

CRODA



# Connecting to faster growth markets

Sustainability Report 2017

We are the name behind the high performance ingredients and technologies in some of the biggest, most successful brands in the world; creating, making and selling speciality chemicals that are relied on by industries and consumers everywhere.

## In this year's report

# 2017

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## Global mega trends

### Changing demographics

There is unprecedented change in world demographics.

### Fragile world

The continuing accumulation of greenhouse gases in the atmosphere is the main cause of global warming.

### Demand for transparency and trust

Consumers, empowered by digitalisation, have changing expectations.

### Digitalisation and interconnectedness

Technology advances are reshaping the world we live in, with digitalisation transforming consumer behaviour.



Read more about these global mega trends and our response on **p02**

## Where we operate

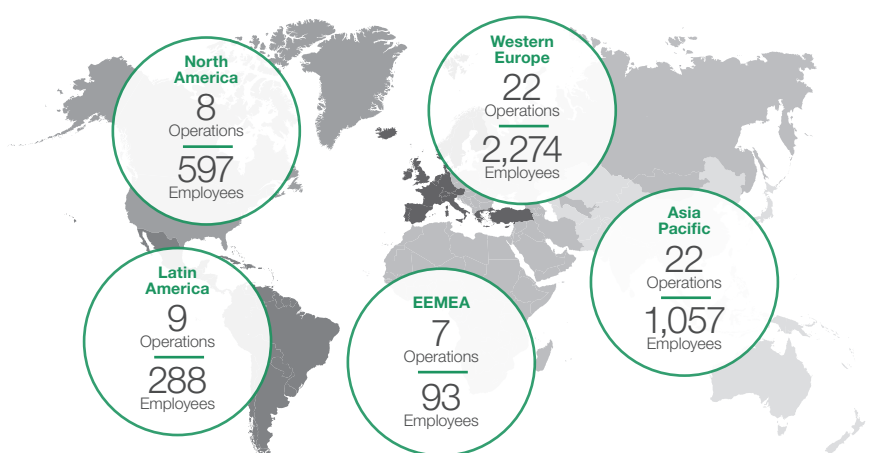
# 37

Countries across the world

# 4,309

Employees

Every day our global team works together, inspiring and influencing each other and our customers.



## Our Material Areas

# 10



**Product Stewardship**



**Product Design**



**Quality Assurance**



**Environmental Impact**



**Process Safety**



**Occupational Health & Safety**



**Our People**



**Knowledge Management**



**Diversity & Inclusion**



**Community Education & Involvement**



Read more about our Strategic Approach on **p08** and see **p32** for details on our performance against targets within these Material Areas

## Global Reporting Initiative (GRI)

Our 2017 report is in accordance with the GRI Standards: Core for the period 1 January 2017 to 31 December 2017. Throughout this report, look for the green reference boxes as shown below, which indicate where information against our chosen GRI disclosures can be found.

**GRI Standard Number**



Read our full 2017 GRI Report online at [www.croda.com/GRI](http://www.croda.com/GRI)

# Greater growth, greater sustainability



**Steve Foots**  
Group Chief Executive



As we continue to grow so too does our passion for sustainability. It is a key component of how we are judged and how we judge ourselves, continuing to decouple our growth and increasing shareholder value from our impact on the environment."

This is our tenth year of sustainability reporting. Over this time, underpinned by strong governance (p31), we have grown in knowledge and stature, and we are proud of the many remarkable achievements and successful sustainability initiatives that have come from all areas of our Business. This diversity is one of the most rewarding elements in our continuing sustainability story. Rather than being prescriptive, sustainability has become inherent in our thinking.

Our year-on-year improvement in many of the external sustainability measures, such as CDP and EcoVadis reflect the strong evolution of our sustainability programme (p06).

In our response to global mega trends (p02) we are driving consistent top and bottom line growth through product and process innovation, focusing on the future challenges and opportunities they are creating. This is delivering greater differentiation and further widening the gap between ourselves and our peers.

## Sustainability growing in all business sectors

Together with innovation, quality and service, sustainability is now firmly established as a fourth metric in all of our consumer facing businesses. Personal care consumer goods companies have industry leading programmes with commitments to increase their sustainability credentials. As an industry leader, our role is to proactively contribute to these programmes, enabling our customers to meet or exceed consumers' expectations. While some of our non-consumer facing market sectors may have different terms of reference for their sustainability programmes and goals, we are promoting what we consider to be best practice across the many different industries we serve. In 2016 we introduced the concept of 'intrinsic' and 'extrinsic' sustainability benefits, which help our customers across many industries make informed decisions about our products.

## Acquisitions contributing sustainability

The 11 acquisitions we have made in my tenure as CEO all deliver tangible sustainability benefits in their respective market sectors. Our 2017 acquisition of Enza Biotech is a great example as it supports our development of next generation renewable surfactants. Using biotechnology to alter the chemical structure of naturally derived compounds that have superior functionality and compatibility, their environmentally friendly production process yields products that are 100% renewable and biodegradable.

## Making a positive difference

Our uniquely different position relative to our predominantly petrochemical based peers is illustrated by our high consumption of renewable, sustainable raw materials. Most of these raw materials are plant based, and during plant growth photosynthesis

occurs, a reaction that takes carbon dioxide (CO<sub>2</sub>) from the atmosphere. For some feedstocks this removal of atmospheric CO<sub>2</sub> gives us a 'carbon negative' starting point for our processes.

Continuing our focus on carbon and taking responsibility in meeting the challenges of climate change, we recently commissioned our pioneering bio-ethylene oxide plant in North America. Here we are using bio-ethanol as feedstock to replace petrochemicals in the manufacture of ethylene oxide, enabling the manufacture of 100% bio-based surfactants (p16).

## Sustainable culture

Our 2017 Global Employee Culture Survey confirmed the shared values throughout our Business, a vital differentiator in our continued success. Investing in our people and the communities in which we operate is a key focus with over 107,000 recorded training hours during the year and 5,073 reported 1% Club volunteering hours, 50.0% of which was spent delivering educational programmes (p25).

## Looking forward

Our coherent approach to sustainability and our focus on helping customers achieve their current and future sustainability targets will ensure our continued success through 2018 and beyond.

I would like to thank everyone across the Group for the contributions they make to sustainability every day.

**Steve Foots**  
Group Chief Executive

## Market Drivers

# Maximising opportunities for growth and innovation

To maximise opportunities for growth, we use the global mega trends to shape our strategy and business model, which ensures that we can deliver innovations that satisfy the unmet needs of our customers.

### Global mega trend

## Changing demographics

### Consequences

There is unprecedented change in world demographics. People in developed economies are living longer and have more income and better access to buy a wider range of products.

In the developing world, a population increase of two to three billion is forecast between now and 2050, driven by lower mortality rates. In addition, an expanding middle class is expected to attain Western levels of consumerism, generating new markets for products that make a difference to living standards.

### What this means for our industry

- Growing need for consumer products that use our ingredients
- Increasing demand for anti-ageing, beauty and health products as incomes rise and consumers' expectations change
- Demand for increased crop yields to support the growing population
- Demand for energy saving materials and increased bio-based content to mitigate against carbon emissions in supply chains.

### Our opportunities

More growth in developing regions and demand for new products that contain our innovative ingredients.

### Our response

- Close working partnerships with our customers, smart partners and suppliers to develop innovative ingredients with intrinsic and extrinsic sustainability benefits across all our market sectors (p30)
- Local market teams who are close to our customers, with the right global market sector insight and expertise to meet rapidly changing market demands (p09, p18, p29 and p36)
- Investment in local research and development laboratories in growing regions
- Capital investment in manufacturing assets in Asia and Latin America to reduce supply chain length and bring supply closer to our customers.

## Fragile world

### Consequences

The continuing accumulation of greenhouse gases in the atmosphere is the main cause of global warming, the consequences of which are rising sea levels and an increase in the frequency of extreme weather. Both impair the productivity of the land to supply food and water for the growing global population, and bring an increased focus from international organisations on restricting global warming and climate change.

### What this means for our industry

- A demand for increased product performance from lower levels of active ingredients
- Need to minimise environmental and social impact along the entire customer supply chain
- Emergence of taxes and incentives for businesses to reduce the net environmental burden
- A move away from petrochemicals towards renewables and industrial biotechnology.

### Our opportunities

From our unique position in the use of renewable raw materials, we can reduce the net impact of our Business by facilitating our customers' transition to more sustainable ingredients, and through our applications science, create ingredients that have a positive benefit in use.

### Our response

- In house regulatory experts sitting on industry wide committees to inform and shape future policy
- New product developments assessed against the globally recognised 12 Principles of Green Chemistry framework, to ensure that they are as sustainable as they can be (p12)
- Investment in our North American bio-surfactants plant to produce the bio-based ECO range of ingredients, both reducing reliance on fossil fuels and eliminating the need for rail transportation of ethylene oxide (p16)
- Cradle-to-gate life cycle assessment to assess the impact of our ingredients and identify where we can make further reductions in our carbon footprint (p12)
- Report to CDP climate change, forest and water disclosures.

## Global mega trend

## Demand for transparency and trust

## Consequences

Consumers, empowered by digitalisation, have changing expectations. They want greater choice and control, demanding more transparency in the products and services they use and anywhere, anytime access to information.

They increasingly expect businesses to operate in a transparent and accountable way, and take greater responsibility for their supply chains and the impact of their products, with increasing calls for improved performance, purity and cost-effective solutions.

## What this means for our industry

- Clear demonstration of transparent ethical and social accountability globally
- Need for collaboration through the whole supply chain to trace material provenance.

## Our opportunities

Our extensive product claims substantiation capabilities are supported by a wealth of technical information that assists our customers in making the right choices for their consumers.

## Our response

- Maintain and enhance our reputation as a high quality ingredient supplier by meeting and surpassing regulatory requirements
- A corporate Ethics Committee which ensures that supply chain risks are identified, prioritised and controlled (p15)
- Work with specialists to characterise the physical palm oil derivative supply chains, leading to transparency of provenance (p15)
- Actively manage all risks that could affect the reliability of our service to customers: ethics, human rights, process safety, product safety, quality assurance and business continuity
- Ensure that all manufacturing sites are certified against appropriate Safety, Environment, Quality and GMP standards (p06).

## Digitalisation and interconnectedness

## Consequences

Technology advances are reshaping the world we live in, with digitalisation transforming consumer behaviour. Digital technologies make it easier for their voices to be heard and increase the speed at which new trends are adopted.

The evolution of the internet has also enabled a significant advance in our ability to gather, analyse and distribute data, and turn it into information and knowledge.

## What this means for our industry

- Consumer demand for niche products
- Increase in small independent ('indie') customers and virtual communities demanding a different level of service
- Need for agile operations
- Increased use of data science and robotics to shorten product development life cycles.

## Our opportunities

Opportunity to connect more dynamically with both our current and future customers, and to use data and robotics to improve efficiency and effectiveness from new ingredient development to site operations.

## Our response

- Local sales and research and development teams work closely with small start-ups on niche ingredient development
- Flexible operating assets and supply chains enable the production and delivery of small batch sizes to meet changing customer demands (p04)
- Our acquisition of Cutitronics, which enables us to utilise the latest digital technology in premium skincare
- Appointment of a Chief Digital Officer to grow our digital strategy
- Creation of a process informatics group to analyse and optimise plant performance
- Investment in our Centre of Innovation for Formulation Science at the Materials Innovation Factory at the University of Liverpool, to build a data centric approach to innovation.

## Business Model

# Creating value

We create, make and sell innovative speciality chemical ingredients, generating long term value through collaborative relationships and our commitment to sustainable innovation.

### Input

#### Consumer need

Influenced by global mega trends, consumers dictate their needs

#### Customer need

Our customers seek innovative and sustainable ingredients that address consumer needs

### Our relationships and assets

#### Relationships

Customers

Our people

Open innovation partnerships

Smart partnerships

Supply chain partnerships

Investor base

→ Read more about our relationships on page 30

#### Assets

Our culture

Protected intellectual property

Local innovation centres

Valuable green chemistries

Agile regional manufacturing base

Strong cash generation for reinvestment

## Croda

### Delivering value across our market sectors

#### Personal Care

Focusing on ingredients for skin, hair, sun protection and colour cosmetic products

#### Life Sciences

Comprising of three complementary businesses, Health Care, Crop Protection and Seed Enhancement



#### Engage

Working closely with our customers and supply chain we identify unmet consumer needs around the world



#### Create

We create innovative and sustainable ingredients and technologies that meet consumer needs

### Sustainability connects every aspect of our Business

Sustainability is an increasing requirement and a differentiating factor for our customers and their consumers. Our sustainability programme is enhancing our reputation for producing the best sustainable ingredients whilst reducing our environmental burden on the planet and our local communities, helping our customers to manage their risk and achieve their own sustainability objectives.

### Performance Technologies

Targeting faster growth technologies in Smart Materials and Energy Technologies and continuing to develop its presence in Home Care and Water Treatment



#### Make

Our manufacturing sites run flexible operations to consistently high standards across the world

### Industrial Chemicals

A small, diverse sector based on selling co-streams, developing novel niche applications and undertaking toll processing



#### Sell

We generate revenue through our direct selling model, with sales, technical and warehousing support local to our customers

### Supported by our culture

Our 'One Croda' culture exemplifies the values, behaviours and attitudes we expect of ourselves. We want our people to feel empowered and recognised for their commitment, creativity and innovation. Each individual should be treated fairly and equally, with openness and transparency.

## Output

### Customer product

Using our innovative and sustainable ingredients, our customers increase the benefits of the products they manufacture

### Consumer benefit

Consumers all over the world benefit from the performance of our ingredients that address their unmet needs

## The value we add

### High performance, high quality innovative products with the sustainable benefits and claims validation our customers want

- Read more about sustainable product innovation on page 10

### Minimising our impacts within our customers' supply chains

- Read more about planet and process on page 19

### Ensuring the success and safety of our people and supporting the communities in which we operate

- Read more about people and community on page 25

### Superior financial performance

- See more in our 2017 Annual Report & Accounts

### Strong returns to shareholders

- See more in our 2017 Annual Report & Accounts

## Our Progress

# Looking back over 10 years

This year marks the tenth anniversary of publishing our Sustainability Report, where we share details on our product, planet and people activities, which cover all aspects of our Business.

