criteria that consider all three dimensions of sustainability: performance, people, and planet. Clariant awards products that show an excellent sustainability profile based on the PVP criteria with its EcoTain® label. These products are nominated by Business Units and undergo the scrutiny of the internal EcoTain® panel, comprised of representatives from Corporate Sustainability & Regulatory Affairs (including relevant Product Stewardship experts), Group Technology & Innovation, and Group Communications.

In 2017, 18 products were awarded the EcoTain® label, bringing the total number of Clariant products branded with this sustainability excellence label to 169. As for the overall product portfolio, Clariant announced in its Sustainability Dialog held in Frankfurt in 2015 that 80 % of its product portfolio had been screened for sustainability performance since the inception of the program in 2012. This evaluation determined that 75 % of the product sales being considered meet Clariant's sustainability definition, while 25 % are targeted for improvement opportunities. Roadmaps for these improvement opportunities include, among other objectives, a focus on reducing hazardous substances across the Clariant products portfolio. As examples, in 2017 Clariant's Business Unit Oil & Mining Services began to proactively offer alternatives to the use of nonylphenol-ethoxylates,



**GRI Online Report**  
Management Approach  
Product Stewardship  
and Sustainable  
Chemistry  
[reports.clariant.com/  
2017/gri](https://reports.clariant.com/2017/gri)

# 4.6

**Total production volume** increased by 12.5% to 4.6 m t.

in anticipation of possible future regulatory requirements. In 2015, Clariant's Business Unit Masterbatches committed to gradually phase out the use of heavy metal-based pigments in its masterbatches and offer its customers alternatives. Progress is ongoing, with phase-out already achieved in Europe and North America in 2016 and good progress in several sites in the regions Latin America, Middle East, Africa, and Asia Pacific during 2017. Focus and progress will continue in 2018.

During 2017, the EcoTain® label was further promoted. At the request of customers and in a joint effort to bring more sustainable products and solutions to the market, customers purchasing EcoTain® products piloted and successfully launched the use of the EcoTain® label on their own products during 2017. By highlighting their use of EcoTain® as a sustainable ingredient in their offerings, Clariant's customers are supporting the growth of the brand. This initiative illustrates the recognition given to the EcoTain® label and Clariant's work in positioning and offering safer and more sustainable products to the market.

To further roll out their initiative to promote sustainability in the market and society in general, Clariant is also piloting **EcoTain® Partnerships**, a standard for establishing value chain collaborations on sustainability. The partnership model outlines criteria for ensuring business and sustainability benefits and will be launched to the public in 2018. For an example of model elements, please see the SPOTS project. → **PAGE 149**

### 3.2 Production volume and products

In 2017, production volume, which represents finished goods that left production sites and were sold to customers, **increased by 12.5% to 4.60 m t**. With 3.11 m t produced goods, Business Area Natural Resources ac-

counts for around two-thirds of the total production volume. While all four Business Areas contributed to the rise in total production volume in 2017, additional production of 0.34 m t by Business Area Natural Resources is responsible for the largest share. Business Area Care Chemicals was able to increase its production volume from 0.95 m t in 2016 to 0.96 m t in 2017. Compared to the previous year, Business Area Plastics and Coatings enlarged its production volume by almost 40% to 0.46 m t and Business Area Catalysis by 50% to 0.06 m t. More than 40% of production volume is manufactured in plants that implemented an ISO 50001 certified energy management system.

### 3.3. Raw material procurement

The use of renewable materials is increasingly important in the chemical industry due to the growing demand from customers and consumers. As a sustainability leader in the chemical industry, Clariant prioritizes responsible procurement of renewable raw materials, increased use of renewable raw materials in products, and development and production of innovative bio-based chemicals and biofuels.

In 2017, Clariant bought goods and services worth approximately CHF 3.9 billion. Of this, roughly CHF 2.7 billion was spent on raw materials from around 7000 suppliers. Clariant purchased over 36 500 types of raw material, with 35% of the total raw materials representing 20 major commodities and approximately half representing 30 other products. In total, 200 raw materials make up 95% of the purchased volume. Around 23% of the raw materials purchased currently originate directly or indirectly from crude oil, more than 16% are derived from natural raw materials such as bentonite, and 5.8% are from renewable raw materials.



**EcoTain® Partnerships** will be established as a new standard in sustainable value chain collaborations.

# 125

Clariant expanded its production network by 5 new sites to 125 production sites.

Clariant favors purchasing goods and services from the region in which the company or the production site is located, as long as the quality is compatible, and the purchase is technically and economically feasible. In doing so, Clariant's activities support the economic development of the respective regions.

#### RAW MATERIAL PROCUREMENT ACCORDING TO REGIONS in CHF million

	2017	2016
<b>Asia/Pacific</b>	<b>627</b>	<b>510</b>
Of which with local suppliers <sup>1</sup>	591	479
Number of local suppliers <sup>2</sup>	2800	1754
<b>Europe</b>	<b>1237</b>	<b>1088</b>
Of which with local suppliers <sup>1</sup>	1122	959
Number of local suppliers <sup>2</sup>	1690	1174
<b>Latin America</b>	<b>307</b>	<b>276</b>
Of which with local suppliers <sup>1</sup>	209	198
Number of local suppliers <sup>2</sup>	1092	802
<b>Middle East &amp; Africa</b>	<b>109</b>	<b>91</b>
Of which with local suppliers <sup>1</sup>	56	47
Number of local suppliers <sup>2</sup>	407	247
<b>North America</b>	<b>395</b>	<b>255</b>
Of which with local suppliers <sup>1</sup>	359	221
Number of local suppliers <sup>2,3</sup>	1002	445
<b>Grand Total</b>	<b>2674</b>	<b>2221</b>
Of which with local suppliers <sup>1</sup>	2337	1904
Number of suppliers <sup>2</sup>	6991	5222

<sup>1</sup> Spendings on raw materials of Clariant production sites in this region

<sup>2</sup> Regional suppliers that supplied Clariant (production) sites

<sup>3</sup> The increase compared to 2016 is due to the full SAP integration of Masterbatches suppliers in North America

### 3.4. Production sites and innovation facilities

#### 3.4.1. Expanding the production sites network

At the end of 2017, Clariant's production network consisted of **125 production sites** in 39 countries. Compared to 2016, the total number of production sites increased by five: two new sites were opened in the U.S. acquired in 2016 by Business Unit Oil & Mining Services are now included in the reporting, and one site is taken out as it is now only a warehouse activity. In Surabaya, Indonesia, Clariant opened a new bleaching earth production site for its Business Unit Functional Minerals that increases regional production capacity for bleaching earth by 35%. Additionally, the new site's infrastructure facilities make it possible to increase value to customers through shorter lead times. A new site in Bonthapally, India was acquired for Business Unit Industrial & Consumer Specialties in 2016, and is the first time included in the reporting. In Cuddalore, India, Clariant opened a healthcare packaging production site for its Business Unit Masterbatches. The new site not only augments Clariant's production capacity for desiccant canisters, it also adds to Clariant's ability to meet Business Continuity Planning (BCP) requirements of global customers by producing identical products at multiple sites worldwide. As production starts only in 2018 this site is not yet included in the 2017 reporting.

#### 3.4.2. Investments in China

Clariant underscored its commitment to Asia with a multi-million CHF investment by its Business Unit Additives to ensure local manufacturing in China of solutions for the plastics, coatings and inks industries. The

expansion will enable Clariant to shorten supply lead times and deliver customized, high-tech solutions more rapidly in this region. The new facilities at Clariant's well-established site in Zhenjiang are expected to come online in 2018. Clariant also bought land in China's Hebei province, together with Tiangang Auxiliary Co., Ltd., a privately owned producer and leading supplier of light stabilizers, in order to build a production facility for joint manufacturing of process and light stabilizers. Production is scheduled to begin in the first half of 2019 and will initially focus on textile-related stabilizers and solutions for the automotive industry. In 2017, Clariant also came to an agreement with Xuzhou HaiDing Chemical Technology Co. Ltd. to develop a custom-built CATOFIN® catalyst and propane dehydrogenation (PDH) unit in cooperation with its technology partner CB&I. The unit, which will be built in China's Jiangsu Province, is designed to produce 600 kilotons of propylene per year, based on Clariant's CATOFIN® catalytic dehydrogenation technology. → PAGE 20

#### **3.4.3. Further step for the commercialization of bio-ethanol, licenses, and enzymes**

In 2017, Clariant approved the investment in a new full-scale commercial plant in southwestern Romania to produce cellulosic ethanol from agricultural residues using its sunliquid® technology. The flagship plant will have an annual production capacity of 50 000 tons, confirming competitiveness and sustainability of the sunliquid® technology at commercial scale. The plant is anticipated to deliver its first batch of product in 2020. At full capacity, the new plant will process approximately 250 000 tons of wheat straw and other cereal straw

annually. Peak sales from the sunliquid® cellulosic ethanol plant are expected to be in the mid double-digit million range.

#### **3.4.4. New Research & Development and Technical Centers**

Clariant operates a strong innovation infrastructure consisting of eight Research & Development Centers in North America, China, India, and Europe, and more than 50 Technical Centers in Europe, North and Latin America, India, and China. In 2017, Clariant opened its first Competence Center for haircare ingredients in Sao Paulo, Brazil. This Competence Center positions Clariant closer to leading users, producers, and experts of haircare products and enables a better understanding of the varying needs across differing hair properties. In Tokyo, Japan, Clariant opened a new laboratory dedicated exclusively to supporting Japan's Personal Care industry. Located inside the Tokyo Metropolitan Industrial Technology Research Institute (TIRI), the new laboratory offers local customers easy access to technical facilities and expertise to boost their research and development activities.

# People

**Clariant's second brand value - People - encompasses both human and relationship capital. Human capital refers to the value created for all employees through people processes ranging from talent attraction and training to employee engagement and health and safety programs. Relationship capital, on the other hand, is the value Clariant creates through collaboration and good business relationships with its stakeholders, including customers, policy-makers, and suppliers.**

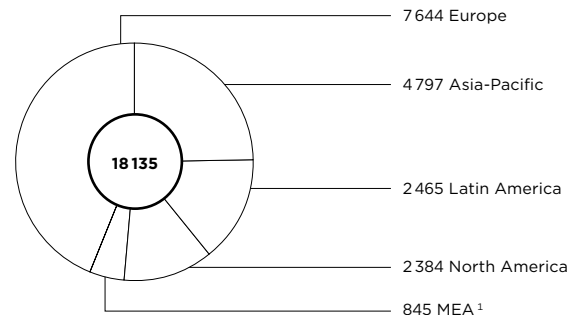
## 1. Human capital

Clariant expanded the number of full-time equivalents by 4 % to 18 135 in 2017. By fully integrating all people processes into one digital platform, Clariant is able to carry out a long-term planning for talents and key positions. The high priority it ascribes to the health, safety, and well-being of its employees is reflected in the low, stable Lost Time Accident Rate.