### Key milestones over the past 10 years



#### Profit before tax

£60.9m in 2007

£320.3m in 2017



#### Number of employees

3,671 in 2007

4,309 in 2017



#### % of energy from non-fossil fuel sources

2007 3.9%

2017 24.1%

Our increasing use of non-fossil energy has avoided burning the equivalent of over 900,000 barrels of oil since 2007

#### Total energy generated through investment in site renewable energy projects (GJ)

2,350,000

between 2007 and 2017

Equivalent to powering over 179,000 average UK homes for a year



#### Total waste sent to landfill (Te)

9,111 in 2007

1,771 in 2017

This reduction would fill 560 average household waste trucks



#### Total water usage (m³)

13,239,672 in 2007

8,011,330 in 2017

This reduction would fill 2,090 Olympic swimming pools





## Products launched since 2012

377



## Average % of renewable raw material content within new products since 2012

62%

## Average number of the 12 Principles of Green Chemistry that our new products complied with

9.0 in 2012

10.6 in 2017

## Highlights of external recognition

- Listed in FTSE4Good since 2008
- Placed within Britain's Most Admired Companies since 2009
- CDP Climate Change Disclosure score advanced from E in 2011 to A- in 2017 and Climate Disclosure Leaders in 2013
- Payroll World 2012 'Best Compensation & Benefits Team' Award for our 1% Club
- The Job Crowd 'Top Companies for Graduates to Work For' since 2012/13
- Global 100 Most Sustainable Organisations in 2013 and 2014
- EcoVadis scorecard of 62 in 2014 to 83 in 2017, maintaining our Gold rating
- Trucost, Natural Decoupling Leader from 2014

## % of employees in a sharesave scheme



## Total number of reported training hours

93,000 in 2010 107,000 in 2017

## Total reported 1% Club hours since 2010

42,650

# Strategic Approach Sustainable Solutions



## Delivering Growth

Through our direct selling business model, our people build intimate relationships with our customers large and small, working closely with them to target niche, rapidly growing markets where our innovative and sustainable approach is valued. Our flexible and agile structure enables our people to stay close to our customers around the world, whilst working together as one global team to respond quickly to demands identified by changing demographics in a fragile world.



## Driving Innovation

Innovation plays a critical role across our Business, with dedicated business sector research and development teams creating new ingredients in collaboration with our customers. Working with our open innovation partners and through smart partnering, we identify unique opportunities that add value to our customers' products and satisfy the needs of their consumers. It is a combination of the ingredients we create and the way we operate that enables our customers to build on our innovations.

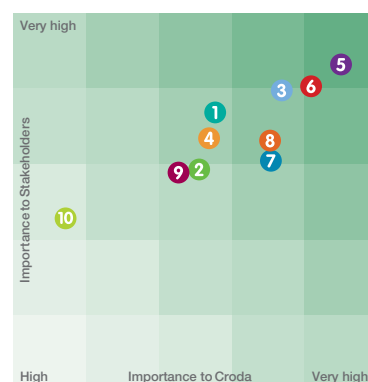


## Sustainable Solutions

We continue to build on our renewable raw material heritage to create, make and sell sustainable solutions today, to positively influence tomorrow. By investing in innovative product design and flexible operations, we are working with our supply chain to develop ingredients that deliver more benefit, with less impact. This, coupled with our participation in regulatory debates, ensures that we are providing solutions to the opportunities presented by our global mega trends.

### Our Priority Matrix: Material Areas

1 <b>Product Stewardship</b>		6 <b>Occupational Health &amp; Safety</b>	
2 <b>Product Design</b>		7 <b>Our People</b>	
3 <b>Quality Assurance</b>		8 <b>Knowledge Management</b>	
4 <b>Environmental Impact</b>		9 <b>Diversity &amp; Inclusion</b>	
5 <b>Process Safety</b>		10 <b>Community Education &amp; Involvement</b>	



### ISO 26000

In 2017 we began applying the ISO 26000 standard to provide additional guidance and help to drive the continual improvement of our sustainability strategy. Using a gap analysis provided by a specialist agency, Bureau Veritas,

we have identified areas of strengths and weaknesses surrounding our application of the standard and, in 2018, we will be working to identify and implement actions based on this analysis.

→ Read more about our application of ISO 26000 on **p31**

### United Nations Sustainable Development Goals (SDGs)

The SDGs were introduced in 2016 as a call to all countries, organisations and individuals to improve the lives of people everywhere by 2030.

We have started to take a much closer look at which goals our Business can offer the greatest contribution to. Our initial analysis identified 10 goals where we can make a concrete link, examples of which are outlined here. In 2018 we will develop stronger connections with the SDGs and communicate how our Material Areas and strategy align to them.

2 <b>ZERO HUNGER</b>	Our seed enhancement business, Incotec, helps farmers to increase their crop yields (p11).
3 <b>BETTER HEALTH AND WELL-BEING</b>	Process and occupational health and safety are of the utmost importance to us (p23).
4 <b>QUALITY EDUCATION</b>	We have a global Science, Technology, Engineering and Maths programme for our local communities (p28).
7 <b>AFFORDABLE AND CLEAN ENERGY</b>	Our Energy Technologies business supplies innovative products for use in clean energy generation (p12).
8 <b>DECENT WORK AND ECONOMIC GROWTH</b>	We have projects to improve supply chain ethics and transparency (p15).

9 <b>INDUSTRY, INNOVATION AND INFRASTRUCTURE</b>	Open innovation and smart partnering are of key importance to us (p9, p18 and p24).
12 <b>RESPONSIBLE CONSUMPTION AND PRODUCTION</b>	We show leadership in the physical transformation to certified sustainable palm oil (p15).
13 <b>CLIMATE ACTION</b>	Our ECO product range has a reduced carbon footprint when compared to traditional alkoxyates (p16).
14 <b>LIFE BELOW WATER</b>	We have an industry leading EU Ecolabel approved range of biodegradable marine lubricant products (p24).
15 <b>LIFE ON LAND</b>	We are contributing to the protection of rainforest in Indonesia through a carbon offsetting programme (p22).

# Meeting the unmet needs of African Consumers

There is a growing consumer trend towards a natural look within the African hair care market

## Investing in...

### People

We commissioned and supported a number of focus groups with African women to understand better their personal care regimes, which included hearing about the challenges they face in trying to maintain healthy hair. This has given our research and development team new insight into the problems these consumers have, enabling them to learn more about, and invest in, new analytical and testing equipment to assess our ingredients on African hair.

### Niche

The hair of most Africans grows slowly and tends to be difficult to manage due to its brittle nature. The products currently available in this market are generally not meeting African consumer needs because they have been developed for Afro-American hair, which has different properties. This is why some consumers resort to braiding that damages the hair, which can lead to receding hairlines and baldness in the long term. Alternatively, they often apply relaxer products to straighten the hair, which can harm the hair and scalp and can also have a negative impact on the environment during disposal due to their chemical profile.

### Technology

The Centre of Excellence we have opened in South Africa uses bespoke and unique hair testing methods for the African market. Using this technology, we can analyse the performance of our active ingredients to meet consumer demands, knowing that due to our high percentage of natural, renewable raw materials and the sustainability information we have, we can also minimise any environmental impacts. Through our 'Proudly Tested in Africa' initiative, we will continue to gain direct consumer feedback in order to offer a more comprehensive and targeted data package to our customers.

### Smart Partnering

To focus on meeting the needs of African consumers, we are working extensively with industry experts, local universities and our customers, both multinationals and local manufacturers, to ensure that we all have a greater understanding of the African hair physiology and current market landscape.

# Sustainable Product Innovation

Making high performance, high quality products with the sustainable benefits our customers want and need, to meet consumer demands

## Key Material Areas



**Product Design**  
Deliver the most innovative and sustainable ingredients to our customers



**Product Stewardship**  
Ensure that the ingredients we produce contribute positively to the environment and society throughout their life cycle



**Environmental Impact**  
Minimise the impact of our operations



**Quality Assurance**  
Contribute to, and proactively seek, higher quality standards across product and operational aspects of our Business to ensure consumer safety

We know that it is only by being close to our customers that we can understand and fulfil their needs, finding new ways to improve sustainable product performance and reduce environmental impacts.

In 2016 we introduced the concept of intrinsic and extrinsic sustainability benefits. Intrinsic (p12) refers to attributes such as renewable raw material content, product purity and cradle-to-gate life cycle assessment. We assess the compliance of our new products with the 12 Principles of Green Chemistry and in 2017 our New and Protected Products (NPP) scored an average of 10.6 out of 12. The growth of crops from which many of our raw materials are derived, removes CO<sub>2</sub> from the atmosphere, resulting in low carbon footprints for many of our products.

The extrinsic (p14) sustainability impacts of our products include the social, environmental and financial benefits that our products have in use. We are working to quantify these benefits for some of our product application areas, calculating associated carbon savings.

Our rigorous quality assurance processes ensure the satisfaction of our customers and the safety of consumers. We are leading the way in the transformation to Roundtable on Sustainable Palm Oil (RSPO) certified palm oil derivatives, and are continually striving to increase transparency in our raw material supply chains.

All of this activity and more, differentiates and futureproofs our Business, whilst offering our customers many product advantages.

## Highlights

61.1%

of our raw materials were from renewable sources in 2017, an industry leading position

Top 1%

is where we are placed amongst all companies assessed by the sustainability platform EcoVadis, with a score of 83/100

60%

increase in sales of products made with RSPO certified palm oil derivatives compared to 2016

94%

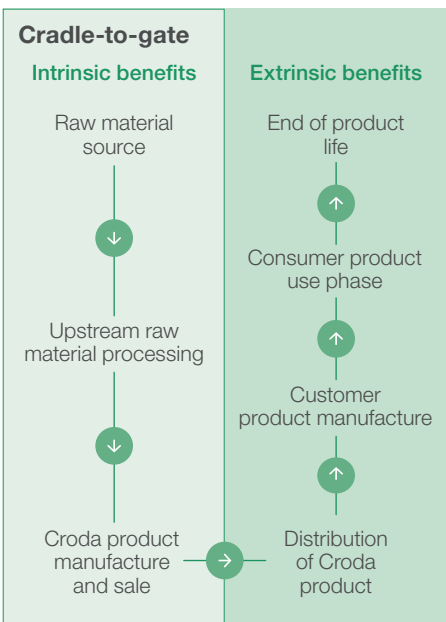
of our Rising Star products, those expected to be a top 50 seller in the next five years, offer a known sustainability benefit in use

## Life Cycle Assessment

In order to continue developing low carbon, sustainable products to meet our customers' requirements, we need to fully understand where the current environmental impacts of our products lie.

We have recently invested in extending our in-house life cycle assessment (LCA) capability, using internationally recognised software to model the cradle-to-gate LCAs of selected product families, following ISO 14067 and examining the climate change impact category.

In 2017, our focus was on our new ECO product range of 100% bio-based surfactants, where we have shown that switching to bio-ethylene oxide reduces the carbon footprint of the resulting ECO products (p16). We will continue to look at additional product families, prioritising according to business and customer needs.



Life cycle of our products

# Incotec: Our Seed Enhancement Business

## Seed enhancement leads to sustainable crop growth

We acquired Incotec, a seed enhancement business in 2015. With the world's growing population and declining availability of arable land, this innovative business is hugely important in terms of the extrinsic sustainability benefits we can deliver to our customers through our seven technologies.

### Seven ways to boost your yield

#### 1. Upgrading

We can use our X-ray image sorters to sort primed seeds into lots of equal quality. This allows for uniform growing in the field and much more efficient harvesting

#### 2. Priming

Triggering and controlling seed germination reduces the length of time and energy required in greenhouses

#### 3. Disinfection

Treatments that reduce or eliminate microorganisms, for example, fungi and bacteria in or on the seed

#### 4. Film coating

Application of a very thin layer of polymer to the seed, often mixed with an active ingredient, microbial or biostimulant, with virtually no change in size or weight of the seed

#### 5. Encrusting and pelleting

Adapting the shape of the seeds by applying layers of coating material on it. This makes the shape and size of the seeds more uniform to allow for efficient sowing

#### 6. Application of actives and biologicals

Integrated in the seed coating or encrustment/pellet

#### 7. Analytical quality testing

Our testing covers a broad area, for example, determining the number of dust particles in a treated seed, through to seed health testing.

## 80-90%

reduction in the amount of plant protection product required when coating the seeds

Our priming process can overcome certain types of dormancy. For example, there are varieties of lettuce that will not germinate at temperatures over 20°C, resulting in energy intensive cooling when being cultivated in warmer climates. Our technology will allow these lettuces to germinate at up to 30°C, reducing our customers' energy requirements.



Incotec film coated corn seeds

Seed treatments can be integrated within our film coatings. This allows for a targeted application, stimulating root and plant growth and leading to enhanced nutrient uptake, as well as protecting the seeds from pests and plagues.

Over the first few weeks of plant growth, coating the seed leads to an 80-90% reduction in the amount of plant protection product required. This reduces the amount of chemicals sprayed onto crops, which can be harmful to both the farmer and the environment when spraydrift occurs. The requirement of fewer chemicals also results in an avoidance of greenhouse gas emissions, as agrochemical active ingredients can be energy intensive to manufacture.

## Improving the livelihood of farmers in Ethiopia

Teff is the most valuable seed crop in Ethiopia and a traditional staple due to its nutritional value. It accounts for the largest share of fertiliser and land use amongst crops in the country. A Teff crop tolerates water stress, and is therefore a reliable and low risk crop for farmers. However, the small size of the Teff seeds causes problems during sowing, making it difficult to control distribution in the field, which has a negative effect on the yield of the crop.

Our Incotec business is part of a subsidised Seed2Feed consortium, a project approved by the Netherlands Enterprise Agency (RVO.nl) under the Facility for Sustainable Entrepreneurship and Food Security (FDOV). As part of this project we have developed a pellet for Teff Seeds that doubles their size, increasing handleability and enabling more accurate planting. In field trials performed two years ago this saw a Teff yield increase of 80% per hectare. The pellets are also compatible with a mechanical row planter, to enable a more even sowing of the seeds. The aim is for local people to handle the pelleting process through a licence, and part of the project includes carrying out practical training in Ethiopia. Higher income from better prices and increased Teff productivity could transform the livelihood of Teff farmers across Ethiopia.