The regional distribution of FTE at Clariant remained almost unchanged compared to 2016, with slight increases in Asia-Pacific (+1.7 percentage points) and North America (+0.9 percentage points) and decreases of the same magnitude in Europe (-1.7 percentage points) and Latin America (-0.9 percentage points).

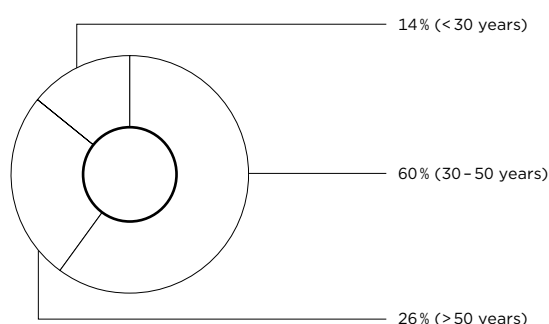
The age and gender structure of Clariant employees remained constant. In 2017, 14 % of employees were younger than 30 years, 60 % were 30 – 50 years old, and 26 % were older than 50 years. The total workforce consisted of 79 % men and 21 % women.

001 FTE BY REGION



<sup>1</sup> Middle East/Africa

<b>HUMAN CAPITAL</b>			
	<b>2017</b>	2016	Change in %
Total staff (in FTE)	<b>18 135</b>	17 442	4
Employees (in FTE)	<b>10 482</b>	9 881	6.1
Male	<b>7 264</b>	6 734 (68%)	7.9
Female	<b>3 218</b>	3 147 (32%)	2.3
Workers (in FTE)	<b>7 653</b>	7 560	1.2
Male	<b>7 066</b>	6 995 (93%)	1
Female	<b>587</b>	565 (7%)	3.9
Number of people hired	<b>1 983</b>	1 675	18.4
Male	<b>1 412</b>	1 094	29.1
Female	<b>571</b>	581	-1.7
Number of people who left the company	<b>1 991</b>	1 898	4.9
Male	<b>1 448</b>	1 269	14.1
Female	<b>543</b>	629	-13.7
Turnover rate (%)	<b>10.7</b>	10.7	-
Number of employees in the local, regional, and global talent pools	<b>&gt; 1 000</b>	> 1 000	0
Global management positions (ML 1 - 5) filled with internal candidates (%)	<b>85</b>	85	-
Total training hours	<b>192 000</b>	201 884	-4.9
Number of training participants	<b>9 720</b>	11 000	-11.6
Training hours (Ø per participant)	<b>20</b>	19	5.3
Number of employees with standardized performance management process	<b>10 000</b>	9 000	11.1
Staff in Research & Development	<b>-1 100</b>	-1 100	0
Lost Time Accident Rate (LTAR; accidents with at least 1 day lost/200 000 work hours)	<b>0.20</b>	0.19	5.3

**002 AGE DIVERSITY****1.1. Talent attraction and development**

Talent attraction and development is seen as one of the core elements for future success in Clariant's materiality assessment with stakeholders. It is also a key pillar in the strategies. At the same time, Clariant aligns all people processes from recruitment, on-boarding, performance management, development and deployment to ensure an integrated approach to talent management. All processes are linked on the digital platform »My Success« and provide transparency on key performance indicators achievements and will allow to predict future requirements to line management.

Clariant's objective is to attract those people who fit with its values and who meet the defined role requirements. In 2017, Clariant hired 1 983 new employees (571 women and 1 412 men) to support its profitable growth strategy. With 31% of new hires, Europe accounted for the largest share of new employees, followed by the Asia Pacific region, accounting for 25% of new hires. Dedicated candidate attraction teams were established to identify high-potential candidates in the market. The social media campaign **#RealPeopleofClariant** showcases Clariant's innovative approach to recruitment. As a result we significantly improved the »time-to-fill« vacancies.



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**#RealPeopleofClariant**  
[clariant.com/real-people](https://clariant.com/real-people)

# 10 000

The standardized performance management process includes 10 000 employees or 54 % of the total workforce.

A standardized on-boarding process ensures a quick integration into the organization. The on-boarding process is supported by the digital platform »My Success«. It supports the integration of newly hired or promoted employees into the new role by assigning role specific trainings and other measures during the first six to twelve months.

Clariant's performance management process ensures that strategic business objectives are translated into the employee's day-to-day actions. In 2017, more than **10 000 employees** followed a standardized performance management process. This reflects approximately 54 % of the entire workforce. To guarantee consistency in performance ratings, Human Resources leads calibration sessions for all management levels in 2017 to create a common understanding and language regarding performance expectations and rating. This calibration process covered approximately 900 employees in 2017 and will be further rolled out in the next years.

Development of skills is imperative to remain agile and drive innovation in fast evolving markets, which continuously demand new competencies. Competency development initiatives should support employees to meet current and future role requirements and should be aligned to business requirements. Therefore competency requirements are defined for key job families and key roles in the organization and employees are being evaluated against these requirements. Thus the company gets a concrete view on individual's and organizational strengths and gaps which need to be closed. After a structured evaluation of the commercial organization in 2015 and 2016, the innovation leadership was evaluated in 2017. Each evaluated individual will receive an individ-

ual development plan. In addition, new trainings were launched in 2017 to complement Clariant Academy programs: 230 production shift leaders engaged in the »Frontline Leadership Program« and 240 individual contributors acting in a matrix organization participated in the »Leading without Formal Authority Training«. The »Pioneer Program« was launched: 25 high potentials have participated in the program, have worked on defined strategic experiments and have enjoyed a mentorship program.

Overall, 9 720 employees participated in a training recorded in the central learning management system for a total of 192 000 training hours. The average training hours per employee that has participated in trainings has increased by 4 % to 20 hours per employee.

Talent Management integrates all activities from workforce planning, to attracting, developing and deploying talent. A robust Talent Management process is key for a sustainable organizational development and long term company's success. A strong performance in the current role is a prerequisite to be nominated for the Talent Management process. Assigned talent managers lead this process across the whole organization and support line management to identify local, regional and global talents in order to plan their careers and to accelerate their development. More than 1 400 talents were discussed in 45 talent reviews across the organization and concrete development steps and career measures were defined and will be implemented in 2018. A reward for Clariant's systematic Talent Management activities is a talent retention quote of 97 % in 2017, increasing the high level of former years. For 58 % of senior management positions Clariant has promoted talents, whereas overall 85 % were filled with internal population.

Integrated Talent Management requires a stable technical solution that enables reliable people analytics. In 2017, Clariant has enlarged its existing digital human resource management system to create a fully integrated tool. All people processes from recruitment to onboarding, learning, talent and performance management are now managed through the »MySuccess« platform. In the meantime, the data of 19 000 employees was migrated to the system and 1 300 employee self-service workflows were completed. »MySuccess« captured 32 000 applications, 8 200 performance forms were created, and 1 500 employees were using the personal development plan functionality. These numbers illustrate the great potential of an integrated human resource platform to increase efficiency and contribute to improving Clariant's talent attraction and development practices. For more information about the digital Human Resource journey see → **PAGE 26**.

## 1.2. Employee Engagement

In November 2016, Clariant conducted its second employee engagement survey in order to listen again to the voices of the employees and to assess what matters most to them. Almost 90 % of the global workforce (2016: 17 442 FTE) were invited to participate, and 69 % of those invited – representing nearly 11 000 employees – took part. In 2017, Clariant performed an in-depth analysis of the survey results. On a global level, the results show that Clariant has significantly increased its engagement score compared to the results of the first survey in 2014, reflecting that the various initiatives taken after the first survey are paying off. The Business Area Natural Resources performed exceptionally well, resulting in an engagement score increase of 12 percentage points compared to 2014. One factor that fostered

this positive trend, was the increased visibility of senior management as well as the continuous improvement in employee safety and protection. These developments show that active leadership remains key in sustainably engaging an organization's workforce.

Oliver Kinkel, Head of Region Europe, restructured his on-site visits in 2017 to address the concerns and needs of his employees. Therefore, he did not only meet local management teams and junior executives, but also organized various town hall meetings to inform employees about current issues, products and innovations. In addition to this, he invited employees to directly engage in open discussions and hence organized several meetings, for example between more than **50 young talents** and the Executive Committee. A similar approach was taken in China, where ten focus group discussions with 172 employees from five different Business Units were held and led, for example, to the proposal of more non-monetary recognition programs.

Both Clariant Argentina and Indonesia reached very high scores in the engagement survey, also being mirrored by the fact that the Human Capital and Management Consultancy Aon Hewitt recognized both subsidiaries as »Best Place to Work« within their respective country in 2017.

Satisfied and motivated employees commit to themselves, their teams and to the company. They strive to improve the status quo and aspire the extraordinary. Clariant emphasizes on approachable and authentic leadership, transparent communication and appreciating the voices of employees to build a high-performance culture.

# 50

**While the EC** engaged in open discussions with 50 young talents in Europe, ten focus group discussions with 172 participants were held in China.



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Safety, and Well-Being  
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### 1.3. Occupational health, safety, and well-being

Maintaining a safety-oriented leadership culture at all levels and across regions is a core priority for Clariant as demonstrated by its ambitious objective of zero accidents. A range of multifaceted health and safety programs, such as the AvoidingAccidents@Clariant program, underscore its commitment to the Occupational Health, Safety, and Well-being of its diverse and hard-working employees.

	2017	2016	Change in %
Lost time accidents <sup>1</sup>	<b>38</b>	37	2.7
Lost time accident rate (LTAR) <sup>2</sup>	<b>0.2</b>	0.19	5.3
Number of recognized occupational diseases	<b>0</b>	1	-100
Number of work related fatal accidents	<b>2</b>	0	-
Lost workdays (LWD) caused by occupational accidents	<b>1 135</b> <sup>3</sup>	1955	-41.9
Lost workday rate (LWDR) <sup>4</sup>	<b>5.95</b> <sup>3</sup>	9.8	-39.3

<sup>1</sup> Number of occupational accidents with at least one day's work lost

<sup>2</sup> Lost Time Accident Rate = ratio of the number of occupational accidents where at least one day's work was lost to every 200 000 hours of work

<sup>3</sup> Including 221 LWDs carried over from 2016

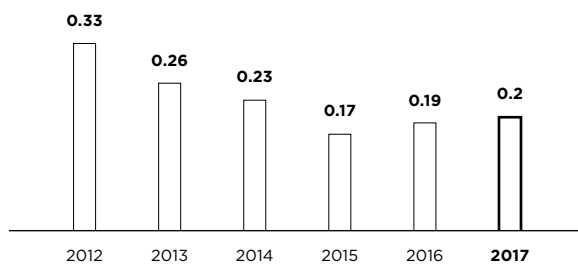
<sup>4</sup> Lost Workday Rate = loss of work days caused by occupational accidents in relation to 200 000 hours of work

In 2017, there were two fatal accidents in Clariant production sites: one at the production site Cileungsi in Indonesia, and the other at the production site Jianping in China. Clariant deeply regrets these incidents and will do its utmost to pursue its objective of zero accidents in 2018. Some other people were fatally injured in traffic accidents, which Clariant also deeply regrets.

The number of lost-time accidents slightly increased from 37 in 2016 to 38 in 2017, with two cases concerning supervised (non-Clariant) workers. In addition, eight lost time accidents involved contractors, which represents a decrease of three cases compared to 2016. 79 % of all occupational accidents required first aid measures, 13 % medical treatment, and 8 % of recorded injuries were restricted work cases. The most frequent injury types in 2017 were sprains, bruises, and contusions (31 %), bone fractures (24 %) and open wounds (10 %). Burn injuries, chemical burns and internal injuries each accounted for 8 %, poisonings for 5 %, and injuries due to electrical incidents for 3 %. In 3 % of the cases a limb was lost.

Clariant managed to stabilize the lost time accident rate (LTAR) at a low level of 0.2 accidents per 200 000 hours of work, as compared to 0.19 in 2016. While the rate slightly increased the second time in a row (from 0.17 in 2015), it represents the third lowest level since the beginning of the monitoring. One key factor that prevented the rate from rising further, was the Leadership Improvement Initiative.

002 **LOST TIME ACCIDENT RATE**  
(accidents with at least 1 day lost/200 000 working hours)



This includes measures like site tours conducted by members of the Business Units' management committees to ask safety related questions and deepen awareness, so called »safety moments« at the beginning of meetings, and the mandatory involvement of site managers and their next level managers in Incident Investigation Reviews.

The total number of lost workdays decreased significantly from 1 955 in 2016 to 1 135 in 2017, including 221 lost workdays carried over from 2016. This represents **an improvement of 42%** and indicates that the injuries became less severe. Clariant also managed to reduce the lost workday rate to 5.95 work days lost per 200 000 hours of work. Compared to 2016, this is a reduction of 39%. In 2017, Clariant's efforts regarding Occupational Health, Safety and Well-being also resulted in excellent performances at four sites in the South-East Asia & Pacific, North America, and Greater China regions, which were awarded the Clariant Outstanding Safety Achievement Award.

Another priority area in 2017 was safety in the Business Units' operations. Clariant's occupational health and safety experts worked closely with sites across all regions to develop new tools that support them in fulfilling health and safety requirements. For example, Clariant has adapted their reporting requirements on Process Safety Events to the International Council of Chemical Associations. The internal guidelines and reporting templates have been modified and changes communicated accordingly. Due to the change in our Process Safety Event reporting limits starting 2018, many trainings and webinars have been carried out which have impacted the reporting culture increasing the total number of reports from 40 in 2016 to 66 in 2017. We expect that this trend will continue in the following years. The Occupational Health and Safety Department has also been working with the Business Unit Masterbatches to improve an existing tool for high-quality workplace risk assessments. The roll-out in other Business Units has already started.

Since 2017, Clariant started to enhance the monitoring of occupational accidents by distinguishing between different injury categories as first aid, medical treatment and restricted work cases at Group level. This will make it possible to concentrate on severe injuries in incident investigation and will minimize production disruptions, contributing to Clariant's long-term profitability.

# 42

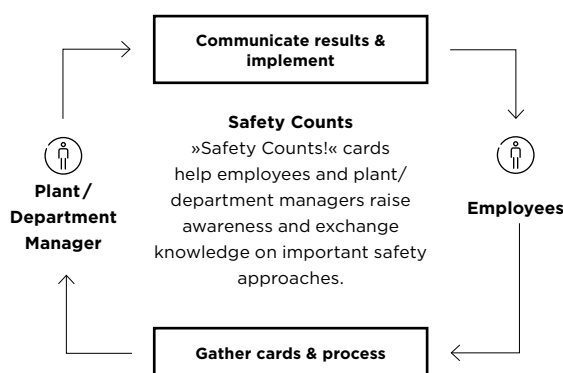
**The loss** of workdays caused by occupational accidents in relation to 200 000 hours of work decreased by 42%.



### AVOIDINGACCIDENTS@CLARIANT

Occupational Health, Safety, and Well-being at Clariant means much more than wearing necessary safety gear. It is a commitment to tackle safety in a comprehensive way and ensure that every employee returns home after work as healthy as they arrived at the workplace. The most effective way to prevent occupational accidents and achieve the goal of zero accidents is by implementing a set of cohesive management programs and leadership measures. AvoidingAccidents@Clariant is a global program that creates safe working environments, raises awareness of safety, and illustrates Clariant's focus on prevention. Since the start of the program in 2007, the lost time accident rate (LTAR) has declined from 0.92 to 0.2.

Clariant's »Safety Counts!« cards also play an important role in ensuring health and safety, helping employees record critical safety situations and the circumstances that led to them. Improvement measures taken are shared locally, enabling the production teams to build best practices and promote a preventive mindset throughout the entire company.



# 34

An additional margin of CHF 12.3 m was achieved through 34 Marketing Excellence projects.

## 2. Relationship capital

In 2017, Clariant focused closely on enhancing its relationship capital. Although it did not conduct a customer satisfaction survey, Clariant engaged directly with customers to learn about their unmet needs. It also maintained strong contacts with the chemical industry and policy-makers. Through its ongoing collaboration with suppliers, customers, and other leading chemical companies, Clariant continued to improve the whole industry's value chains with a strong focus on sustainability.

### RELATIONSHIP CAPITAL

	2017	2016	Change in %
Survey responses from customer contacts obtained	n.a. <sup>1</sup>	2 693	n.a.
Customer interviews	515	- 500	- 3
Raw material suppliers	7 000	5 250	33.3
Raw material supply base by spend covered by sustainability evaluations (%)	65	63	-

<sup>1</sup> Clariant runs biannual customer satisfaction surveys

### 2.1. Customer relationship

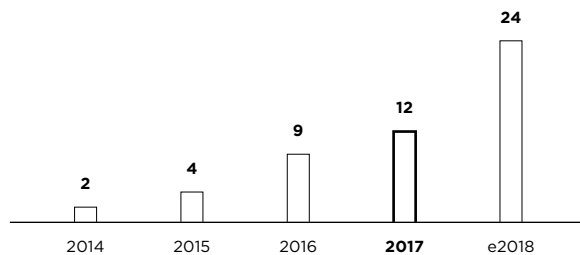
Customer engagement is key to profitable growth and is thus at the core of Clariant's commercial strategy. This clear focus reflects a cultural change in the company over the past years, turning from a product-driven into a customer-centric business. Clariant gained a significantly better understanding of the customers' perspectives with this transformation, enabling tailor-made value propositions that meet pressing needs. Since 2014, a total of 88 **Marketing Excellence projects** have been carried out, of which 34 in 2017 alone. The additional margin generated from Marketing Excellence projects

# 90

**Leading Marketing Organization** is expected to deliver an increase of CHF 90 m in profitability by 2020.

increased from CHF 9.3 million in 2016 to CHF 12.3 million in 2017, of which 50% was accounted for by the Asia and Pacific region. Clariant expects to double the commercial margin to CHF 24 million in 2018.

003 **COMMERCIAL MARGIN** in CHF m



Customer focus is also reflected in the increasing number of customer interactions. For example, in 2017, Clariant conducted 515 customer interviews and 59 interviews with industry experts in the Marketing Excellence projects only. On top of that, Clariant also concluded 46 customer interviews in the context of an outside-in assessment of its sales organizations in the Business Units and regions and organized twelve customer workshops for dedicated Innovation Excellence projects. Additional interviews were conducted for specific projects. For example, Business Unit Masterbatches interviewed 150 customers, aiming to improve its customer retention.

To further strengthen commercial capabilities, Clariant comprehensively restructured its marketing organization in 2017, see »Marketing Advances« → **PAGE 56**. As part of the Leading Marketing Organization initiative, new marketing structures and functions were defined

for each Business Unit, tailored to their individual business needs. By the end of 2017, all Business Units had developed detailed organizational blueprints with a clear allocation of marketing activities and defined key roles and responsibilities. In total, Clariant will add 94 FTEs to its Commercial Organization by 2020, with 59 positions to be filled in 2018.

At the end of 2017, the recruiting process for key positions in the new marketing organizations was initiated. As part of the Leading Marketing Organization initiative, clear career paths for marketing professionals have been determined. In 2018, Clariant plans to launch a dedicated marketing training curriculum. Overall, Clariant expects **an increase of CHF 90 million in profitability** by 2020 from its Leading Marketing Organization initiative. In order to achieve this objective, commercial targets were included in the 2018 goal-setting process and Annual Performance Cycle.

## 2.2. Ethics and compliance

Clariant aspires to be perceived by its stakeholders as a world-class, high-performance company and a reliable partner that acts with the utmost integrity. Clariant believes that sustainable business success is closely linked to compliance with laws, regulations, and ethical standards and therefore implemented several measures in 2017 to emphasize the importance of Ethics and Compliance issues throughout the company.

First, Clariant launched an ethical journal that discusses real cases from its businesses and how they were resolved. Through the campaign »Excellence through Integrity,« the members of the Executive Committee



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and the Regional Heads stated what integrity means to them and further raised awareness for ethical behavior. Clariant also continued its mandatory compliance trainings to avoid violations of the Code of Conduct, both via e-learning and in-person courses. Certain target groups received specific trainings on competition and anti-trust law. Of the 80 questions and allegations regarding ethics and compliance issues that were reported in 2017 through Clariant's anonymous Integrity Line, 16 were fully or partially substantiated and 46 cases were closed by the end of the year.