Teff fields in Ethiopia

## Increasing knowledge of product sustainability

Our aim is to provide our customers and other stakeholders with ever more detailed product information regarding all aspects of sustainability. For this reason, in 2016 we introduced the concept of intrinsic and extrinsic sustainability benefits. Both are of vital importance to us, our customers and end consumers.

- Intrinsic refers to attributes such as renewable raw material content, the purity of our products and cradle-to-gate carbon footprint
- Extrinsic refers to the social, environmental and economic impacts that our products may have in use by our customers or their consumers, or at their end of life.

The intrinsic and extrinsic sustainability benefits of our products reach across many different social, environmental and economic areas. Many of these contribute to the United Nations Sustainable Development Goals (SDGs) (p08).

## Intrinsic sustainability

Last year we continued to assess the compliance of our new products with the 12 Principles of Green Chemistry (Anastas, P. T.; Warner, J. C.; Green Chemistry: Theory and Practice, Oxford University

press, New York, 1998). The use of these principles has been embedded in our sustainability strategy since 2012. In 2017, on average, our New and Protected Products (NPP) complied with 10.6 out of 12 of the Principles.

During 2017, we focused on increasing our knowledge of the intrinsic sustainability benefits associated with our products, specifically their impact on climate change, up to the point of leaving our manufacturing site bound for our customer through life cycle assessment (LCA).

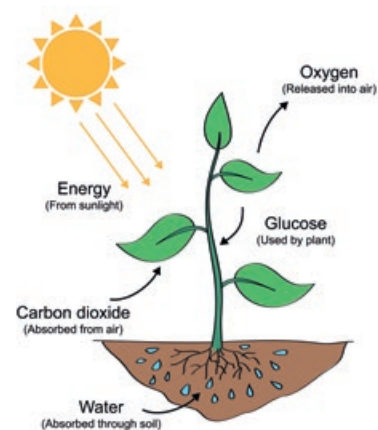
## LCA capability

In 2017, we appointed a Group Sustainability Specialist, a position created to focus on our LCA capability and to react to customer demands in this area. We adopted SimaPro, an internationally recognised LCA software package as our standard modelling tool, facilitating communication with a global community of LCA experts. This software will enable us to progress our studies to look at alternative environmental impact categories in addition to climate change, such as water depletion.

## Carbon negative feedstocks

Our greater focus on LCA capability is based on our belief that the carbon footprint associated with our products

will be increasingly requested by our customers as they start to calculate their scope 3 carbon emissions. We have an immediate advantage in this area as around two-thirds of the raw materials we use are renewable, 61.1% in 2017. This is a unique position amongst our peers in the speciality chemical manufacturing industry. Most of these renewable raw materials are plant based, and during plant growth photosynthesis occurs, a reaction that takes carbon dioxide (CO<sub>2</sub>) from the atmosphere as the plant uses it to generate sugars.



Plant photosynthesis

## Case studies

### Proving new energy technologies to reduce fossil fuel reliance

The historic Paris Agreement made at the 2015 United Nations Climate Change Conference, COP21, seeks to limit global warming to no more than 2°C above pre-industrial levels. If this is to be achieved, a huge reduction in the reliance on and use of fossil fuels is required globally by the end of the century. This provides an exciting market space with unprecedented levels of change and opportunity.

Our Energy Technologies business is looking to accelerate growth by supplying into new niches within this market, such as wind power, energy storage and hybrid vehicles. Our product innovation in these areas will build on our existing portfolio and expertise to offer customers more sustainability benefits, such as:

- Supplying Priolube™ 3970 for use in lubricants for wind turbine gearboxes to increase the operating efficiency of the turbines
- Developing leading technologies for friction reduction, including polymeric modifiers that enable fuel savings and provide wear reduction in automotive applications
- Leading the way in the supply of biodegradable phase change materials via our Crodatherm™ range
- Supplying an industry leading Priolube™ range of European Ecolabel biodegradable marine lubricants base fluids.

The key to decarbonising global energy demand will be collaboration and open innovation. Our Energy Technologies research team is part of a mixed industrial and academic consortium part-funded by the UK government's Faraday Challenge programme. The aim of the



Priolube 3970 is used in wind turbine gearboxes

project is to develop and demonstrate low cost 12V batteries for electrified vehicles. We will be developing niche additives with the potential to help the performance and longevity of battery systems.

For some feedstocks this removal of CO<sub>2</sub> from the atmosphere gives us a 'carbon negative' starting point for our LCA calculations. For example, a joint study with the University of Utrecht in the Netherlands, showed that on arrival at the gate of our manufacturing sites rapeseed oil, one of our primary raw materials, has a carbon footprint of -1.3kg CO<sub>2</sub>e/kg. This offers us positive differentiation over our predominantly petrochemical based competitors, and is a carbon saving we will be able to pass on to our customers through reliable carbon footprint data.

### Cradle-to-gate carbon footprints

Following ISO 14067 we have started work on calculating the cradle-to-gate carbon footprints of our products. Our initial focus has been on products within our new ECO range in order to investigate the carbon footprint reduction associated with moving to bio-based EO (p16).

A key output from our LCA work is the ability to locate where the largest contribution to the carbon footprints of our products lies, in order to identify ways for further reduction. For example, moving to biologically derived processes to generate some of our raw materials could reduce energy requirements during processing, and remove land use change impacts associated with some crop derivatives, thereby reducing the carbon

footprint of the associated end products. This is why we are building on our current biotechnology expertise across the organisation and investing in research in this area. This has recently been strengthened by the acquisition of Enza Biotech, a research enterprise that is focusing on the development of renewable surfactants using carbohydrate-based chemistry.

### EcoVadis gold status for the fourth time

The EcoVadis assessment methodology, which rates more than 20,000 companies, looks at environment, labour, fair business and sustainable procurement practices. We use EcoVadis as one of the demanding external references for continual improvement. Achieving Gold Status since our first filing, we have increased our score by 21 points from 62 to 83. Whilst a score of 83/100 is the highest amongst our peers, we are determined to progress further.



EcoVadis Gold rating for the fourth time in 2018

### Ensuring fair access and benefits sharing

The Nagoya Protocol is an international agreement that aims to fairly share benefits that come from using genetic resources (GRs), the final objective being the sustainable use of biodiversity globally. Each country has rights over the GRs that exist within their country. Any company seeking to make use of these GRs, or the traditional knowledge associated with their use, has both an ethical and legal obligation to respect those rights.



The Nagoya Protocol is an international benefits sharing agreement

At Croda, we are committed to ensuring that the raw materials utilised in our products are sampled and purchased in accordance with national and international Access and Benefit Sharing legislation and best practices. This is particularly relevant to our innovations in biotechnology and plant extracts and their derivatives.

## Case studies

### 10 Years of REACH

**The Strategic Approach to International Chemicals Management (SAICM) is an international policy framework to promote chemical safety around the world.**

The EU chemicals regulation, REACH, concerning the Registration, Evaluation, Authorisation and restriction of Chemicals, came into force on 1 June 2007, creating a single regulatory system for dealing with chemical substances. REACH fulfils many SAICM principles, particularly those relating to knowledge and information on chemicals and chemicals management.

To conform to REACH regulations, each producer and importer of chemicals in volumes of one or more tonne per annum (tpa) must register them with the European Chemicals Agency (ECHA) and submit information on their properties, uses and safe ways of handling them.

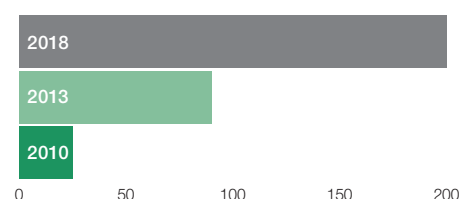
This registration obligation has been phased in with three key deadlines according to volume and hazard.

We have played a lead role in REACH registrations since the beginning, with our Product Safety and Regulatory Affairs (PSRA) team working to co-ordinate the generation and gathering of information to support registrations for products across our whole portfolio. As of 2017, registrations have been submitted for Phases 1 and 2 and are on target for Phase 3, which is the most important in terms of the range of products captured.

As we draw to the end of Phase 3 we have a much fuller picture of the properties of our product range. In most cases, this has highlighted the low impact that many of our products have on health and the environment. Where adverse effects have been identified, we have been able to set in place guidelines for our customers to handle our products safely and in a manner that minimises such impact.

<b>1 December 2010</b> Phase 1	> 1,000 tpa and certain high hazardous substances
<b>1 June 2013</b> Phase 2	≥ 100 tpa
<b>1 June 2018</b> Phase 3	≥ 1 tpa

#### Registrations by deadline



We have worked with regulators and trade associations to develop guidance for compliance, and we have a global team working to monitor national developments and legislation relating to Access and Benefit Sharing. This includes countries that have yet to ratify the Nagoya Protocol to allow us to provide robust assurance to our customers globally.

### Extrinsic benefits

As well as measuring the intrinsic benefits of our products, we are increasingly looking to understand and start to quantify the extrinsic sustainability benefits of our products. Of our 16 Rising Stars, products that are expected to be amongst our top 50 best sellers within the next five years, 15 have a promoted extrinsic sustainability benefit.

Inclusion of our products as ingredients in customer formulations can offer many kinds of extrinsic sustainability benefits: social, economic and environmental. One example being the reduction or avoidance of greenhouse gas (GHG) emissions in their application. Our Carbon Summit event, held in November 2017, helped us to pull together a diverse list of case studies where use of our products leads to a reduction or avoidance of GHG emissions in end applications. For example:

#### Priplast™ 3186

This product offers a high performance protective barrier when used within glass insulation sealants, leading to improved heat insulation and avoiding emissions associated with home heating. Priplast 3186 also increases the lifetime of the sealant and windows, helping to avoid extra manufacturing and the associated emissions.



Priplast 3186 offers improved heat insulation in glass sealants

#### Coltide Radiance

This home care product allows clothes to be washed many more times before they become bobbly or lose their brightness. This can result in a reduction in new clothes purchased and avoid the emissions associated with their manufacture.

#### B-Tough range

Supplied by our Smart Materials business, within Performance Technologies, these epoxy functional toughening ingredients offer enhanced flexibility, whilst maintaining the material's hardness. These products are used in the manufacture of wind turbine blades where inclusion enables the construction of longer blades, increasing the amount of energy the turbines can generate.

#### Health care excipients

Our products increase the efficacy and shelf life of the pharmaceutical actives they are formulated with. Typically, active ingredients are highly carbon intensive to manufacture, so reducing the volume of actives required offers customers a significant reduction in GHG emissions.

These are just a few of the many examples across our product ranges and businesses. In 2018, we plan to select several of these industry important application areas and quantify the carbon savings. Generating such data will help our customers in their understanding of the extrinsic sustainability benefits of our products, allowing improved accuracy of scope 3 GHG emissions reporting. It will also help us to visualise potential areas for future innovation in product design to offer even greater carbon savings.

### Case studies

#### Communicating on carbon

**In November 2017, we held a Carbon Summit at our global headquarters in the UK. This was an internal event attended by executive members, senior management and representatives from across the businesses, as well as Group functions.**

The event centred on our activities, carbon and our supply chain, examining the importance of scope 3 emissions to us and our customers. Examples from a wide selection of our businesses were reviewed, focusing on product application and where that application had led to positive sustainability impacts, such as avoidance of GHG emissions. We investigated where carbon saving measures could be implemented across our manufacturing sites as well as within our supply chains. The internal development of LCA capability was introduced and we developed a plan for its deployment.

The event featured guest speakers from Accenture to discuss carbon pricing, and ClimateCare to talk about their carbon offsetting projects and to see demonstrations of some project technologies (p22).

The outcome of the summit was to further develop our thinking and strategy for carbon measurement and reduction across the Group.



It is clearly apparent that Croda's level of internal engagement on sustainability is particularly high, which is very motivating to see."

**George Beechener**  
ClimateCare

#### CityStem™, Award Winning Pollution Defence Active

CityStem™ is a recent innovation within our Personal Care business. This natural active ingredient fights against visible and invisible pollution damage to the skin. Citystem has been awarded the 2017 PChi Fountain Award for Outstanding Active Ingredient in China.

As well as the extrinsic sustainability benefits this product offers by protecting the health of consumers, Citystem™ is developed from Sederma's eco-designed HTN™ plant cell culture process. This intrinsically sustainable manufacturing technology requires only a very small amount of the plant, removing the need for over exploitation of land, or transportation of crops to our factories and reducing the greenhouse gas emissions associated with the production of the ingredient.



Our health care excipients improve the efficacy of pharmaceutical actives

## Raw materials and the supply chain

Transparency within our supply chains is of key importance to us. All of our suppliers must go through an approval process where we check their quality systems and performance. We completed our initial work with Sedex (Supplier Ethical Data Exchange), which involved asking 200 of our suppliers, based on their geographical location and raw material origin, to register with Sedex and complete their questionnaire. We have analysed results from suppliers and started to risk assess them developing a process flow diagram to help us take action where necessary. In 2018 our Corporate Ethics Committee will continue to engage with, and assess, suppliers in countries where there is higher risk of modern slave labour.

## Sustainable palm oil

We have made continued progress in driving industry transformation to RSPO (Roundtable on Sustainable Palm Oil) certified physical supply chains. Highlights include:

- 76% of consumer businesses' products containing palm oil converted to RSPO certified
- Over 5,000 customer product combinations of Certified Sustainable Palm Oil (CSPO) derivatives available, covering all geographical regions and all nine industry sectors
- 60% increase in CSPO sales volumes compared to 2016
- 99% of the volume of palm based raw materials coming into our manufacturing site at Rawcliffe Bridge, UK, is RSPO Supply Chain Certified (SCC)
- We have participated in over 30 industry presentations, panel debates and media interviews on the issues around sustainable palm.

Globally, our 12 RSPO SCC manufacturing sites have continued to increase volumes of certified raw materials. Although we have not met our 100% target, we are proud of our ambition and efforts in leading industry change, which has resulted in



Vice President Customer Alliances, Chris Sayner presenting on sustainable palm

thousands of certified products reaching our customers.

While the need to support sustainable palm does not have the same level of customer and industry awareness in all regions, for us this is a global concern and our efforts are consistent in all the regions in which we operate. This is exemplified by our RSPO SCC progress in Asia, Europe, North America and Latin America, where we continue working to overcome the different levels of awareness amongst customers. Also, whilst our 12 RSPO SCC manufacturing sites process 99% of the global palm derivatives we use, we will also be seeking certification of our Sederma subsidiary site in France and our Ditton site in the UK during 2018.

## Case studies

### Supply chain transparency for palm derivatives

**In 2015, the Consumer Goods Forum, a global industry network with membership comprising of 400 retailers and consumer goods manufacturers across 70 countries, issued Sustainable Palm Sourcing Guidelines.**

The recommendations in these guidelines include RSPO certification of supply chains and palm oil sourcing policies that seek transparency and support the production of deforestation-free sustainable palm oil. Importantly, consumer goods companies are encouraged to disclose time bound company policies, implementation plans, goals and progress that support deforestation-free and sustainable palm oil in their supply chains. Awareness in Europe is further enhanced by the Amsterdam Commitment, where governments of key European Union countries signed the Amsterdam Palm Oil Declaration, declaring their

# 2020

We are driving towards a fully sustainable, legal and deforestation-free sourcing by 2020

support of private sector-driven commitment to 100% sustainable sourcing and increased traceability of palm oil by no later than 2020.

We have further strengthened our commitment by working with a third party, independent organisation to confirm and verify transparency of our supply chains up to plantation for palm oil derivatives and mills/area for palm kernel derivatives. This work involves collecting data from major suppliers of palm and palm kernel oil derivatives, who supply 80% of the volume of palm derivatives we use. Once we have mapped out our supply chain in more detail using this data, a risk assessment of the sourcing areas and mills will be carried out.

This work could serve to identify potential field projects to be linked with key customers at the end of our supply chain. It has a clear roadmap through 2018 and will ultimately allow solutions to be found to improve practices along the whole supply chain.



We are working to increase transparency in our palm oil supply chain

# Making Ethylene Oxide Sustainable

Our ECO plant at our Atlas Point manufacturing site in Delaware, North America is our largest capital investment project. Here, we produce bio-based ethylene oxide (EO) from bio-ethanol, enabling the production of sustainable and bio-based lower carbon ethoxylates.

We have carried out ethoxylation at Atlas Point since the 1940s and it is the birthplace of many of our iconic surfactants and emulsifiers, such as Arlacel™, Atlox™, Brij™, Myrj™ and Tween™.

These are synonymous with ethoxylate chemistry and globally are the strongest brands. Our innovation and longevity in ethoxylation has led to the creation of new applications in many market sectors. We now have over 7,000 customer/product combinations, which we supply to 40 industries including, coatings, crop care, home care, lubricants, nutritional, personal care, pharmaceutical, veterinary and water treatment. Many of our products have provided solutions to application problems that previously had been difficult or impossible to solve. The wide functionality and efficiency of our range of ethoxylates means they are now firmly embedded within many high value supply chains.

The wide use of ethoxylates in many industries is well illustrated by our Personal Care sector, where 30-40% of skin and hair care products launched in the last 20 years globally contain such ingredients. Ethoxylates also represent major components in many other consumer products, such as those found in our Home Care sector.

Across all of these industries there is strong consumer demand to increase the bio-based renewable content of finished products, and there are many other industry sectors where reduced reliance on petroleum and increased use of renewable resources is desirable. However, up until now, petrochemical ethylene oxide (EO) has been a major obstacle.

## The new range of ECO surfactants:

- 100% renewable
- 100% bio-based
- Performance identical to petrochemical based options
- Lower carbon footprint than petrochemically derived ingredients
- USDA BioPreferred® Program third party certification\*
- RSPO Supply Chain Certified via Mass Balance

\* USDA BioPreferred is a registered trademark of the US Department of Agriculture

## Renewable energy at Atlas Point

In 2012, we invested US\$8 million in a renewable energy project at our Atlas Point manufacturing site, to install a pipeline from a local landfill site, so that we could use landfill gas to feed two Combined Heat and Power (CHP) units and a multifuel boiler to generate electricity and steam. In 2014, we invested a further US\$2.3 million in solar panels at the site, which reduced our annual CO<sub>2</sub> emissions by 11,600 tonnes. These projects combined generate more than 60% of the site's energy.

By the end of 2018, a further CHP unit will be installed, increasing our capacity for generating electricity and steam from landfill gas.



Our landfill gas pipeline

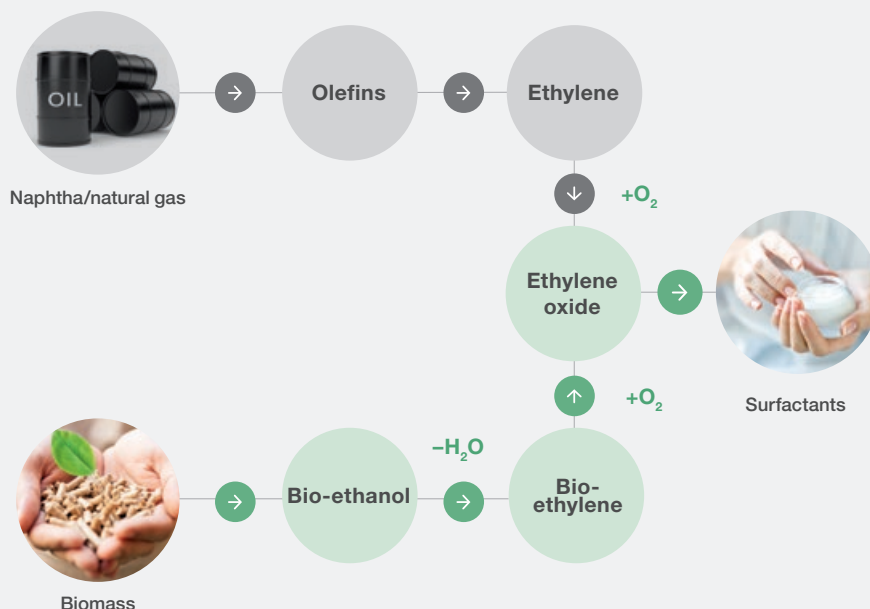
## Avoidance of GHG emissions

Capturing and burning landfill gas avoids the release of methane into the atmosphere, which has a global warming potential 25 times greater than CO<sub>2</sub>, when measured over 100 years. Our use of landfill gas since 2012, combined with the reduction in our usage of natural gas, has led to an aggregate reduction in GHG emissions of close to 1 million tonnes CO<sub>2</sub>e. Annually, the amount of avoided emissions is a figure equivalent to our total combined Group scope 1 and 2 emissions.



The ECO plant

## Bio-ethanol – natural route to ethylene oxide



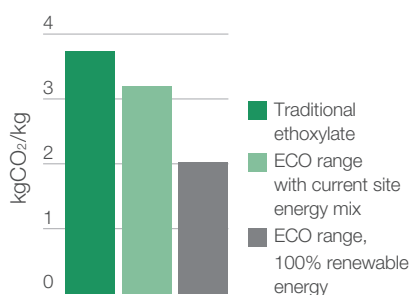
### Carbon footprint of ECO range

We have used SimaPro software to model the cradle-to-gate LCA of our ECO product families, focusing on the climate change impact category, following the technical specification ISO 14067.

The high proportion of renewable energy available at Atlas Point, along with the use of bio-EO, leads to a significant reduction in carbon footprint for a typical ECO product family, when compared to traditional ethoxylates made using petrochemical based EO and without renewable energy.

There is also the potential to allocate the available renewable energy that we use at the Atlas Point site to specific ECO products. If a typical ECO product family was made using 100% renewable energy we would see a further reduction in the carbon footprint.

### Carbon footprint of ECO products compared with traditional ethoxylates



Director of Operations, Robert Stewart, thanking all construction workers for 800,000 hours worked without an injury

### Safety at ECO

Process safety principles have been applied to the ECO plant from its conception through to its commissioning and operation. We examined all the scenarios that could lead to plant failure, and have taken steps to prevent occurrence through risk reduction and elimination at the process design stage. We selected a process flowsheet from Scientific Design, a specialist company whose EO process design has registered millions of hours of incident-free operating time at many locations around the world.

Our detailed process design was subjected to rigorous hazard studies to identify and eliminate problems before the plant was built. Furthermore, we applied comprehensive commissioning, operational safety and post-start up checks across the whole plant, ensuring safe operation.

During construction, our contractors worked a combined 800,000 hours without injury, a commendable record for a project of this scale. This has been achieved through attention to detail and careful work by hundreds of workers, and through

detailed checks, audits, planning and supervision. We are proud of the safety record of our contractors.

### Community benefit

Our investment in the new ECO plant to produce bio-based EO at our Atlas Point manufacturing site is the largest single project in our 92 year history. The contribution of the plant to the community is significant, both nationally and more locally in the State of Delaware.

# 250

new construction jobs in Delaware and 30 new full time employees to run the ECO plant

The risks associated with transporting highly flammable petrochemical EO from the Gulf of Mexico by rail to our Atlas Point manufacturing site cease once the ECO plant is fully operational in early 2018, therefore removing a major safety risk to the community along this long rail corridor.

Locally, our Atlas Point facility has always been a supportive corporate citizen and active member of the community. Over the last two years, this expansion has brought over 250 construction jobs to Delaware and we have added 30 new full time employees from the region to the workforce to run the ECO plant.

We held a ribbon cutting ceremony to commemorate the commissioning of the plant in October 2017, which was attended by our Executive Committee members including Group Chief Executive, Steve Foots, and Delaware State Governor, John Carney who said:



Innovative companies like Croda continue to help drive Delaware's economy, and we welcome this expansion and continued investment in our state. This investment is further evidence that Delaware remains a competitive place to do business, grow a company and create good-paying jobs."

**John Carney**  
State Governor



Construction workers on site at the ECO plant

# Drift Reduction Technology

Our unique wind tunnel facility in North America enables us to work with customers to develop new 'low drift' crop protection products to control the spraying of crops

## Investing in...

### Technology

Following three years of intensive development, the measurement and high speed imaging capabilities in our bespoke wind tunnel allow us to characterise spray patterns down to the movement of individual droplets. This provides the tool kit with which to conduct in-depth research on spray droplet size control and drift reduction mechanisms.

### Niche

Our testing capability enables us to assess agricultural spray quality and find control solutions that better meet customer, market and environmental needs. This improves spray delivery to the target, which minimises waste and reduces the impact on animals, plants, water and land.

### Smart Partnering

We developed the wind tunnel in collaboration with academic and industry partners around the world including, agricultural, mechanical and aerodynamic engineers. The facility offers a unique range of support to our customers who engage us on projects to improve spray performance.

### People

Through relationships formed in the design and delivery of this facility, our people continue to expand their technical knowledge, links to outside experts, depth of understanding on market needs and insight to the challenges in meeting them. This enables us to help our customers focus on developing technologies that solve the right problems and better manage risks.

# Planet and Process

Minimising our impacts within our customers' supply chains

## Key Material Areas



### Environmental Impact

Minimise the impact of our operations



### Quality Assurance

Contribute to, and proactively seek, higher quality standards across product and operational aspects of our Business to ensure consumer safety



### Process Safety

Keeping our manufacturing sites safe and legally compliant

Our manufacturing processes take raw materials and intermediates from our suppliers and we subject them to chemical and physical processes that require resources such as energy, air and water. We strive to minimise the resources and minimise the waste generated with every kilogram of product we make. We then pack our products in recyclable packaging, and where possible aim to manufacture the products as close as possible to our customers to minimise the energy required for transportation.

We measure the impacts of our resource consumption and waste generation, and have set targets to reduce these impacts.

The impacts of our operations are not just environmental. We are acutely aware of the hazards presented by

some of the processes we operate. In addition to maintaining full compliance with the law in every country where we operate, we have our own Process Safety Framework that we apply to our sites, and we invest in maintaining sufficient internal capability to do this. Keeping our plants safe is part of our licence to operate.

Avoiding the transportation of flammable raw materials over thousands of miles from the southern USA is a major benefit of our new ECO process, recently established at our Atlas Point manufacturing site in North America (p16). This removes the risks associated with transportation of hazardous materials as well as saving energy for transportation and its associated greenhouse gas (GHG) emissions.

## Highlights

15.9%

reduction in total waste sent to landfill since 2015 versus our target of 10% by 2020

4.4%

reduction in water usage since 2015 versus our target of 10% by 2020

A-

rating by CDP for our Climate Change report

14.9%

reduction in scope 1 and 2<sup>1</sup> greenhouse gas emissions intensity since 2015 versus our target of 10% by 2020

## GHG Emissions

Since 2015, our baseline year, total emissions have fallen by 0.6% even as our Business has expanded and new capacity has been commissioned. Within this, scope 1 emissions have increased by 3.1%, whilst scope 2 emissions have fallen by 7.4%.

### GHG emissions (TeCO<sub>2</sub>e)<sup>1</sup>

2017	134,562	66,432
2016	128,550	67,350
2015	130,492	71,727

■ Scope 1 ■ Scope 2

Our chosen measure of GHG emission intensity divides our GHG emissions by value added<sup>2</sup>: a measure of our business activity. Since 2015, our GHG emissions intensity has fallen by 14.9%, illustrating how our Business has grown without a negative impact on GHG emissions intensity.

### GHG emissions intensity (TeCO<sub>2</sub>e/£m)

2017	347
2016	356
2015	408

All of our GHG emissions data is verified by Carbon Smart. Their formal Independent Verification Statement is available at [www.croda.com/carbonverification](http://www.croda.com/carbonverification)

<sup>1</sup> Scope 1 emissions are calculated using the International Energy Agency's published conversion factors for the tonne equivalents of CO<sub>2</sub>. Scope 2 emissions are location based

<sup>2</sup> Value added is defined as operating profit before depreciation and employee costs at 2015 constant currency

## Reducing our net impact on the environment

Our business activities may have several different impacts on the earth's ecosystems. We are constantly striving to eliminate or minimise negative impacts made up and down the supply chains of which we are a part. This means maximising our use of sustainable raw materials and working with our suppliers to reduce their environmental impact. It also means designing our products to have a minimal impact at the end of their life cycle and to offer effects to our customers and their consumers that are beneficial to the environment.