In 2018, Clariant will roll out the strategic integrity roadmap. Furthermore, it will offer basic e-learning courses on bribery and corruption, data privacy, and risk-based anti-trust law. Lastly, Clariant plans to launch leader-led compliance sessions, in which senior managers discuss ethical dilemmas with their teams.

### 2.3. Policy and stakeholder relations

Maintaining an open and trustworthy dialog with all stakeholders and participating in relevant public policy development processes are important aspects of Clariant's corporate responsibility. Besides its engagement in business and trade associations, such as the International Council of Chemical Associations (ICCA), the European Chemical Industry Council (Cefic), and China's Petroleum and Chemical Industry Federation, Clariant contributes to public policy making in several areas such as chemical management and substitution, bio-economy, circular economy, competitiveness, innovation, and trade. In 2017, Clariant implemented advocacy campaigns on regulatory dossiers of strategic interest including, for example, the revision of the

Renewable Energy Directive of the European Union. In this context, Clariant specifically advocated for an ambitious blending target for second-generation bio-fuels. Clariant also promoted the chemical industry's Responsible Care™ program in several countries.

### 2.4. Sustainability performance in the supply chain

Clariant sources over 36 500 types of raw materials from around 7 000 suppliers. Spending on raw materials accounted for CHF 2.7 billion in 2017, which represents the largest portion of Clariant's total expenditure. Given the importance of suppliers in Clariant's value creation, they also have a substantial impact on the company's overall sustainability performance. Clariant believes that true leadership in sustainability extends beyond the company's own operations – that businesses should manage their environmental, social, and governance impacts and leverage sustainability opportunities across the entire value chain. Customers, employees, consumers, and the public expect companies to understand their wider impacts and drive sustainable change and growth.

Fully committed to this vision, Clariant selects and manages its suppliers, outsourcing partners, and service providers based on a comprehensive set of criteria. They include not only the economic and product-specific performance, but also non-financial and sustainability considerations, such as environmental and safety standards, social and governance aspects, complaint management, working conditions, and respect for human rights.



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Adding value with sustainability is one of Clariant's five strategic pillars. Therefore, Clariant expects its suppliers to uphold ethical and sustainable business practices and embeds sustainability in the selection and management of suppliers. Since the launch of the Sustainability Supplier program in 2012, it has been rolled out across the procurement organizations of all regions and spend areas, underscoring the strategic relevance that sustainability has for the entire business.

The Supplier Code of Conduct outlines Clariant's strategy, scope, and expectations regarding the sustainability engagement and performance of its suppliers. Suppliers and their subsidiaries are required to agree to and fully comply with the Supplier Code of Conduct. It was rolled out in 2014 across the entire supply base of more than 22 000 suppliers through written communication and via face-to-face meetings with top suppliers in each region. The Supplier Code of Conduct is also included in Clariant's General Terms and Conditions of Purchase incorporated in every purchase order issued by the procurement organizations.

To monitor and improve adherence with the principles laid out in its Supplier Code of Conduct, Clariant relies on the assessments and audits conducted by »Together for Sustainability« (TfS), a joint initiative of major chemical companies to assess and steer sustainability in the supply chain. Clariant joined TfS in 2014 to accelerate the deployment of these assessments and audits. Founded in 2012 by six companies, TfS today lists 20 members representing a combined yearly spend of more than CHF 200 billion. As an active TfS member, Clariant contributes sustainability performance assess-

ments and audits of its suppliers. In turn, it gains access to the assessments generated and shared by the other TfS members.

TfS supplier assessments and audits are conducted according to a standard approach by best-in-class service providers to guarantee both independence and consistency of results. Sustainability assessments are run by EcoVadis. Applying a state-of-the-art methodology, EcoVadis generates sustainability scorecards, which provide an overall score as well as a sub-score for the performance on Environment, Labor Practices, Fair Business Practices, and Sustainable Procurement. In 2017, TfS members assessed 2 309 of their suppliers, compared to 1 773 conducted in 2016. Since its inception in 2012, TfS members have assessed a total of 8 692 suppliers. Clariant regularly maps all sustainability assessments generated by TfS members against its supply base to identify which portion of its total spend is covered by the evaluations. The last mapping in 2017 revealed that 65 % of Clariant's spending on raw materials was covered by TfS assessments. This is considered a big success, given that TfS was only launched in 2012. By 2019, Clariant aims to reach a direct spend coverage of over 70 %.

In order to carry out the on-site sustainability audits, TfS selected Intertek, SGS, DSQ Group, and ERM – all globally renowned and specialized service providers.

The number of new audits increased from 403 in 2016 to 441 in 2017, for a total of 1187 audits conducted since 2012. By 2019, Tfs aims to achieve 1400 audits.

<b>SUSTAINABLE VALUE CHAIN</b>			
	<b>2017</b>	2016	Change in %
Number of new Sustainability Assessments shared <sup>1</sup>	<b>2 309</b>	1 773	30.2
Percentage of direct spend (raw materials) covered by total number of shared Sustainability Assessments (%)	<b>65</b>	63	-
Number of new Sustainability Audits shared <sup>2</sup>	<b>441</b>	403	9.4

<sup>1</sup> Together for Sustainability supplier assessments

<sup>2</sup> Together for Sustainability supplier audits, based on EcoVadis sustainability criteria

In 2017, based on the EcoVadis scorecards, Clariant segmented its supply base and began a program of Corrective Action Plans (CAPs) to reduce the identified sustainability risks. It launched almost 200 supplier CAPs, of which more than half were completed by the end of 2017. In 2018, the suppliers for which a CAP has been launched will undergo a reassessment in order to evaluate whether the required progress was made. Fellow Tfs members contribute to Clariant's risk reduction even further by also running CAPs with some of Clariant's suppliers. Corrective Action Plans are also prescribed based on Tfs audit reports.

Third-party supplier assessments and audits are complemented by active supplier communication and support, including, for example, sharing a regularly updated information package (Supplier Toolkit) and hosting sustainability events in key sourcing markets. To increase awareness and enhance the capability to evaluate sustainability performance in the supply chain, Clariant organizes yearly internal trainings. In 2017, all procurement associates participated in Capability Building Program webinars.

Clariant's supply chain sustainability performance received external recognition over the last three years. It received the prestigious EIPM (European Institute for Purchasing Management) Award for Sustainability Leadership in Supply Chain. It also received the highest EcoVadis assessment score (78 points) across the entire chemical industry. The score of 70 points received for its sustainable procurement practices put Clariant in the 99th percentile of the ranking.



#### ENHANCED TRANSPARENCY AND CERTIFICATION OF THE SUPPLY CHAIN

With renewable raw materials such as palm oil, the key lever to achieve a more sustainable value chain is transparency. Therefore, Clariant pursued certification of its palm-oil derivatives supply by joining the Roundtable on Sustainable Palm Oil (RSPO) and achieving mass balance certification of all relevant sites in 2016. In 2017, Clariant worked intensively to further broaden its RSPO mass balance-certified product portfolio for the Personal and Home Care markets in Europe, Asia, North America, and Latin America. Overall, Clariant now offers more than 180 products in RSPO mass balance quality. Efforts to further extend the portfolio will continue in 2018 to help Clariant's customers comply with increasing demand for certified-palm ingredients in the end-consumer markets.

#### 2.5. Human rights

Clariant respects and supports human rights, both in its own operations and supply chains, and recognizes the protection of human rights as a key element of sound business governance and a prerequisite for any company's license to operate. Clariant likewise expects suppliers and business partners to maintain the same high standards regarding human rights in order to promote socially sustainable growth.

In 2016, Clariant conducted a human rights due diligence assessment with the support of external human rights experts to evaluate the potential human rights impacts in its operations and the effectiveness of the management and monitoring systems in place. The assessment concluded that Clariant's potential human

rights impacts primarily relate to contract labor and the supply chains for natural raw materials, particularly in geographies with weak national legal frameworks. Building on this assessment, in 2017, Clariant carried out a review of the legal requirements, conditions, and control measures related to contract labor in India. The review found that the country organization is well-aware of the legal requirements and had already implemented a clear and comprehensive process, which was supported by detailed evidence, checklists, and regular exchanges with authorities. In the future, Clariant will continue mapping the origin of raw materials to gain a better understanding of its potential human rights impacts along the supply chain.

In 2017, the Clariant Global Employment Standards Policy was fundamentally revised. The updated policy sets binding key principles and applies to all companies of the Clariant Group, which are fully financially consolidated by Clariant International AG (Switzerland), as well as to employee agencies and contractors that collaborate with Clariant or engage on behalf of Clariant.



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**Weekly drills**

To be prepared for any emergency the Tangerang site's fire brigade performs weekly drills.



# Empowering Change

## How a production site in Indonesia reinvented itself and successfully changed its safety culture along the way.

Even after almost 22 years, Ka Fung remembers all too well the day that changed his mind about personal safety. He had just started working at Clariant's production site in Tangerang, about 25 kilometers west of Jakarta, Indonesia's capital. He was hired as a maintenance engineer straight out of college. »It was my first job after leaving school and I was probably a bit too eager and carefree«, he admits. While working on the shop floor one day he stood up abruptly and banged his head on a metal rod. »I wasn't wearing my helmet, and the hit nearly knocked me off my feet«, Ka Fung remembers. »I didn't need stitches or anything, but it did bleed and certainly left a mark.« What Ka Fung realized then and there was how even small lapses might hurt you when you least expect it. »There wasn't really anything that could have fallen on our heads at the time, so I felt no need to wear a helmet. But safety is never just about your own risk assessment in the moment or the dangers you can easily foresee«, he says.

Clariant's site in Tangerang is special in several ways. It's the company's largest site in Indonesia and its headquarter in the country. In all, Clariant's Business Units run six production sites and a couple of offices across three of the major islands, Java, Sumatra, and Kalimantan. Of the 700-plus people Clariant employs in Indonesia, more than a third work in Tangerang. Today, it is run as a multi-user site. That means it's home to several Business Units of Clariant as well as other companies.



**The last** so-called Lost Time Accident (LTA) of a Clariant employee or a contractor at the Tangerang site happened seven years ago. A LTA is an accident on the job that results in an employee being absent from the workplace for at least one full workday.

# 4

Since 2016 on average 4 safety workshops have been held each month at the Tangerang site.



## REWARDING EFFORTS

In 2017 Clariant Indonesia also received the Responsible Care™ Platinum Award honoring outstanding performance in terms of sustainable business practices. According to the auditors Clariant scored 98 out of 100 possible points, the highest rating among the more than 50 participating companies, most of which were multinationals. The Responsible Care™ Award is part of a 1985 charter by the global chemical industry promoting sustainable business practices. It is the first such platinum award given out in Indonesia in five years. Earlier in 2017 Clariant Indonesia received special recognition by Responsible Care™ Indonesia for outstanding performance in chemical transportation and distribution safety.

The site and its main operation, however, are run by Clariant's Industrial & Consumer Specialties Business Unit (ICS) which produces specialty chemicals and application solutions for consumer care and industrial markets. The active ingredients in conditioners are one example. Growing consumer markets in the emerging economies of Southeast Asia are driving demand. Indonesia is one such market. As the world's most populous Muslim country, it drives trends in other ways too. It's no coincidence that Tangerang specializes in products that rely on palm and coconut fat rather than tallow. The site recently received its halal certification under Islamic law, opening up a growing market of home and personal care products catering to devout Muslims.

»Today's setup of the Tangerang site is the result of major changes that began around 2012«, says Hans Herrel, the site manager and Head of Clariant's operations in Indonesia. Before, Tangerang had been a production site mostly for textile chemicals and dyes. When Clariant sold parts of that business, some of the assets at Tangerang changed hands as well. »There was a lot of work to do«, Herrel remembers. »We had to physically

untangle operations and the flows of materials. At the same time, Clariant wanted to establish Tangerang as a production site for ICS's growing business in the region. So we had to redesign and partially rebuild the site.«

Literally moving facilities across the site, building new ones, de-coupling from sold-off assets and re-routing the flows of materials, utilities, products, energy, and waste – all this turned the construction efforts into a Herculean task. But Herrel, who has been with Clariant since the 1980s, took the shift as a challenge as well as an opportunity to improve. By 2015 Tangerang had seen not only the arrival of a new business but also the implementation of a state-of-the-art energy management system and new safety standards. »ICS actually brought a different class of chemicals to our site«, says Herrel. »Those came with higher levels of safety requirements, both in terms of equipment and organization.«

The construction work itself posed challenges of its own. »Having hundreds of third-party construction workers on site at a time is never ideal. That's when we realized we had to improve our safety management«, Herrel says contritely. »We had no accidents during all this construction work but, in hindsight, we really missed the mark at times.« He chalks it up to a lack in safety culture both at the workplace and beyond. »If you've ever driven on the streets of Jakarta or elsewhere in Indonesia, you'll notice that safety and traffic rules are neither followed nor enforced very strictly. That's not to say that Indonesians are reckless. There's just a very different attitude both towards risk and authority. You can't just put rules in place and hope they're followed. You have to actively change attitudes.«

Changing minds requires a lot of effort and understanding. Herrel knows a thing or two about that. He has spent most of his life working to improve and manage operations in Southeast Asia, be it in the Philippines, Singapore or Indonesia. In 1986 he was hired and trained explicitly to do just that. »Back then the company was desperately looking for engineers to improve operational standards at its sites outside of Europe«, Herrel says. As a student in Kaiserslautern he had spent his semester breaks working as a ski instructor and tour guide for American tourists. »So my English was pretty good, at least for a German engineer in the 1980s.« However, working with local teams and then trying to fundamentally change the way things are done is something he had to learn on the job.

When it came to improving the processes and organization at the Tangerang site, Herrel was in his element. »Authority and strict rules only go so far«, he says. »You

»Safety is more than just putting rules in place. You have to actively change attitudes.«

**Hans Herrel**  
Country Head Indonesia



**A new standard**

Clariant's production site in Tangerang, Indonesia has been recognized for its outstanding performance in terms of sustainable business practices and safety.



# 2439

**In 2014** a global reporting system was put in place. Since then 2439 near misses or potential accidents have been reported.

have to win people over. You have to show appreciation. And you have to give people ownership in a way.« A lot of the changes he and his local team implemented in Tangerang dealt less with technology than with attitudes. Or as he puts it: »The hardware was mostly in place. We had to update the software.« Safety concerns literally became item number one on the agenda of every team meeting. Herrel initiated what has come to be known as the »Clariant Tangerang Coffee Club«, a kind of regular powwow involving the entire staff of the site. Early, around seven thirty, more than 200 people gather in the lobby of the main building. »It's a chance to mingle and to get updates on current developments«, Herrel says. »And we always start off with what's going on safety-wise.«

There has been no lack of topics for these meetings. Tangerang has seen hundreds of projects in environmental and work safety as well as audits by government officials, customers and Clariant itself. The company's own excellence initiative kickstarted more than 250 projects to improve both efficiency and safety at the site. Safety workshops in 2016 and 2017 alone saw more than 1200 participants. Herrel hired a retired military drill sergeant as the head of site safety and security. The site's fire brigade was upgraded both in equipment and in training, and now performs weekly drills. Organizational changes brought further improvements. »We've fundamentally changed the way we oversee contractors working on our site«, says Ka Fung, who's been involved in many of these changes. »What was once a centralized job is now being done at a more local level by the shop floor teams themselves. That means giving back ownership and responsibility to the teams and their supervisors for what goes on around them«, Ka Fung explains. »Once people feel accountable and in charge, they look out for each other more.«

Reporting and reviewing so-called near misses is another essential part of this new awareness. In 2014 Tangerang put in place a system that lets employees document whenever they've witnessed a potential accident, an undetected hazard or risky behavior. So far almost 2500 such cases have been reported. »This has nothing to do with denunciation, but everything with learning from mistakes – both by individuals and the organization as a whole«, says Herrel. »Everybody makes mistakes. To learn from them is what counts. It helps us identify hazards we hadn't foreseen, and it shows that we truly care about safety, not just about rules.« The message stuck early on, as Ka Fung remembers. From his early days as a maintenance engineer he has since moved on to become first a project engineer involved in the remodeling efforts on the site and eventually a so-called Lean Six Sigma Master Black Belt, which today sees him working to improve operational standards, processes and efficiency in Tangerang and beyond. It was his job, for example, to implement a state-of-the-art energy management system according to the ISO 50001 standards. At the time, Tangerang was one of the first three Clariant sites ever to do so – the only one outside Europe. »Before I got involved with improving standards and practices, I knew Hans only from my work as a spokesperson for the local union«, Ka Fung remembers. »Our exchanges on issues like pay or overtime were, let's say, lively. But I soon also witnessed how engaged he was and how well he understood folks on the shop floor. I think that's what made a big difference in the end.«

The changes at Tangerang are evident, and they've drawn attention. In 2017 Tangerang was awarded the Phoenix Award, recognizing the site as the biggest improver in terms of safety across all of Clariant. As the name Phoenix suggests, the award honors improvement



**»Once people feel accountable and in charge, they look out for each other.«**

**Ka Fung**  
Master Black Belt

rather than absolute performance. In its valuation, the jury mentions specific changes as well as previous shortcomings. »We've come a long way«, says Herrel. His staff seems to agree. In 2017, Clariant was recognized as the region's best employer in an independent survey by Aon, a consultancy. »But we're also well aware that our work towards better safety and accident prevention is never done«, says Herrel. A sad reminder of this came in 2017, only a few months after the award for Tangerang, with a fatal accident at another site in Indonesia. An employee died after a stack of bulk containers collapsed

on top of him. »The police have investigated the incident and found no wrongdoing. But it sadly shows that there's never a time to relax in our efforts«, Herrel says.

There's always a lot to learn and to improve. Tangerang may very well turn out as a model for other sites. As both Herrel and Ka Fung know, improving safety is about staying vigilant. It's about dealing with risks both obvious and unforeseen. And it almost always starts with changing minds and getting new ideas into people's heads. Preferably without bumping them.

# Planet

**Planet – Clariant’s third brand value – represents the value creation processes that benefit the environment. As natural capital is the basis on which business activity is built, Clariant uses natural resources responsibly, has programs in place to mitigate climate change and reduce waste, and increasingly considers circular economy aspects.**

## 1. Natural capital

Due to its strong commitment to environmental protection and careful use of natural resources, Clariant is well on its way to achieving its environmental targets 2025.

By focusing on business opportunities arising from environmental challenges, reducing energy use and water consumption, and minimizing pollution, greenhouse gas emissions, and waste generation, Clariant continuously improves its environmental impact.

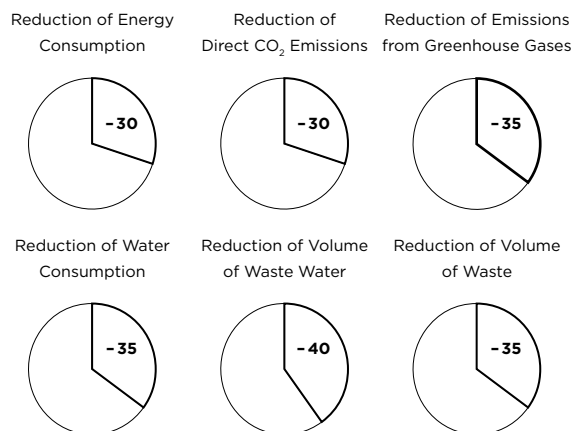
### NATURAL CAPITAL

	2017	2016	Change in %
Total energy consumption (in m kWh)	<b>3 245</b>	2 950	10.0
Energy consumption (in kWh/t production)	<b>706</b>	719	-1.8
Total water consumption (in m m <sup>3</sup> )	<b>49</b>	48	2.1
Total waste water generation (in m m <sup>3</sup> )	<b>13</b>	13	0
Total greenhouse gas emissions (scope 1 & 2 CO <sub>2</sub> equivalents) (in m t)	<b>0.97</b>	0.89	9.0
Greenhouse gas emissions (scope 1 & 2 CO <sub>2</sub> equivalents) (in kg/t production)	<b>211</b>	218	-3.2
Total quantity of waste (in thousand t)	<b>198</b>	147	34.7