## Environmental impact of our manufacturing sites

The overall impact of our Business is greatly influenced by the performance of our manufacturing sites. In 2016, following successful achievement of environmental targets between 2010 and 2015, we established five year targets against a 2015 baseline for the reduction of our environmental impacts to land, water and the atmosphere, including climate change induced by greenhouse gas (GHG) emissions. In 2017, we continued to make progress on reducing the environmental impact of our operations against these targets.

## Energy and GHG emissions targets

Our overall energy use has increased by 3.7% since 2015 due to our continuing expansion, which includes the commissioning of significant new plant capacities in Asia, Europe and North America. However, when this is expressed relative to the increasing activity of our Business, as energy intensity (energy consumption divided by value added\*), we have achieved a 11.3% reduction since 2015.

Despite these significant extensions to manufacturing capacity, the increased output has been achieved at the same time as a 0.6% reduction in our scope 1 and 2 GHG emissions. In 2018, we have set a new target for reduction of our scope 1 and 2 GHG emissions intensity of 10% by 2020, compared to 2015 levels, which will be challenging due to ongoing plant expansions. GHG emissions intensity also uses value added\* as the denominator.

## Expanding while minimising environmental cost

In addition to our programme of continuing investment in energy efficiency improvements, we have actively chosen to

build many of our expansion projects in locations that have access to low carbon energy sources. For example, at our Chocques manufacturing site in France where the electricity supply is of largely non-fossil origin and the steam supply is from a local municipal waste processing plant. Expansion at our Atlas Point manufacturing site in North America, benefits from our US\$8 million investment in generation of heat and electricity from landfill gas.

## CDP rating for climate change

We have been reporting our performance on GHG emissions to CDP (formerly known as the Carbon Disclosure Project) since its inception, and we have made good progress on reducing our GHG emissions, and improving in the scope and accuracy of our measurements.

Our work in reducing GHG emissions has been recognised by a score of A- in CDP's 2017 climate change rankings, our highest rating so far. Our scope 1, 2 and 3 carbon emissions have again successfully been verified by independent agency, Carbon Smart.

\* Value added is defined as operating profit before depreciation and employee costs at 2015 constant currency

## Case studies

### Energy efficient processes

**Our Process Innovation Team is focused on the delivery of innovative, differentiating technologies and processes for manufacturing our products, offering energy and capital savings as well as reducing waste.**

One of the most recent successes is the application of a novel continuous reactor to replace a batch stirred reactor at one of our UK manufacturing sites. The continuous reactor occupies 80% less floor space than a traditional reactor, and has a lower capital cost and operating expense.

Pilot trials have shown that the novel technology can lead to a significant reduction in energy usage, as the reaction progresses much more quickly. This will result in a reduction in our scope 1 and 2 GHG emissions. Therefore, the products we make with this reactor will have a much lower product carbon footprint, offering us a competitive advantage alongside the

environmental benefits. The success of the pilot trials will lead to investment in a full scale plant. This project offers us huge value and is just one of several that the team is currently investigating. Other areas of focus are the development of enhanced separation techniques to reduce processing costs, and increase the purity and quality of our final products.

80%

The continuous reactor has an 80% smaller floor footprint than a traditional reactor

### Hybrid model for scope 3 reporting

**In 2017, we embarked on a project to increase the accuracy of our scope 3 emissions reporting, focusing on the 'Purchased Goods and Services' category, as this provides the largest contribution to our overall scope 3 emissions.**

In previous years, we have used our total raw material spend multiplied by a Department for Environment, Food and Rural Affairs (DEFRA) factor to give us total scope 3 emissions associated with our raw materials. However, this does not give any consideration to the details of our supply chains and the processes involved before we receive our raw materials. Working with Carbon Smart, engaging suppliers and using literature data, we have developed product carbon footprints for four of our largest raw material streams:

- rapeseed oil
- fish oil
- wool grease
- ethylene oxide

## CDP Climate Change progress

	Rating	Diligence
2010	not rated*	not rated*
2011	E	58
2012	D	72
2013	B	93
2014	B	92
2015	B	96
2016	B	not rated**
2017	A-	not rated**

\* First submission in 2010 not rated

\*\* Numeric ratings for scoring diligence discontinued from 2016

## Scope 3 GHG emissions

The scope 3 emissions associated with our purchased raw materials have been calculated in more detail than ever before using our new Hybrid model (p20).

Further examples of our scope 3 savings projects include:

- Our investment in video conferencing equipment worldwide to increase networking and communication efficiency has resulted in the avoidance of significant GHG emissions through a reduction in air travel

→ Our strategic aim is to locate production close to customer whenever the opportunity arises. We have relocated several product lines recently and have significantly cut the GHG emissions arising from transportation to our customers

→ Our continued support for sustainable palm oil, which has also contributed to a reduction in scope 3 GHG emissions. (p15).

In late 2017, we held a Carbon Summit, attended by all of our business functions and business leaders with the aim of developing our decarbonisation strategy. This included prioritising our work on life cycle assessments and to agree an approach to calculating the benefit in use of our products, specifically in terms of the reduction of GHG emissions. The Summit identified several areas for further development to build on our environmentally sound business fundamentals:

1. To recognise the fact that around two-thirds of our raw materials remove carbon dioxide, the most common GHG, from the atmosphere by photosynthesis and to include this in our overall assessment of Croda's impact on the environment

2. To establish consistent measurements of the beneficial contributions that our products make to the environmental performance of our customers' products
3. To develop a means of internal carbon costing to influence our decisions about product development and investment in low carbon supply chains
4. To increase our understanding of the GHG emissions of our suppliers and contractors by asking them to report through the CDP
5. To examine ways of rendering parts of our business carbon neutral through beneficial carbon offsetting schemes.

Work has already begun on these five themes, please see pages 12, 14 and 22 for more details.

## COP21: The Paris Agreement

We are committed to the principles set out in the UN Paris Agreement on Climate Change and are optimising our approach to demonstrating our commitment. Our intention is to have targets that encompass all of the impacts of our Business, including our selection of raw materials and the carbon saving benefits in use of our

## Case studies

For a given tonnage of raw material purchased we can now calculate the associated scope 3 GHG emissions using these newly developed product impact tools.

This provides our purchasing teams with much more information regarding the impact of certain factors in the supply chain of our raw materials and, by making the effect of our emissions apparent, could help inform decisions regarding different suppliers. The data gathered will also be used in the development of our end product carbon footprints, giving our customers more accurate information regarding the scope 3 emissions of their services.

Our intention is to continue to improve the accuracy of how we determine our scope 3 emissions calculations by assessing more of our larger raw material streams each year.

## Gouda green energy

Our Gouda manufacturing site in the Netherlands won the Dutch Chemical Industry Association (VNCI) Responsible Care Award for our innovative new glycerine fermentation project. This project, Project Quarterback, was supported by the EU through its 'LIFE' environmental project funding programme. ([www.quarterback4life.nl](http://www.quarterback4life.nl))

We were nominated for our glycerine fermentation project, which formally opened on 1 June 2017. This investment has seen the site reduce GHG emissions by around 25%, due to the partial replacement of natural gas fuel with bio-gas, created from crude glycerine or 'sweetwater', a by-product of the major processes on the site. The project generates up to 2MW of electrical power through an efficient Combined Heat and Power (CHP) system.



Creating bio-gas from crude glycerine

This prestigious award is presented every year by the VNCI for inspiring and innovative projects within the Dutch chemical industry. Nominated projects must demonstrate substantial improvement on safety, health, environment or sustainable performances within the core values of the VNCI Responsible Care programme.

product ranges. By the end of 2018, we aspire to set longer term decarbonisation targets that are consistent with the Paris Agreement.

### Further decarbonisation investments

In addition to expanding our solar panel arrays, we are making further investments in CHP units, including an expansion in 2018 to the landfill gas CHP generator at our Atlas Point manufacturing site in North America. We are also evaluating options for further investment in photovoltaic solar panels at several sites.

### Longer term process development

For the longer term, we are carefully examining opportunities to reduce our manufacturing carbon footprint by replacing selected chemical process steps with biochemical alternatives. In 2017, we acquired Enza Biotech, an innovative Swedish company that has developed technology for the manufacture of surfactants using carbohydrate-based chemistry, and we are now actively researching several other biotechnological supply chain options.

### ECO plant using bio-based ethylene oxide

At the end of 2017, we commissioned the new ECO plant at our Atlas Point manufacturing site in North America. This represents our largest construction project ever undertaken and transforms a significant part of our product supply chain into being sourced entirely from renewable raw materials. The new ECO plant produces ethylene oxide, a very important raw material for us, using biologically derived ethanol, or 'bio-ethanol' (p16).

### Reducing environmental impacts

In 2017, our total water consumption was 4.4% lower than the baseline year of 2015. We remain on track to achieve our target of 10% reduction by 2020.

Two manufacturing sites have contributed significantly to this achievement, both of which are in water stressed regions: Thane, India has recorded a 24% reduction in total water usage since 2015; and our Mevisa manufacturing site in Spain has reduced its water usage by 13.8% compared to 2016. We were also awarded a rating of B by CDP in 2017 for our performance on water reporting and conservation, maintaining the strong position we had in 2016.

Our focus on reducing waste to landfill has continued relentlessly and we have now decreased our annual figure by 15.9% since 2015, against a target reduction of 10%. The best performer in 2017 was our Mevisa manufacturing site, which has contributed a reduction of 26% in 2017 compared to their 2016 figure.

Volatile Organic Compound (VOC) emissions for the Group are small and the type that we emit, typically solvents such as ethanol, have little or no known global warming potential. However, we continue to measure them to minimise losses to the environment through our sewers and to the atmosphere. We calculate our losses on a site mass balance basis and assume that any missing quantities have been lost to the environment, which is the most stringent method. Our total losses to sewer and to atmosphere in 2017 were within 1% of our 2015 emissions, despite greatly increased production activity on the relevant production assets.

4.4%

In 2017, our total water consumption was 4.4% lower than the baseline year of 2015

## Case studies

### Carbon offsetting

As well as working hard to reduce emissions from our manufacturing sites by investing in sourcing lower carbon energy and developing more energy efficient processes, we are currently investigating several opportunities for offsetting unavoidable carbon emissions through investment in projects that are relevant to our Business and supply chain.

In 2017, we started working with ClimateCare to declare the manufacturing processes of our Personal Care (PC) Beauty Actives business climate neutral by offsetting the associated manufacturing scope 1 and 2 GHG emissions.

By purchasing these offsets we are helping to support the Rimba Raya Project in Kalimantan, Indonesia; a biodiversity reserve with a 30 year lifetime that is protecting a large area of tropical rainforest from deforestation, which had been previously lined up for conversion to palm oil estates. This land use conversion would not only



PC Beauty Actives business manufacturing processes now climate neutral

have released the carbon stored in the biomass above ground, but also the draining of the peatland would have released vast below ground carbon stores. The project area is also home to more than 90 endangered species, including the Bornean Orangutan. Revenue generated through carbon credits is being used to create viable community based employment alternatives to deforestation. There are also other social development benefits, such as the distribution of clean water filters, establishing community libraries to support literacy skills and education in environmental conservation.

This is our first carbon offsetting project and, whilst we are currently offsetting a relatively small proportion of our emissions, this project has helped to show what can be done and provided scope for further offsets across other parts of our Business, complementary to our internal carbon reduction projects and community investment activities.

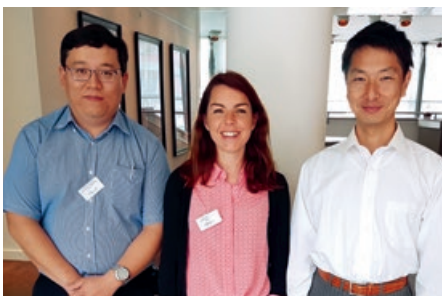


Rimba Raya funded community nursery

## Process safety

Process Safety forms the basis of our licence to operate and is a Material Area in its own right. We regard a major lapse in Process Safety as one of our top 10 business risks. Our 19 manufacturing sites operate over 200 processes and our philosophy is that if any of these processes has the potential to cause a fatality, then we must be able to show that the risk has sustainably been reduced to a safe level.

We aim to maintain sufficient capacity in-house to do Process Risk Reviews (PRR) for all our processes once every five years. Each PRR is subject to an assessment of its quality against rigorous internal standards, and we are on track to meet our target of having all our processes assured by the end of 2018. Once this first round of PRR checks has been done, we will embark on a 'Stage 2' assessment of our higher hazard processes to an even more rigorous standard, which we are arranging to be done by peer review. At the beginning of 2017, we completed a special review of our Alkoxylation processes worldwide using Quantitative Risk Analysis techniques. The exercise identified opportunities for improvement and has ultimately reassured us that we can demonstrate that our highest hazard processes are safe.



Recent Hazard Study Leaders Academy graduates, Frederico Kobayashi, Isabel Fernandez and Koji Agata

Our Hazard Study Leaders Academy brings together our process engineers each year to ensure commonality of purpose and technique. The academy's syllabus is recognised by a UK university, and in 2017 a further five engineers embarked on the course and three graduated from their second year with a postgraduate certificate.

## Quality assurance

Globally, our manufacturing sites now have a robust and comprehensive quality management system in place. This is aligned with our customers' needs and includes the adoption of EFfCI and EXCiPACT GMP standards for cosmetic ingredients and pharmaceutical excipients respectively. We are making good progress

in ensuring that our recently acquired sites and larger non-manufacturing sites have implemented their own quality management systems in accordance with ISO 9001: 2015 requirements. The next step is to integrate the site based systems across the whole of our operations to form an overall quality management system. Integration will facilitate knowledge sharing and accelerated improvements, leading to a reduction in the risk of quality incidents. Our quality managers are being developed with the advanced skills required to support this integration.

As a complementary theme, and utilising the plan-do-check-act approach that is embedded in our quality systems, we will now focus systematically on improvements in efficiency, and especially in common processes across the globe. Not only will this improve performance and minimise waste, but it will also bring greater harmonisation, thereby enhancing our customers' experience.