## 1.1. Progress toward environmental targets 2025

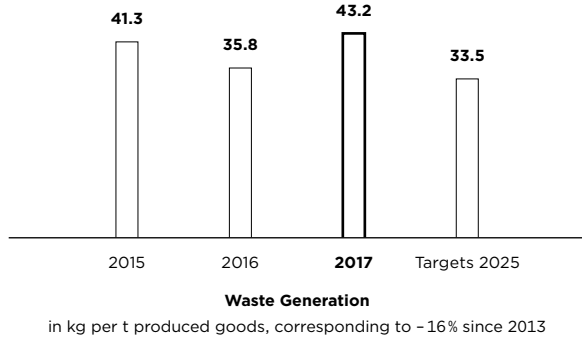
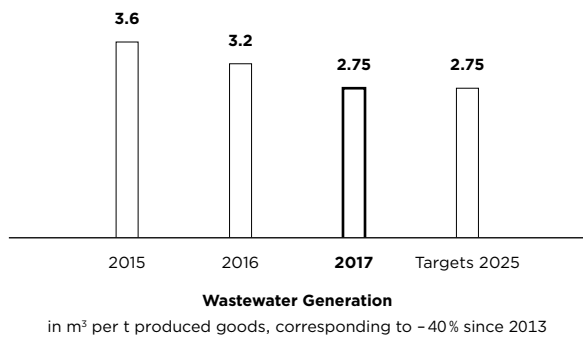
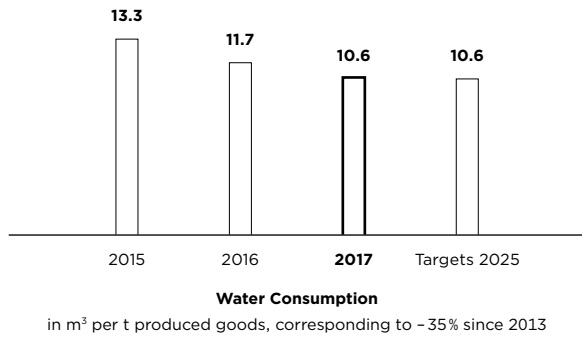
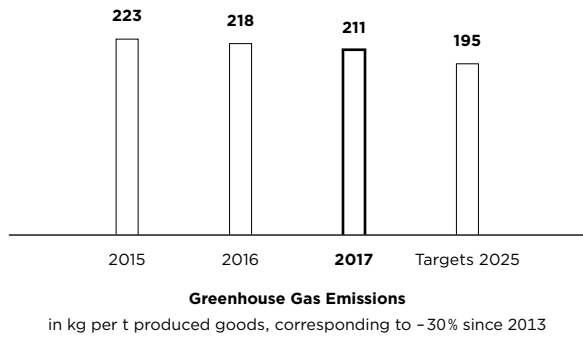
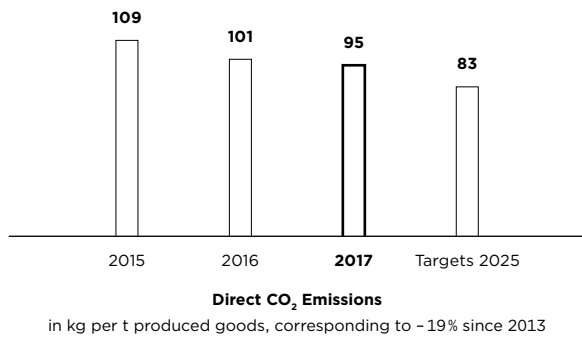
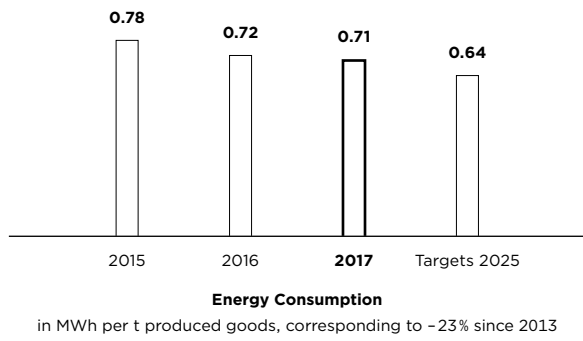
By 2025, Clariant wants to achieve significant improvements in six major parameters compared to the base year 2013. With respect to produced goods (per ton), Clariant aims to reduce energy consumption and direct CO<sub>2</sub> emissions by 30 %, greenhouse gas emissions, water consumption, and waste volume by 35 %, and the waste water volume by 40 %.

### 001 ENVIRONMENTAL TARGETS 2025 in % (per t produced goods)



The increase in total energy consumption, greenhouse gas emissions, and direct CO<sub>2</sub> emissions is mainly caused by the larger production volume of 4.60 m t in 2017 compared to 4.09 m t in 2016. While production volume increased by 12.5 %, total energy consumption rose by 10.0 %, total greenhouse gas emissions by 9.0 %, and total direct CO<sub>2</sub> emissions by 5.6 % only. Besides product portfolio alterations, Clariant’s comprehensive energy efficiency and greenhouse gas reduction efforts contribute to these diverging developments. In 2017, 339 projects were implemented as part of the eWATCH pro-

002 PROGRESS TOWARDS 2025 TARGETS







## eWATCH

eWATCH oversees all forms and usages of energy at Clariant – electricity, heating and cooling, steam, natural gas, nitrogen, and the production of deionized water – by taking into account the design and setup of equipment and processes across Clariant's facilities. It also records and analyzes Clariant's energy consumption, including information on energy flows, prices, and usage optimization. It maintains information on total energy usage patterns and requirements and will increasingly consider maintenance activities, changeovers, cleaning, and production planning and scheduling in the future.

gram. The energy savings project at the production site Cileungsi in Indonesia, for example, leads to a reduced energy consumption of 15 998 MWh per year, and by replacing coal with natural gas as primary energy used 608 t greenhouse gas emissions are eliminated annually. Overall, in relation to produced goods (per ton), in 2017 energy consumption decreased by 1.8 %, greenhouse gas emissions by 3.2 %, and direct CO<sub>2</sub> emissions by 5.9 %.

Total water consumption rose slightly by 2.1 % to 49 m m<sup>3</sup> in 2017. With regard to produced goods (per ton), water consumption decreased by 9.1 %. With this, Clariant almost achieved its 2025 target already in 2017. Due to the fact that water consumption in relation to produced goods is dependent on changes in production, Clariant seeks to maintain this level in the upcoming years. Total wastewater generation could be stabilized at 13 million m<sup>3</sup> in 2017 mainly because growth of production volume largely arose from additional bentonite processing, which generates comparably little wastewater.

Due to one-off effects, such as first-time accounting and new regulatory requirements for accounting, the reported total amount of waste rose by 34.7 % to 198 thousand t. More than half of this spike was due to gypsum, a byproduct of naturalization processes for bentonite-based products such as bleaching earths. The gypsum is currently being stored at the corresponding production sites until opportunities are found to commercialize it as a reusable material in the building industry.

In 2015, Corporate Environmental Safety and Health Affairs (ESHA) established the Target 2025 group so that stakeholders from different Business and Service Units can track progress and exchange knowledge on projects to further improve Clariant's environmental performance. Furthermore, ideation workshops with Business Units Functional Minerals and Industrial & Consumer Specialties were conducted. The objective of the workshops was to facilitate knowledge exchange between peers and generate ideas on how to achieve the 2025 targets. During the workshops, which were mainly attended by operations managers from various production sites, several actionable ideas were identified that will be implemented in the future.

### 1.2. Environmental protection and resources

Environmental protection and resources covers a broad range of environmental issues including energy, waste, water, pollution, and ecosystem effects. Reducing environmental impacts requires high-level and focused management, a culture of performance, and careful cost evaluation. For this reason, Clariant uses comprehensive management tools and programs that integrate technology, data, and behavioral guidelines.

#### 1.2.1. Reduction of energy and greenhouse gas emissions

Clariant continuously improves its energy management and aims to further reduce greenhouse gas emissions. Global programs such as eWATCH, Clariant Operational Excellence, and the Clariant Production System



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Management Approach  
Environmental Protection  
and Resources  
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2017/gri](https://reports.clariant.com/2017/gri)

# 50 000

**50 000 requests per year** are sent to Clariant from customers seeking documents, certifications or regulatory advice regarding applications of products.

Yield, Energy, Environment (YEE) initiative all contribute to achieving the 2025 targets. With eWATCH, Clariant developed a comprehensive energy efficiency program that identifies savings potential through the detailed analysis of energy consumption across Clariant's entire operations. Since 2013, a total of CHF 23 million has been saved due to energy efficiency measures and energy purchasing optimizations. In 2017, Clariant managed to **save CHF 3.5 million**.

Clariant's Operational Excellence Yield, Energy, Environment program (YEE) expands efficiency initiatives even further. The program increases yields, improves energy efficiency, and reduces waste streams by analyzing specific production processes or production units to create a comprehensive picture of energy optimization. Since approximately 80 % of expenditures in Clariant Business Units are allocated to raw materials, energy, and environmental technology, there is a huge savings potential. Since the inception of YEE in 2012, the program has resulted in savings of more than CHF 40 million. In 2017 alone, YEE enabled cost savings of CHF 8.1 million.

### 1.2.2. Reducing water consumption and waste water generation

Water is one of the most precious resources of our planet and also one of the main auxiliary materials for the chemical industry. On average, Clariant uses 70 % of the water purchased for the cooling of its production plants, 20 % for production processes, and 10 % as a product component or for sanitary purposes. Since

2013, water consumption at Clariant's production facilities decreased from 71 m<sup>3</sup> to 49 m<sup>3</sup>. At each production site, wastewater is first subjected to multistage chemical/physical pre-cleaning before being routed to largely biological wastewater treatment plants, where it is micro-biologically cleaned. Clariant has achieved a very high level in terms of wastewater treatment and water purification and thus discharged wastewater does not negatively impact ecosystems. With regard to produced goods (per ton), wastewater generation declined by 14.1 % to 2.75 m<sup>3</sup> compared to 2016.

In the reporting year, Clariant strengthened its water risk management by establishing an annual water risk assessment for sites operating under high water stress. This new approach follows a two-step process: First, Clariant systematically maps the water risks with a comprehensive tool, the Aqueduct Water Risk Map developed by World Resources Institute. A facility's overall water risk score (a combination of the quantity, quality, regulatory, and reputational risks) is calculated and the facilities that rank as medium to high risk are short-listed.

Based on this initial assessment, Clariant then refines the Aqueduct analysis by performing a more detailed internal risk assessment. Relevant sites report on impacts and emerging risks according to certain classifications and categories, allowing Clariant to identify the sites with water risks that could have a substantial impact on operations, revenue, or expenditure.

## 3.5

**With eWATCH** CHF 3.5 m energy costs could be saved in 2017.

Ultimately, at-risk sites are only a fraction of those located in high water stress areas, since many of these sites have minimal water consumption and therefore low risk exposure.

### 1.2.3. Pollution

Clariant implemented several measures to improve its performance regarding pollution prevention. For example, Clariant installed de-sulfurization control devices and dust collectors to reduce the emission of sulfur oxides. Air emissions and waste water quality of all sites is monitored closely. The parameters tracked for air emissions include volatile organic compounds (VOC), sulfur oxides (SO<sub>x</sub>), and nitrogen oxides (NO<sub>x</sub>). For assessing the waste water quality, heavy metals, nitrogen compounds, phosphorus, as well as biological and chemical oxygen demands are measured.

### 1.2.4. Ecosystem protection

Ecosystems provide a variety of goods and services upon which business and society depend, including water purification, energy production, and flood protection. Therefore, companies must mitigate their impact on the environment in order to ensure the longevity of these goods and services. For example, given its reliance on palm oil-based materials for many of its products, Clariant's efforts to protect rainforests and peatland through its sustainable palm oil programs are essential → **PAGE 149**. These programs help address the negative ecological consequences of clearing land for palm oil plantations and ensure ongoing production.

Reducing the impact of bentonite mining also illustrates Clariant's commitment to protecting ecosystems. Once test drilling verifies the presence of bentonite in the ground, Clariant's geologists must secure necessary permissions to drill and develop a plan to guarantee low environmental impact. When the quarry is opened, Clariant removes the top soil and overburden as carefully and efficiently as possible, in order to preserve it for future land restoration and reduce operating costs and fuel consumption. Clariant's quarries are usually rather small, which also reduces their environmental impact. In addition, the company ensures that animals can easily move to adjacent areas if they need to vacate the quarry site. Since transporting the clay out of the mine can result in increased impact, Clariant mitigates this by sun-drying the bentonite before transport, reducing the weight of the material being moved. Once a mine completes operation, Clariant restores the site in collaboration with experts in the field. This is not only necessary to comply with legal regulations, it allows the land to be reused for forestry or agriculture – a key step to staying on good terms with the surrounding community.

### 1.3. Climate change

Climate change is one of the world's biggest sustainability challenges. Given their significant climate impacts, businesses have the responsibility to address global warming, demonstrate climate resilience, and develop climate-friendly solutions. Under its 2025 targets, Clariant aims to reduce its direct CO<sub>2</sub> emissions by 30 % and its direct and indirect greenhouse gas emissions by 35 %. Clariant's climate change strategy further considers physical, regulatory, and reputational risks, and explores ways to reduce costs by improving operational efficiency and lowering spending on energy and materials.



In 2017, Clariant started reviewing its activities to strengthen its climate change strategy and steer further climate mitigation actions. It considered the latest international developments and best practices and focused on four fields of activity. First, Clariant reviewed its risk management processes and investment tools to steer activities more comprehensively and account for overall group climate risks, financial implications, and exposure. Second, it is currently evaluating the carbon efficiency of its energy supply and consider revising the energy procurement approach to increase the use of renewable energy. Third, Clariant is looking into how to improve the robustness and comprehensiveness of its data on emissions in the supply chain (Scope 3 emissions) to make the company's carbon footprint more transparent. Lastly, it examined further opportunities for the development of low-carbon solutions and supported its customers by providing goods and services that avoid greenhouse gas emissions. Several of these activities will be completed in 2018, enhancing Clariant's management of climate-related risks and opportunities.

#### 1.4. Circular economy

In a circular economy, waste generation is minimized and the value of products, materials, and resources is kept in the economy for as long as possible. This requires a strong focus on closing the loops by reusing, recovering, and recycling finite resources, increasing the use of renewable resources, focusing product design on recyclability, reparability, and durability, and building cooperation across all value chains. The chemical industry has a strong role to play in this transition and Clariant is ready to seize new market opportunities.

Clariant contributes to a circular economy in several ways, ranging from increasing eco-efficiency of production processes by using waste and renewable resources instead of virgin or fossil resources, to redesigning processes, promoting closed-loop recycling on-site, and engaging in industrial symbiosis and value chain clusters. Circular economy principles are also integrated into product and technology developments. For example, Clariant's sunliquid® technology uses agricultural residues to produce bioethanol. → PAGE 137

In order to support plastic recycling, Clariant is looking at various initiatives in the industry and has set up a dedicated focus field that is managed by its New Business Development under Group Technology & Innovation. Clariant already offers a wide range of innovative detergents, stabilizers, pigments and masterbatches that support recyclers and compounders obtain higher-value plastics from recycling streams. In 2017, Clariant addressed customer issues dealing with the odor and color of recycled plastics so that these materials could be used for applications that are vulnerable to these types of complaints.

With its Licocene® product range of hotmelt adhesives, Clariant offers solutions that support recyclability. For example, by reducing material diversity in mattresses, Licocene® products make recycling easier compared to standard market alternatives like latex. Clariant's offering for substituting the use of hazardous substances in certain applications also helps address chemical safety in recycling activities. Other products focus on increasing the durability of materials.



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# Driving Sustainability

## Clariant and its products are at the forefront of efforts to reduce a certain class of harmful emissions in China.

When Li Tao got a call from a prospective customer back in October of 2016, he quickly realized that this wasn't going to be just a regular inquiry. Li is the general manager of Sheng Da Powder Coating, a company based in Tianjin, China's fourth-largest city. »The boss of a new bike manufacturer called me. He wanted to meet to discuss the production of a new color-matched powder coating«, Li remembers. »I knew it was urgent because he drove overnight from Zhenjiang to Tianjin just to meet me.« That's 1000 kilometers, or a ten-hour drive, up the coast. The customer was looking for a new brilliant orange-shade coating that had to be weather-resistant, heat-stable and free of heavy metals. »The biggest problem for me was that he needed the product delivered the following week«, Li says.

As it turned out, the orange tint in question was the trademark color of Mobike, the world's largest bike-share operator. The company, more accurately known as Beijing Mobike Technology Co., Ltd, runs a station-less system for bike sharing. It operates over five million bikes in more than 160 Chinese cities and has branched out to many other markets – from Singapore and Rotterdam to Florence and Newcastle. Mobike offers bike rides for as little as one Yuan or around 16 U.S. cents per hour. The service is extremely popular in China, with Mobike's bright orange bikes becoming ubiquitous. The quick, easy and eco-friendly service has had a huge impact both on Chinese street scenes and the habits of

millions of commuters. With its ever-expanding operations, Mobike has put high demands on suppliers like Sheng Da – not only in terms of volume and speed. Mobike requires solutions that are extremely durable as well as sustainable – hence the urgent request for a heavy-metal-free powder coating. »With little time for testing, I decided I had to go with products I could trust«, says Li. »And so I turned to Clariant.«

Li is not alone. Clariant and its products are at the forefront of a growing trend in China towards both higher quality and sustainability. Its Pigments Business Unit for example helps a whole range of manufacturers and their supplying industries to meet ever-stricter governmental regulations. One of the main concerns are emissions of volatile organic compounds or VOCs. These are among the most common air pollutants, with solvents being a major source. »VOCs have come under intense scrutiny by environmental authorities«, says Margaret Soong. She is Clariant's Head of Sustainability & Regulatory Affairs in Greater China. »China has several of the world's most polluted cities within its borders and the effects are becoming a major public health threat«, Soong explains. »Studies show that asthma cases in China have risen dramatically over the past couple of decades, coinciding with ever-deteriorating air quality.« The risks associated with industrial VOCs are compounded by the fact that these substances are often harmful at very low concentrations and the health problems they can cause can be cumulative and slow to develop. A number of VOCs are known carcinogens. »Chinese authorities are responding with a significant amount of new legislation to control VOC emissions«, says Soong. Whole industries are thus scrambling to meet the new standards and deadlines.

# 99.9



**Clariant's catalysts** reach VOC conversion rates as high as 99.9%, well exceeding current requirements and regulations worldwide.

**Margaret Soong**  
Head of Regional Sustainability &  
Regulatory Affairs, Greater China

Some industries can substitute raw materials or the products used in manufacturing. Clariant provides such solutions for coatings, for example. They include mostly VOC-free powder coatings as in the case of Mobike's orange tint. There are also Clariant products tailored to water-based coatings that significantly reduce VOC. Another solution to the VOC problem involves capturing and reusing evaporated solvents. That makes a lot of sense, since it not only minimizes environmental and health risks but also reduces costs by reclaiming a useful product.

However, not all processes can be altered to avoid or reclaim VOCs. Another option therefore is to destroy VOCs in exhausts with the help of so-called recuperative thermal oxidizers, or RTOs. These basically burn off VOCs at high temperatures. This method, however, produces secondary pollutants. Clariant's Catalysts Business Unit has a much better trick up its sleeve. »Our catalytic oxidation systems, called EnviCat® VOC, directly combust VOCs at significantly lower temperatures, making for a much safer and less expensive process«, says Mike Shao. He heads Sales for Emission Control in China. »Our catalysts not only reduce energy requirements and secondary pollutants. They also reach conversion rates as high as 99.9 percent, well exceeding current environmental regulations worldwide.« On top of that, the EnviCat® VOC system takes up a lot less space, which can be especially important when retrofitting existing production equipment. As a result, Clariant's EnviCat® VOC catalyst solution has been implemented in a number of large plants especially in regions such as Beijing, Shanghai and Guangzhou.