## EFfCI

Our manufacturing sites have adopted EFfCI and EXCiPACT GMP standards

## Case studies

### Solar array installation at Thane

**To reduce GHG emissions and our reliance on fossil fuels, our manufacturing site at Thane in India has commissioned a 70kW photo-voltaic power plant, which is expected to generate approximately 80,000kWh of electricity each year.**

The solar cells use the latest technology, with a conversion efficiency 21% higher than the previous generation and an effective life of 25 years.

This improved conversion efficiency enables the cells to continue to generate electricity even in limited light conditions. It also helps to minimise the footprint of the solar array and enabled expansion capability to be built into the project, since additional cells may be located on the same roof terrace. Future generation capacity

may be increased up to 100kW and enable electricity to be exported into the grid during periods of low demand on site.

The investment at Thane is our third major investment made in solar arrays at our sites and forms part of our long term commitment to reduce GHG emissions. In 2011, our offices at Edison, North America, became the first location in the company to commission a solar array and has been able to generate 50% of its power demand from the 350kW capacity installation. The second 777kW array was installed in 2013 at our Atlas Point manufacturing site in North America. Although the array at Thane was only commissioned in quarter four 2017, the CO<sub>2</sub> emissions avoided by the generation of our own renewable solar electricity across the three installations in 2017 was the equivalent of taking 86 cars off the road for a year.



Rooftop solar array at Thane

# Marine Environment Sustainability

The global marine transport industry needs lubricants that meet stringent legislation requirements, so that vessels can enter any waters in the world



## Investing in...

### Niche

Regulations demand that the lubricants used in a marine environment have minimal damage to aquatic life to protect our oceans. These regulations are regional, but can have global implications. For example, the United States Environment Protection Agency Vessel General Permit (VGP) applies to ships entering USA territorial waters, but ship owners and operators need the flexibility to send any ship into USA waters at any time.

### Technology

We have a long history of producing lubricant base oils that are readily biodegradable, do not bio-accumulate in the environment, have superior toxicity credentials and are based on renewable raw materials. They are designed with performance and the marine environment in mind, providing optimum performance in ship power transmission and positioning systems, whilst meeting the requirements of all major international Ecolabelling schemes.

### People

Our research and development team work alongside our global product safety and regulatory experts to ensure that we offer the right solution to our customers. This is fundamental in enabling our customers to operate without limitation in any waters across the world, as they can be called upon to deliver products anywhere at short notice, making it an absolute requirement that our products are designed for global application.

### Smart Partnering

It is critical that we work in partnership across our entire supply chain to make sure that the lubricants we offer meet the highest performance and environmental requirements of our customers' products. This in turn must satisfy the needs of the equipment they are used in, both above and below the waterline. Through ongoing industry and customer collaborations, we gain an early understanding of these demands, so that together we can respond quickly to new performance and regulatory requirements to protect our oceans.

# People and Community

Ensuring the success and safety of our people and supporting the communities in which we operate

## Key Material Areas



**Occupational Health & Safety**  
Empower employees to have health and safety at the forefront of their thinking



**Our People**  
Create an environment where people can thrive



**Diversity & Inclusion**  
Embrace and empower all individuals



**Knowledge Management**  
Safeguard our knowledge and expertise



**Community Education & Involvement**  
Support the communities in which we operate, with a primary focus on encouraging young people to work within science and technology

People underpin everything we do and are the focus of our Business.

Our family culture, can-do attitude, entrepreneurial spirit and talented people set us apart from our peers. Investing in our people ensures that everyone can fulfil their potential; whilst creating an inclusive environment means that everyone can achieve their best.

The health and safety of our employees is paramount and we are increasingly focusing on the physical and mental welfare of our employees.

We are proud of our people's personal and professional achievements, both within the Croda family and in the wider world, as they represent us in industry and through volunteering work in our local communities.

People remain the focus of five out of 10 of our Material Areas, which ensures that where it is important to do so, we go beyond the human rights, anti-corruption and anti-bribery matters required by law.

In 2017 we demonstrated our commitment to health and safety by rolling out a behavioural safety training programme recognising that behaviour is at least as important as the process. Also in 2017, we completed our Global Employee Culture Survey (p26), we developed a series of actions to increase the number of women in senior roles and we also began implementing a new global Human Resources (HR) system. These significant investments will continue in 2018 where we will focus on the results of the survey and continue to implement our diversity actions.

## Highlights

107,000+

training hours were recorded by 82.7% of employees

Living Wage

employer in the UK, accredited by the Living Wage Foundation

Global

Behavioural Safety Training Programme implemented

50.0%

of 1% Club time was spent on educational initiatives

## Diversity and Inclusion

We embrace the differences of a multi-ethnic, multi-geographic and multi-skillset company

### Across the Group

67.1% (2,890) male  
2016: 67.5%

32.9% (1,419) female  
2016: 32.5%

### Regional and Business Board Members and Senior Functional Heads

83.8% (88) male  
2016: 81.6%

16.2% (17) female  
2016: 18.4%

### Executive Committee Members

88.9% (8) male  
2016: 90.0%

11.1% (1) female  
2016: 10.0%

### Board of Directors

75.0% (6) male  
2016: 75.0%

25.0% (2) female  
2016: 25.0%

We continue to comply with the ILO Declaration on Fundamental Principles and Rights at Work. Key policies can be found at [www.croda.com/companypolicy](http://www.croda.com/companypolicy)

# Global Employee Culture Survey

Since being introduced in 2004, the Croda Vision has become an important part of describing our company, our people and the values, behaviours and attitudes we expect of ourselves.

These values, behaviours and attitudes are often referred to as our culture. The culture is not only described through the Croda Vision, but also in a written paper approved by the Executive Committee and Board in 2016 that set out, in detail, what it means to work at Croda.

## The Croda Vision

- To remain an independent company and operate as one global team
- We will remain a 'fun', lively, stimulating and exciting place to work, where all employees have the courage to question, and all functions and individuals are valued
- There will be a place for many styles of leadership, but all leaders will have as their primary objective to build other leaders
- We can only achieve our goals through excellent and constant communication, creativity and setting clear objectives at every level
- We will continually improve
- We will continue to be an ethical and responsible company.



Our People

## Foundation of the survey

To understand if the Croda Vision was experienced across our global organisation, we launched a Global Employee Culture Survey, the first for over 10 years. The survey was designed internally to test the elements of our culture that are important to us and that we believe set us apart from our peers. The survey was divided into four sections. Three directly relating to our culture as described in the 2016 paper; 'Who we are', 'How we work together' and 'How we manage our work'. The fourth section contained additional general employee engagement questions.

### Who we are

- Loyalty and commitment
- Trust
- Pride
- Family and community.

### How we work together

- Openness and transparency
- Fairness and equality
- Responsibility and recognition.

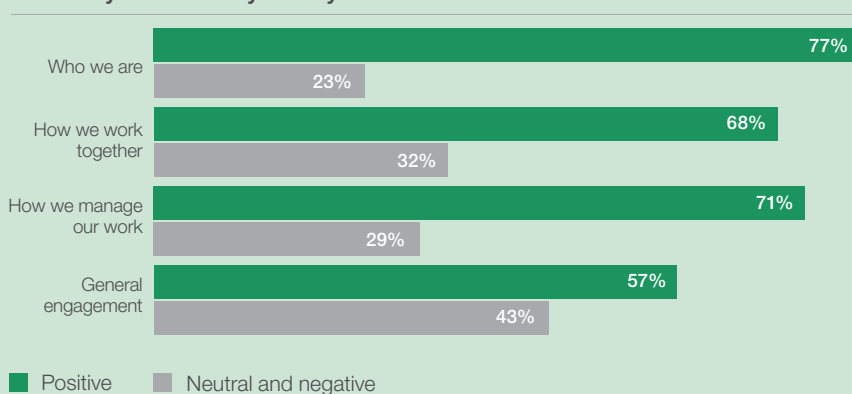
### How we manage our work

- Agility
- Creativity and innovation
- Fun
- Informal.

## The response

The results of the survey have been encouraging, with positive scores in excess of 65% for the questions relating to our culture; indeed some of the questions in these sections achieved positive scores in excess of 80%. For the general engagement questions responses were on average over 50% positive, a little behind the culture results.

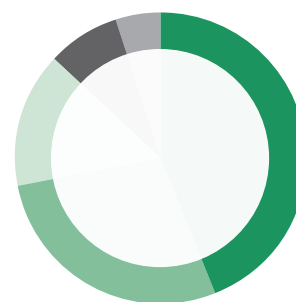
## Summary of results by survey section



## Pleasing completion

The survey was distributed to 31 countries and translated into 15 languages. In all, 3,386 employees completed the survey either online or on paper over a three week period ending in September 2017. We were delighted with an overall global response rate of 80%. However, there were some regional variations to the response rate ranging from 72% to over 90%; reflecting the size and complexity of some regions.

## Response breakdown by region



Western Europe	44%
Asia	28%
North America	15%
Latin America	8%
Eastern Europe Middle East and Africa	5%

More specifically, employees rated their relationship with their immediate supervisor very positively and presented a good picture of teamwork across departments. Employees also shared that they have a good understanding of the purpose and goals of the organisation.

On a less positive note, employees said that the idea of a unified 'One Croda' culture isn't felt everywhere; they expressed concern that information and knowledge are not shared as widely as we would like and that communications about the business could be improved. There was also a call across the regions and across genders for more flexible working.

### What we are doing now and next

An interesting outcome of the survey has been the large amount of consistency in results across and between regions. However, we are mindful that, although concerns might be common across the Business, solutions to some of the issues may need to be more locally tailored.

## 2018

each location is being asked to deliver three actions in the year that make a positive difference to our culture

A great deal of work is now being undertaken to further analyse and review the survey results in every location and business unit, and heads of businesses and locations are in the process of sharing the results with employees locally.

Where more detailed feedback is required, listening groups are being established to provide in-depth commentary. Through this process, each location is being asked to identify and deliver three actions in 2018 that can make a positive difference to our culture. These actions, wherever possible, will be addressed by employees and

managers together and already in many places employees have volunteered to help with this work.

We also recognise, however, that some issues will need to be addressed on a global basis. Here work is beginning on these items particularly relating to the sharing of knowledge across the Business.

Updates and actions are being regularly shared with the Executive Committee and Board who have appointed Keith Layden as the board member with primary responsibility for ensuring that the survey results are considered and followed through. In addition, regular 'all employee' communications detailing the results and progress have been distributed.

One of the first findings to be actioned from the survey has been related to translation of communication material. Feedback from the human resource community was that the high response rate to the survey, especially in Asia and Latin America, was directly connected to the survey being translated. As a result, all global company announcements are now translated for local distribution.

The Global Employee Culture Survey has been meaningful and enlightening. We are committed to following through on the actions and also repeating the survey in two years to accurately measure our progress towards our cultural aspirations.

## Key facts about the Global Employee Culture Survey

3

week survey phase  
in September 2017

60

questions divided into  
four categories

15

survey  
languages

3,386

employees completed  
the survey

Improved response rate over other recent  
regional employee surveys

31

countries across the  
world took part

80%

employee  
completion rate

75

feedback reports completed  
and counting

Results reported by  
market sector, region, country  
and location

### Our people goals support the business strategy:

- Continually improve personal health and safety across all of our operations with an aspirational goal of zero injuries
- Protect and nurture the Croda culture, to ensure it is retained as a source of competitive advantage
- Provide meaningful career development and training to enable everyone to fulfil their potential
- Attract talented individuals that bring knowledge and experience and enrich our culture
- Increase diversity and create an inclusive environment so that every person has opportunities to progress and to give their best
- Ensure the retention of skills and knowledge within the business to protect and grow our pipeline of innovation and technology enhancements
- Develop and maintain positive relationships with the communities that we operate in, being both an ambassador for the chemical industry and a good citizen.

### Developing a strong safety culture

The safety of everyone who works at or is associated with our operations is of paramount importance to us. In 2017 we were pleased to see a 5% reduction in our Total Recordable Injury Rate from 0.77 in 2016 to 0.73. With occupational safety a focus of significant activity our Leadership Development training has now been delivered at all of our manufacturing sites, supporting first line managers to develop the leadership competence to manage safety behaviour consistently. The programme has been externally recognised by an IChemE award in Singapore and a shortlisting for the IChemE's global awards.

In 2017, we also rolled out our global Behavioural Based Safety (BBS) observation system. It includes a nine step process determining safety critical behaviours in key job roles; training in structured observation techniques; and feedback to team members on trends and emerging areas for improvement.

## Leadership

Development Training wins Singapore IChemE award for Training and Development

### Investing in our people so we attract, develop and retain talent

We believe that our culture and the development of our people sets us apart from our peers and we have continued to progress relevant activities in this area, including carrying out our first Global Employee Culture Survey in 2017 (p26). Through our global Aspire performance management system, we can be confident that in 2017 92% of employees received a formal appraisal, including a development and career discussions.

Our global HR systems are not integrated and many use old fashioned technologies. So in 2017 we approved a significant investment to bring our core HR, talent, performance management, learning, recruitment and on-boarding systems together into one specialist HR system.

Last year we also identified a gap in our suite of development programmes at the senior leader level, which resulted in the launch of a new leadership programme called LEAD. This aims to improve leadership effectiveness through increasing self-awareness and understanding of being a leader in the modern business world. The nine month programme, which was first introduced in the Asia Pacific region where a rapidly growing market and the variety of business cultural styles add to the

### Case studies

#### Acting on our responsibilities to the local communities in which we operate

A major focus of our Community Education and Involvement work is through our award winning 1% Club. This programme encourages employees to spend 1% of their work time supporting the wider societies we are part of and in 2017 we had a recorded 5,073 hours. Here are some key employee achievements from 2017.

#### Supporting STEM

2017 saw our people invest 2,536 hours in Science, Technology, Engineering and Maths (STEM) activities, supporting our business objective of developing the scientists of tomorrow; talent we depend upon for the future of our Business. Within this, a group of children from a primary school close to our global headquarters at Cowick Hall in the UK came to the site for a 'Dragons Den' style STEM session. Here, the pupils aged 9-10 and 10-11 presented their bubble bath formulations and marketing plans to a judging panel of Cowick based experts. These had been developed following a Croda STEM ambassador visit to their school where a session called 'Fun with Foam' had been run. This had inspired them to use the knowledge gained to create their bubble bath formulations.

#### Supporting National Volunteer Week in the Netherlands

Employees from Croda Gouda in the Netherlands organised a number of activities, from a musical and high tea event for residents of a care home in Alphen aan den Rijn, to cleaning an outside space at a nursery school close to the manufacturing site. Members of the site management team also volunteered to clear and renovate a local primary schoolyard.



Tidying outside space for a local nursery school



We are proud to be accredited by the Living Wage Foundation as a Living Wage Employer in the UK, and we continue to ensure that our people around the world receive a fair and reasonable wage for the country in which they reside

complexity of leadership, uses residential, group coaching and a business project facilitated by using both internal and external training providers.

As we continue to refine our talent management processes, in 2017 we increased our focus on creating and implementing individual training and development plans, along with updating the succession plans of our senior roles.

Our graduate recruitment programme continues to be a successful source of new talent, as we now hire graduates in a range of disciplines across the world. We are pleased to report that our retention of graduates is also better than the industry average, as we ensure that we offer our graduates fulfilling careers once they have left the graduate training scheme.

## Committed to an inclusive environment

Providing a truly inclusive work environment is fundamental to ensuring that everyone can give and achieve their best in a global business. Following feedback from our Global Employee Culture Survey, all of our groupwide announcements are now translated into 15 languages. In January 2017, we also launched a diversity calendar to raise awareness of significant events happening across all of our global locations.

However, along with many of our industry peers, women are under represented in senior positions, so improving this situation is a primary objective. Our Executive Committee have therefore agreed a set of actions to help us meet this goal, including: establishing networking and mentoring opportunities; providing leadership training specifically designed for women; and rolling out unconscious bias training, starting at the most senior levels.

We are also carrying out the required analysis in accordance with the new Gender Pay Gap reporting regulations. We will publish the outcomes in line with the statutory timescales and review our diversity plans in light of the findings. With regards to flexible working, although many locations already support elements of this, our Global Employee Culture Survey has given us feedback that we need to go

further. Therefore, all hiring managers will be asked to consider what elements of flexible working can be included for advertised roles.

## Retaining the knowledge that we work hard to develop

Innovation is a key strategic pillar for us and central to this is the retention of knowledge and the technologies that give us an edge. In support of this objective we are actively identifying career paths that provide development, not only in traditional leadership roles, but also for technical and scientific specialists to ensure that we offer them fulfilling career opportunities.

Moving into 2018, as part of our strategy to integrate knowledge retention tools and techniques within our leadership portfolio, we will include a specific module on the subject in our Management Capability programme. Another priority is to ensure that the security of information and knowledge is maintained, which is why we are committed to achieving zero breaches of information from our IT systems. Work is also underway to ensure that we will be prepared for the EU GDPR legislative environment in May 2018, as well as making sure that on an ongoing basis every protection is provided to our current systems.

## Case studies

### Latin America in action

In Latin America, 2017 saw employees from Croda Brazil's Friendship Club visit Associação de Pais e Amigos dos Excepcionais (APAE), a local organisation that provides social assistance to people with disabilities. Meanwhile, Croda Argentina used their 1% Club time to donate food, clothes and other household goods to the Si Foundation in Buenos Aires.

50.0%

of 1% Club hours used to deliver STEM activities

### Supporting the community in China

Colleagues at Croda SIPO used their 1% Club time to visit an older member of their community who was struggling to live on his own. The team of 20 Croda employees helped him clean his house and surrounding land, also providing him with new bedding and kitchenware.



Croda SIPO employees helping their community

### Meals on Wheels in North America

Employees from our Edison site in New Jersey volunteered with the Meals on Wheels programme throughout 2017. Meals on Wheels is a national organisation that supports community based senior nutrition initiatives. Employees delivered hot meals door-to-door in the greater Edison area.



Volunteers go into the community to deliver meals

## Key Relationships

# Collaboration and partnership

Our success is driven by a focus on collaboration, which we achieve by encouraging our people to think differently as they build intimate relationships throughout our Business, and work with our customers and peers.

### Customers

Our business model, directly delivering thousands of products to thousands of customers without third party distribution, requires an unrivalled level of customer engagement and intimacy on a global scale. Each of our market sectors has a dedicated research, sales and marketing team who are constantly in close collaboration with a number of departments within customers' organisations. These touch points include: research and development, marketing, production, purchasing, quality, regulatory and sustainability. This level of engagement and intimacy creates true partnerships based on trust and reliability.

### Our people

Our extensive product portfolio is supplied to many diverse markets, creating a high degree of complexity, but also competitive advantage and great opportunities. Our people's intuitive ability to manage this complexity comes from a culture that promotes continuous internal communication and sharing of information and best practice across all disciplines. This internal communication is both structured and informal, which creates opportunities for cross fertilisation of ideas and innovation.

→ Read more on page 25

### Open innovation partnerships

Innovation plays a critical role in the delivery of our strategy. Our global research and development teams across all our market sectors build collaborative partnerships with world leading academics and universities to innovate and develop unique ingredients that add value to our customers' products and address their consumers' unmet needs.

### Smart partnerships

Through collaborative partnerships with university start-ups and technology specialists, we identify opportunities to create next generation solutions. By combining and investing in technologies from external sources, together with our in-house expertise, they identify solutions which match our customers' future needs across all our market sectors. In 2017 we acquired Enza Biotech in Sweden and IonPhaseE in Finland, and we invested in Cutitronics, based in the UK, all of which have novel patented technology.

### Supply chain partnerships

Managing our global customer product matrix requires strong partnerships with suppliers and a high degree of transparency, operating on a global, regional and local level. Raw material quality and supply, together with assured supply chain integrity, are pre-requisites to operating responsibly. Connections in supply chains are now stronger than ever before, and product integrity relies on upstream transparency in supply chains to ensure that we source from suppliers with shared values and standards equal to our own.

→ Read more on page 15

### Investor base

We communicate regularly with our existing and potential shareholders to ensure that our strategy and trading trends are clearly and consistently understood. Recognising the importance of direct communication, in 2017 we attended numerous investor conferences and roadshows in the UK, USA, Europe and Asia and regularly co-ordinated investor site visits, capturing and discussing shareholders' opinions and key issues.

### Our collaboration in 2017 included:

33,986

meetings with our customers

39

managers completing our annual 2020 Network development programme

100+

projects working with 393 partners

3

smart partnership investments

2,000+

face-to-face meetings with raw material suppliers

38

investor conferences and roadshows attended

## Management and Governance

# Delivering sustainability

All of our employees play a part in delivering our sustainability programme, and at every one of our locations it is line managers who provide the leadership necessary to ensure progress, led by a dedicated senior management team.

### Delivering sustainability, at every level of our Business

Our two most senior committees, the Board of Directors and Group Executive Committee, are ultimately responsible for our economic, environmental and social performance. They maintain an active role in ensuring that sustainability remains an integral element of our business strategy.

Our Vice President (VP) of Sustainability, who reports to our Group Chief Executive and President of Operations, manages our Global Sustainability Team. With the support of an Executive Sponsor, he also chairs our Global Sustainability Steering Committee, which is composed of functional experts and regional representatives. The role of the Steering Committee is to develop our Sustainability Strategy in response to global mega trends (p02) and to communicate progress made on the various components of our sustainability programme, as well as providing guidance to line managers on sustainability matters.

### Reporting progress

We have 66 reporting operations covering the whole Group, each with a Sustainability Champion who reports progress against our targets and a set of key performance indicators (KPIs). Along with details from our Material Area Owners, this information is communicated to the Group Executive Committee on a quarterly basis. The Board of Directors also receives quarterly summary reports, along with bespoke presentations on key sustainability topics throughout the year, as it is an integral part of their agenda.

### Strategic review

In place of our annual sustainability conference, in July 2017 we held a review of the available Corporate Social Responsibility (CSR) governance standards, ultimately selecting ISO 26000 as the framework for our sustainability activities. In November we held a Carbon Summit, the output of which has helped us to prioritise and direct our approach to decarbonising our Business. This not only incorporates our own activities, but also those upstream in the supply chains of our suppliers, and downstream in the supply chains of our customers and their consumers.

### Applying ISO 26000

Following our Sustainability Steering Committee review of the available CSR governance standards, which included the UN Global Compact, ISO 26000, and the OECD CSR guidelines, we concluded that the ISO 26000 guidance would be best suited to our business needs. We then comprehensively assessed alignment with this guidance in order to identify strengths and weaknesses in our approach to sustainability. This was done both internally and externally with Bureau Veritas and, having done this, in early 2018 we plan to prioritise any opportunities arising from these assessments.

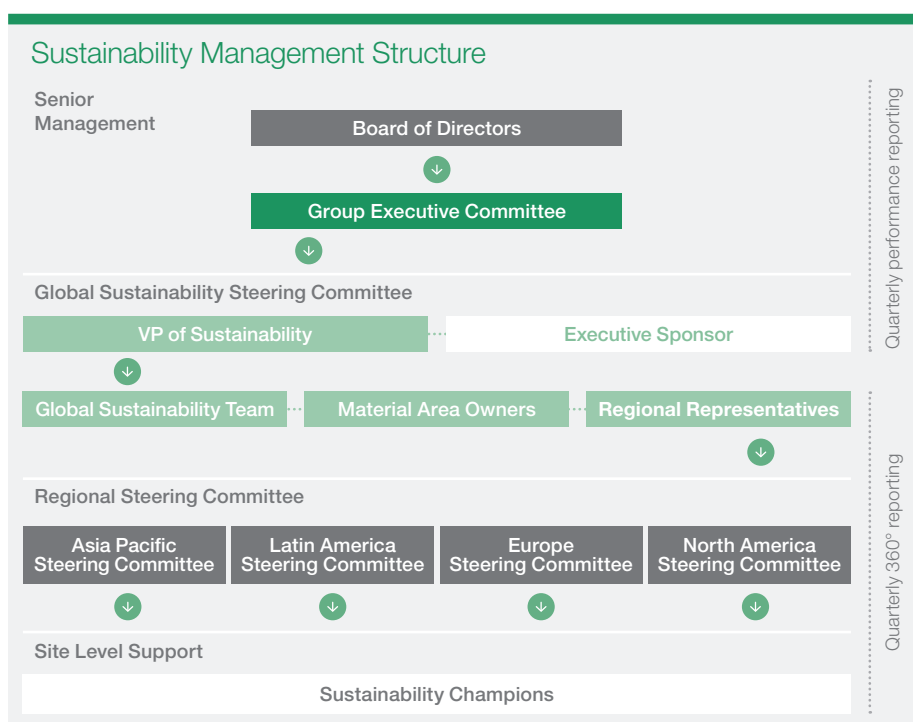
### 2017 reporting parameters

This report covers the sustainability performance of Croda International Plc for the period 1 January 2017 to 31 December 2017. The scope of this report is all wholly owned operations, plus those operations where we have significant management influence due to a majority shareholding. Unless otherwise stated, the data provided throughout this report is for continuing operations.

In July 2017 we acquired Enza Biotech, a research enterprise established as a spin-out company from Lund University in Sweden; and in December 2017 we acquired IonPhasE, an innovative technology supplier of static electricity protection products headquartered in Tampere, Finland. Sustainability data from these acquisitions are not within the scope of this year's report.

During July 2017 we also bought a minority shareholding in Cutitronics, whose patented handheld device has ultimately been designed to improve skin health. Due to the nature of this partnership their activities are not within the scope of our sustainability programme.

→ We have responded to GRI since 2008, all reports including that for 2017 can be downloaded at [www.croda.com/GRI](http://www.croda.com/GRI)













# Material Area Performance Summary

## 2017 performance

● Met ⊗ Not met ● Coming early 2018 ● Ongoing ○ New

Target	Maturity	Status	2017 Progress Summary
<b>Governance</b>			
Implement agreed actions from the third party review of our alignment with ISO 26000 Corporate Social Responsibility guidelines	2018	○	In 2017 we adopted the ISO 26000 Corporate Social Responsibility guidance, in order to implement our social responsibility strategy. A review of strengths and weaknesses was carried out by Bureau Veritas in 2017 and actions from this review will be prioritised and addressed throughout 2018. <b>p31</b>
<b>Environmental Impact</b>			
Reduce total Group energy intensity by 5% from 2015 baseline	2020	●	We are ahead of target to achieve our five year energy intensity reduction plan. This is calculated by dividing energy consumption by value added (operating profit before depreciation and employee costs). By the end of 2017 we had achieved a 11.3% reduction compared to 2015. <b>p20</b>
Generate 27% of the Group's total energy requirements from non-fossil fuel sources	2020	●	We are making good progress against this target and in 2017 24.1% of our energy was taken from non-fossil sources. We have achieved this increase by actively sourcing lower carbon electricity, working with our energy suppliers to ensure we are receiving greener tariffs. Our manufacturing site in Gouda, the Netherlands, purchases guarantees of origin for 100% renewable electricity supply. <b>p20</b>
Reduce total Group VOC emissions by 10% from 2015 baseline	2020	●	Although our Group volatile organic compound (VOC) emissions are small, we still monitor progress against this stretching reduction target. Despite increased production volumes, in 2017 our VOC emissions were within 1% of our 2015 emissions. Reduction strategies are in place at the relevant production assets. <b>p22</b>
Reduce total Group water withdrawal by 10% from 2015 baseline	2020	●	We remain on track to achieve this target with our total water consumption in 2017 being 4.4% lower than the baseline year of 2015. Two manufacturing sites have contributed significantly to these reductions, both of which are in water stressed regions: Thane, India and our Mevisa site in Spain. <b>p22</b>
Reduce Group waste to landfill by 10% from 2015 baseline	2020	●	We are currently ahead of target as waste to landfill decreased by 15.9% between 2015 and 2017. This was due to major reductions at our Mill Hall manufacturing site in North America and Mevisa manufacturing site in Spain. Eight of our manufacturing sites sent zero waste to landfill. <b>p22</b>
Reduce total Group scope 1 and 2 GHG emission intensity by 10% from 2015 baseline	2020	○	We are currently already ahead of this new 2020 target with a 14.9% reduction in GHG emission intensity in 2017 compared with 2015. However, when our ECO bio-ethylene oxide (EO) plant comes online in 2018, our Group scope 1 and 2 emissions will increase, because in producing our own ethylene oxide, we are reducing carbon emissions elsewhere in our supply chain and taking on a greater burden ourselves. However, even with the inclusion of our ECO plant, other carbon reduction projects taking place across the group mean we anticipate meeting this target. <b>p20</b>
<b>Process Safety</b>			
Ensure that all Process Risk Reviews (PRR) are compliant with our internal quality targets	2018	●	Good progress is being made towards this target, with additional effort being directed towards completing this priority activity in 2018. <b>p23</b>
Conduct an independent review of our Process Risk Reviews (PRR) for high hazard processes	2020	●	We are on track to complete this target by 2020. We are currently implementing further improvements highlighted during quantified risk assessments of our highest hazard category of processes, whilst we focus on completing the remaining peer reviews. <b>p23</b>