»We are proud to be a driver for both innovation and sustainability in all of our markets«, says Jan Kreibaum, Head of Region Greater China and Korea. »In fact, we see both innovation and sustainability as the joint basis for creating value for our stakeholders.« Clearly, the message is getting across: the year 2017 saw Clariant being recognized in China for achievements in sustainability, innovation and corporate citizenship. The company was awarded the Sustainable Product & Service Award at Goldenbee CSR China Honor Roll in Beijing. In Shanghai, Clariant received the Chairman's Award from the Association of International Chemical Manufacturers (AICM). The company's own EcoTain® label, which highlights Clariant products that offer outstanding sustainability advantages, won the Sustainability Best Practice Award and the Sustainability Influencer Award as part of an event in Shanghai called »Heading Towards 2040: Corporate Innovation and Urban Sustainability.« »We also set up a Sustainability Working Group for the China Petroleum and Chemical

Industry Federation together with nine other multinational companies«, says Kreibaum, who leads this group. »The group drives a sustainability agenda for the chemical industry in China and hosted a sustainability forum with domestic chemical companies, significantly boosting Clariant's credibility in China's chemical industry«, he explains. The Clariant Energy Forum also made its regional debut in China. It brought together colleagues to share best practices and insights into trends and government policies related to energy efficiency in China. Clariant's eWATCH program, meanwhile, won the Best CSR Practice Award by the China Association of Enterprises with Foreign Investment. The list goes on. It has to, as Jan Kreibaum explains: »Now and in the future, offering sustainable and innovative solutions will not just provide more opportunities, but will become an undisputed necessity in our daily business.«

What's evident is that Clariant's persistent focus on high-quality solutions and sustainability is welcomed by manufacturers set to thrive in China's changing busi-

**»Our catalytic oxidation systems, called EnviCat® VOC, reach conversion rates as high as 99.9 %, well exceeding current environmental regulations worldwide.«**

**Mike Shao**  
Head of Sales  
Emission Control,  
Business Unit  
Catalysts



# »We are proud to be a driver for both innovation and sustainability in all of our markets.«

**Jan Kreibaum**  
Head of Region  
Greater China & Korea



# 5

**Mobike**, a bike-share service, operates about 5 million bikes in China and around the world.

ness environment. Like Li Tao's powder coating company. »Clariant first visited me in 2015«, he remembers. »But at the time I didn't purchase anything because, frankly, I thought the products were too expensive.« Clariant's sales reps persisted, always presenting Li with new products and new opportunities that could help upgrade his color portfolio and the quality of his coatings. Mobike's challenging order and Li's decision to turn to Clariant then became a turning point for him and his company. »At first, I was just one of many suppliers of coatings to Mobike, but my consistently good-quality coatings got me noticed«, he says. As a result, Mobike made Li's powder coating the standard shade on their

third generation of bikes and he's been successful in his latest bids to get even more business. »Now I am the major supplier to Mobike with over 50 % of the powder coating volume.« With Clariant's help he's helping to bring color as well as sustainability to millions of commuters.



# Assurance Report on the Non-Financial Performance Reporting

## To the Board of Directors of Clariant Ltd, Muttenz

We have been engaged to perform assurance procedures to provide limited assurance on the non-financial performance reporting of Clariant Ltd and its consolidated subsidiaries (›Clariant‹) for the year ended 31 December 2017.

## Scope and Subject matter

Our limited assurance engagement focused on the 2017 non-financial performance indicators published in the Integrated Report 2017 of Clariant:

- a) The »Intellectual Capital« indicators on page 132, the »Manufactured Capital« indicators on page 133, the »Raw Material Procurement according to Regions« indicators on page 136, the »Human Capital« indicators on page 139, the »Occupational Health, Safety and Well-being« indicators on page 142, the »Relationship Capital« indicators on page 144, the »Sustainable Value Chain« indicators on page 148 and the »Natural capital« indicators on page 156; and
- b) The management and reporting processes to collect and aggregate the data as well as the control environment in relation to the data aggregation of these data.

## Criteria

The reporting criteria used by Clariant are described in the internal reporting guidelines and define those procedures, by which the non-financial performance indicators are internally gathered, collated and aggregated. The internal guidelines are based on the GRI Sustainability Reporting Standards (GRI Standards) published by the Global Reporting Initiative (GRI).

## Inherent limitations

The accuracy and completeness of non-financial performance indicators are subject to inherent limitations given their nature and methods for determining, calculating and estimating such data. Our assurance report

should therefore be read in connection with Clariant's internal guidelines, definitions and procedures on non-financial performance reporting.

## Clariant responsibilities

The Board of Directors of Clariant is responsible for both the subject matter and the criteria as well as for selection, preparation and presentation of the information in accordance with the criteria. This responsibility includes the design, implementation and maintenance of related internal control relevant to this reporting process that is free from material misstatement, whether due to fraud or error.

## Our responsibilities

Our responsibility is to form an independent conclusion, based on our limited assurance procedures, on whether anything has come to our attention to indicate that the non-financial performance indicators are not stated, in all material respects, in accordance with the reporting criteria.

We planned and performed our procedures in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (revised) ›Assurance engagements other than audits or reviews of historical financial information‹. This standard requires that we plan and perform the assurance engagement to obtain limited assurance on the identified non-financial performance indicators.

A limited assurance engagement is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks. Consequently, the nature, timing and extent of procedures for gathering sufficient appropriate evidence are deliber-

ately limited relative to a reasonable assurance engagement and therefore less assurance is obtained with a limited assurance engagement than for a reasonable assurance engagement.

#### **Independence and quality controls**

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

Our firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

#### **Summary of work performed**

Our limited assurance procedures included, but were not limited to the following work:

- Reviewing the application of Clariant’s internal guidelines
- Interviewing Clariant representatives at Group level responsible for the data collection and reporting
- Interviewing Clariant representatives in Indonesia, India and Brazil responsible for the data collection and reporting by phone
- Performing tests on a sample basis of evidence supporting the non-financial performance indicators as outlined in the scope and subject matter section concerning completeness, accuracy, adequacy and consistency
- Inspecting the relevant documentation on a sample basis

- Reviewing and assessing the management reporting processes for non-financial performance reporting and consolidation and their related controls

We have not carried out any work on data other than outlined in the scope and subject matter section as defined above. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our assurance conclusions.

#### **Limited Assurance Conclusion**

Based on the procedures we performed, nothing has come to our attention that causes us to believe that

- a) The 2017 non-financial performance indicators of Clariant as described in the scope and subject matter section are not prepared and disclosed in all material respects in accordance with Clariant’s internal guidelines and procedures; and
- b) The management and reporting processes to collect and aggregate the data as well as the control environment in relation to the data aggregation are not functioning as designed.

PricewaterhouseCoopers AG



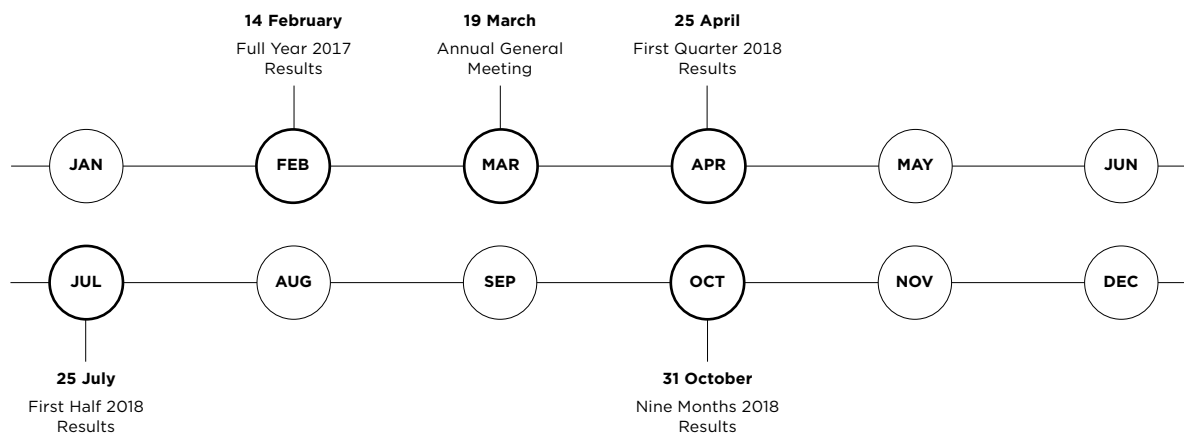
Dr. Marc Schmidli



Raphael Rutishauser

Basel, 21 February 2018

# Financial Calendar 2018



## Publication Details

### Publisher

Clariant International Ltd, Muttenz

### Contact

Investor Relations  
Anja Pomrehn  
Phone +41 61 469 67 45  
Fax +41 61 469 67 67

Group Communications  
Kai Rolker  
Phone +41 61 469 63 63  
Fax +41 61 469 75 49

### Editorial office, project management

Claudia Kamensky  
Joana-Isabel Kelp

Financial Editor  
Philipp Baberschke

### Website

[www.clariant.com](http://www.clariant.com)

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### Editor and integrated reporting consultant

Sustainserv, Zurich and Boston

### Concept

Mutabor Design GmbH, Hamburg

### Design, graphics, layout and editorial reportages

Kammann Rossi GmbH, Cologne

### Credits

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### Printing

Neidhart + Schön, Zurich

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Print | ID 53232-1802-1003



# Five-Year Group Overview

## 2013 - 2017

CHF m	2017	2016	2015	2014	2013
<b>Group sales</b>	<b>6 377</b>	5 847	5 807	6 116	6 076
Change relative to preceding year					
in Swiss francs (%)	<b>9</b>	1	-5	1	1
in local currencies (%)	<b>9</b>	2	3	5	4
<b>Operating income before exceptionals</b>	<b>673</b>	622	596	585	574
<b>Operating income</b>	<b>496</b>	512	496	525	470
<b>EBITDA before exceptionals</b>	<b>974</b>	887	853	867	858
<b>EBITDA</b>	<b>813</b>	785	767	923	797
<b>Net income</b>	<b>302</b>	263	227 <sup>1</sup>	235 <sup>1</sup>	323 <sup>1</sup>
<b>Basic earnings per share (in CHF)</b>	<b>0.84</b>	0.78	0.67	0.55	0.98
<b>Distribution per share (in CHF)</b>	<b>0.50</b>	0.45	0.40	0.40	0.36
<b>EBITDA margin before exceptionals (%)</b>	<b>15.3</b>	15.2	14.7	14.2	14.1
<b>Return on invested capital (ROIC) (%)</b>	<b>10.2</b>	10.2	9.7	9.4	9.5
<b>Operating cash flow</b>	<b>428</b>	646	502	334	301
<b>Investment in property, plant and equipment</b>	<b>248</b>	297	374	310	292
<b>Research &amp; Development expenditures</b>	<b>211</b>	206	206	213	199
<b>Depreciation and amortization</b>	<b>301</b>	265	257	282	284
<b>Net working capital</b>	<b>1 281</b>	1 087	1 027	1 169	1 036
in % of sales	<b>20.1</b>	18.6	17.7	19.1	17.1
<b>Total assets</b>	<b>8 229</b>	8 365	7 461	7 915	8 174
<b>Equity (including non-controlling interests)</b>	<b>2 939</b>	2 546	2 494	2 733	2 780
<b>Equity ratio (%)</b>	<b>35.7</b>	30.4	33.4	34.5	34.0
<b>Net financial debt</b>	<b>1 539</b>	1 540	1 312	1 263	1 500
<b>Gearing ratio (%)</b>	<b>52</b>	60	53	46	54
<b>Employees (in FTE)</b>	<b>18 135</b>	17 442	17 213	17 003	18 099

<sup>1</sup> Continuing operations

# Everything Counts

CLARIANT INTERNATIONAL LTD  
Rothausstrasse 61  
4132 Muttenz  
Switzerland  
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[WWW.CLARIANT.COM](http://WWW.CLARIANT.COM)