Target	Maturity	Status	2017 Progress Summary
 <b>Occupational Health &amp; Safety</b>			
Implement a Behavioural Safety Observation System across all manufacturing sites	2017		We have completed this target with a Behavioural Safety Observation System successfully implemented across all sites. Ongoing evolutionary improvements will be introduced as the programme matures. <b>p28</b>
Achieve a sustained OSHA Recordable (TRIR) injury rate in the top quartile of chemical manufacturing companies with more than 1,000 employees	2020		We are on track to reach our 2020 Total Recordable Injury Rate (TRIR) target of 0.6. During 2017, we have seen a 5% reduction in our TRIR, from 0.77 at the end of 2016 to 0.73 at the end of 2017. <b>p28</b>
Implement a programme of Interaction Management training for line managers to enable clear communications with employees about safe behaviours	2017		This target has now been completed, with an Interaction Management training programme implemented at all sites. However, there will be some additional sessions for previously absent employees at one location, which will take place in 2018. <b>p28</b>
Top management, regional leadership teams, business leadership teams and all operations management shall conduct regular behavioural safety observations	2018		This is a new target developed as an outcome of the Behavioural Safety Observation System maturity scorecard, which was introduced in 2017, and has identified areas for ongoing refinements by sites. <b>p28</b>
 <b>Product Stewardship</b>			
Assess the social and environmental practices of our highest risk suppliers	2017		Work has been completed for our first 200 suppliers. In 2018, we will build on the learnings from this work, continuing to analyse our results and take action where necessary. Working with recognised consultants, we will continue to engage with and assess suppliers in countries where there is a higher risk of modern slave labour. <b>p15</b>
Develop and implement a standardised process for identification and management of upstream supply chain risks	2018		This new target involves the development of a process whereby high risk suppliers are risk assessed using a third party consultant. We will train regional procurement champions to work closely with our suppliers and these consultants. Where suppliers do not comply we will look to deselect the supplier or approve alternative suppliers. A trial of the process will begin with selected suppliers in 2018. <b>p15</b>
Only supply RSPO certified palm oil ingredients subject to the feasibility of the supply chain	2017		<p>Although we have not met our 100% target we are proud of our ambition and efforts in leading industry change we now have thousands of customer/product combinations available and 76% of our product codes have changed to RSPO certified in our consumer businesses. Globally our 12 manufacturing sites that are RSPO Supply Chain Certified (SCC) to handle sustainable palm oil based raw materials have continued to increase volumes of RSPO certified raw materials.</p> <p>The need to support sustainable palm does not have the same level of customer and industry awareness in all regions. For us this is a global concern and our efforts are consistent in all the regions in which we operate, as exemplified by our RSPO Supply Chain Certification in Asia, Europe, North America and Latin America. We continue working to overcome the different levels of awareness amongst customers both in our consumer business and other industries. <b>p15</b></p>
Only supply RSPO certified palm oil ingredients subject to the feasibility of the supply chain	2018		We will continue to work towards a target of supplying 100% RSPO certified ingredients to customers across all of our businesses. By lengthening the maturity date of this target, we will report against further progress next year. <b>p15</b>

● Met 
 ⊗ Not met 
 ● Coming early 2018 
 ⊙ Ongoing 
 ○ New

Target	Maturity	Status	2017 Progress Summary
Implement a system that will facilitate the traceability of palm derived raw materials	2017	●	This target has now been met. All palm derived raw materials are identified in our SAP system and we are engaged in direct discussions with suppliers representing 80% of our purchased volumes. Working with an independent third party organisation, this target has further progressed with a new, zero deforestation palm oil supply chain target. <b>p15</b>
Work with a third party independent organisation to increase traceability of our palm derived raw materials ensuring progression towards zero deforestation in our palm oil supply chains	2020	○	This new target is aligned with that adopted by the Consumer Goods Forum within their palm oil sourcing guidelines, together with the Amsterdam Declaration (7 December 2015). We are working with an independent third party organisation to confirm and verify transparency of our supply chains up to plantation for palm oil derivatives and mills/area for palm kernel derivatives. This work will ultimately allow solutions to be found to improve practices along every step of the supply chain, heading towards fully sustainable, legal and deforestation-free sourcing by 2020. <b>p15</b>
Profile the greenhouse gas emissions of our top 30 suppliers, using the CDP supply chain methodology	2018	○	This new target will allow us to increase the accuracy of our Scope 3 GHG emissions reporting through greater supplier engagement. Using CDP supply chain methodology, we will ask our suppliers to calculate a percentage of their emissions that are associated with the products we purchase from them based on tonnage.






### Product Design

Characterise and quantify the sustainability benefits to our customers of our most important product application types	2018	○	To achieve this new target, we will focus on several industry important application areas and quantify the carbon savings our customers make through the use of our products. For example, calculating the avoided emissions associated with the increased fuel efficiency provided by the use of our lubricants in vehicles. <b>p14</b>
Develop an ingredient sustainability database for key product families, to facilitate efficient information sharing with our customers	2018	○	The aim of this new target is to generate a more in depth database that will enable our sales representatives to provide customers with instant information on the sustainability credentials of some of our key product families, building the infrastructure to allow us to expand on this in the future.
Using life cycle assessment techniques, characterise the relevant environmental and social impacts of key product families	2018	⊙	We are making good progress against this target. With the appointment of specialist resource in this area, we have developed in-house capability to conduct the Life cycle assessments of our products. We have measured the carbon footprint of key ECO product families, and following our internal Carbon Summit event, further products will be evaluated in business priority. <b>p12</b>



### Quality Assurance

Ensure that designated larger sales and distribution sites attain ISO 9001: 2015 standards, and that smaller locations are able to share the quality systems and expertise of neighbouring accredited sites	2018	○	This is a new target, following on from the good progress made in ensuring that our recently acquired sites and larger non-manufacturing sites in the Group have implemented their own quality management systems in accordance with ISO 9001 requirements. The next steps will be to integrate these site based systems across the whole of our operations. <b>p23</b>
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Target	Maturity	Status	2017 Progress Summary
 <b>Our People</b>			
Conduct regular global employee engagement surveys, with the first taking place in 2016	2016	●	We completed our Global Employee Culture Survey in September 2017, and have identified a new target to respond to the results. <b>p26</b>
Address agreed actions from the 2017 Global Employee Culture Survey	2018	○	This is a new target, following on from completion of our Global Employee Culture Survey where data reports by country, region, market sector and location are in the process of being produced and distributed. Employee meetings are being held to share the results of the survey and action plans to address issues are in the process of being defined. In early 2018 we will be working on a scorecard to summarise and track these actions. <b>p26</b>
Ensure that all employees have a formal annual appraisal	2017	⊗	While we have not met the target of 100%, we continue to make good progress in this area with 92% of employees completing their appraisal in 2017. <b>p28</b>
Ensure that all employees have a formal annual appraisal	2018	○	In this new target we are continuing to monitor appraisal completion rate and have pushed back our target maturity date by a year. Working with line managers, we hope to improve on last year's completion rate. <b>p28</b>
 <b>Knowledge Management</b>			
Develop a suite of best practice processes and training to enable better retention of knowledge within the Business	2017	●	We have achieved this target in 2017, having modules in the area of knowledge retention in our Management Essentials Training Programme, and also our new Specialists Development Programme that will be rolled out in 2018. <b>p29</b>
Implement a Management Capability Programme to increase the capability of every manager within our Business in the areas of developing and retaining talent, knowledge sharing and maximising business performance	2018	◎	We are making good progress against this target. In 2016 we designed and implemented manager training in the area of developing and retaining talent, which is now being rolled out globally. Knowledge sharing and maximising business performance are included in our Management Essentials Programme and our Specialist Development Programme. <b>p28</b>
 <b>Diversity &amp; Inclusion</b>			
Implement the agreed actions to increase the number of women in leadership positions	2018	○	The agreed actions associated with this new target relate to flexible working, unconscious bias training, establishing mentoring programmes and providing networking opportunities for women internally and externally. <b>p29</b>

# Sustainability in the textile supply chain

The processing of textile materials requires many different products in conjunction with the consumption of significant amounts of water and energy

## Investing in...

### Niche

Global retailers are now scrutinising water and energy usage within their supply chain and are demanding reductions from their textile processors.

### Technology

Our technology focuses on optimising enzyme activity, enabling processing temperatures to be reduced by up to 20-25°C, whilst eliminating the need for harsher chemicals to be used in manufacturing and also reducing the number of processing stages. Combined, these benefits reduce water and energy usage, and decrease discharge into waste water, consequently reducing the environmental impact of water treatment.

### Smart Partnering

We collaborate with our customers to ensure that the ingredients we develop will meet their performance needs, whilst satisfying consumers' increasing sustainability demands. Further down the supply chain, this has already seen our inclusion on the approved supplier lists for national retailers.

### People

Such complex products and processing techniques require our research and development teams, and also our sales people to have a high degree of technical knowledge. We ensure that these teams are continually learning about the latest advancements in the textile industry through the results of our own internal technical trials and market presentations.

# Report abbreviations

<b>£m</b>	Million pounds sterling	<b>KPI</b>	Key performance indicator
<b>%</b>	Percent	<b>LCA</b>	Life Cycle Assessment
<b>°C</b>	Degrees Celsius	<b>ISO</b>	International Organisation for Standardisation
<b>US\$</b>	United States Dollar	<b>LTI</b>	Lost time injury
<b>®</b>	Registered Trademark	<b>m<sup>3</sup></b>	Cubic metre
<b>APAE</b>	Associação de Pais e Amigos dos Excepcionais	<b>MW</b>	Megawatt
<b>BBS</b>	Behavioural Based Safety	<b>NPP</b>	New and Protected Products
<b>bio-EO</b>	Bio-ethylene oxide	<b>O<sub>2</sub></b>	Oxygen
<b>CDP</b>	Formerly 'Carbon Disclosure Project'	<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>CEO</b>	Chief Executive Officer	<b>OSHA</b>	Occupational Health and Safety Administration
<b>CHP</b>	Combined Heat and Power	<b>OHSAS</b>	Occupational Health and Safety Assessment Series
<b>CO<sub>2</sub></b>	Carbon Dioxide	<b>P</b>	Page
<b>CO<sub>2</sub>e</b>	Carbon Dioxide Equivalent	<b>PChi</b>	Personal Care and Home Care Ingredients
<b>COP21</b>	United Nations Paris Climate Change Conference in 2015	<b>Plc</b>	Public Limited Company
<b>CSPO</b>	Certified Sustainable Palm Oil	<b>PSRA</b>	Product Safety and Regulatory Affairs
<b>CSR</b>	Corporate Social Responsibility	<b>PRR</b>	Process Risk Review
<b>DEFRA</b>	Department for Environment, Food and Rural Affairs	<b>R&amp;D</b>	Research and Development
<b>ECHA</b>	European Chemicals Agency	<b>RSPO</b>	Roundtable on Sustainable Palm Oil
<b>ECO Range</b>	Environmentally Conscious Option Range of bio-based products	<b>REACH</b>	Registration, Evaluation, Authorisation and Restriction of Chemicals
<b>EEMEA</b>	Eastern Europe, Middle East and Africa	<b>SAICM</b>	Strategic approach to international chemicals management
<b>EFfCI</b>	European Federation for Cosmetic Ingredients	<b>SDG</b>	Sustainable Development Goals
<b>EO</b>	Ethylene oxide	<b>SCC</b>	Supply Chain Certified
<b>EU</b>	European Union	<b>Sedex</b>	Supplier Ethical Data Exchange
<b>EXCiPACT</b>	Certification scheme for pharmaceutical excipient suppliers	<b>SPO</b>	Sustainable Palm Oil
<b>FSC</b>	Forest Stewardship Council	<b>STEM</b>	Science, Technology, Engineering and Mathematics
<b>FTSE4 Good</b>	A series of ethical investment stock market indices	<b>Te</b>	Tonne
<b>GDPR</b>	General Data Protection Regulation	<b>the Principles</b>	12 Principles of Green Chemistry
<b>GHG</b>	Greenhouse gas	<b>TM</b>	Trademark
<b>GJ</b>	Gigajoule	<b>tpa</b>	Tonnes per annum
<b>GMP</b>	Good Manufacturing Practice	<b>TRIR</b>	Total recordable injury rate
<b>GR</b>	Genetic Resources	<b>UK</b>	United Kingdom
<b>GRI</b>	Global Reporting Initiative	<b>UN</b>	United Nations
<b>H<sub>2</sub>O</b>	Water	<b>USA</b>	United States of America
<b>HR</b>	Human Resources	<b>VOC</b>	Volatile Organic Compound
<b>HTN</b>	High Tech Nature	<b>VNCI</b>	The Association of the Dutch Chemical Industry
<b>ICChemE</b>	Institution of Chemical Engineers	<b>VP</b>	Vice President
<b>ILO</b>	International Labour Organisation		
<b>kg</b>	Kilogram		
<b>kW</b>	Kilowatt		

## Cautionary Statement

The information in this publication is believed to be accurate at the date of its publication and is given in good faith but no representation or warranty as to its completeness or accuracy is made. Suggestions in this publication are merely opinions. Some statements and in particular forward-looking statements, by their nature, involve risks and uncertainties because they relate to events and depend on circumstances that will or may occur in the future and actual results may differ from those expressed in such statements as they depend on a variety of factors outside the control of Croda International Plc. No part of this publication should be treated as an invitation or inducement to invest in the shares of Croda International Plc and should not be relied upon when making investment decisions.

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**CONRAN DESIGN GROUP**

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