



2014 – 2015

# Cristal Sustainability Update



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**Cover Photo:** Wind farm at Cristal Paraíba mine in Brazil is the main source of power supply to our mining operations. The farm is constructed on rehabilitated mining area.

**General Note:** This document provides an update to the 2013 Cristal Sustainability Report presented on our website, where a full overview of our reporting against GRI G4 guidelines is provided. The reporting methodology used in this initial report is in accordance with the GRI G4 “Core” guidelines.

The reporting period for this report is calendar years 2014/2015. This is the latest data available as of the preparation of this document. Only sections with updated data for the above-mentioned years are included in this report. Other sections are referred to in the initial report.

**Note:** For the reporting period of calendar years 2014 and 2015, information relating to indicators in sections 5, 6, 7, 9 and 10 were only available for our TiO<sub>2</sub> manufacturing sites. These locations represent over 90% of our economic value generation.

Thank you for your interest in our sustainability performance.

Please send questions or comments to [sustainability@crystal.com](mailto:sustainability@crystal.com).

## WELCOME FROM OUR EVP

Dear Readers,

At Cristal, we recognize that sustainability is not just a word. We understand the environmental, social and economic foundations of sustainability and we continue to work hard to ensure that sustainability is a value that is integrated in our corporate culture. In our health, safety and environmental policy we commit to resource conservation, community service and HSE excellence. We are also committed to continually improve our HSE management systems.

We are closely working with our stakeholders; including manufacturing associations and customers; to develop tangible initiatives to monitor, manage and improve our sustainability performance on the environmental, social and economic fronts.

To achieve our sustainability goals, we formed our sustainability team that involves manufacturing, environmental, research and innovation, marketing, supply chain, human resources and corporate communication disciplines under one umbrella. We have also set measurable sustainability indicators for each of our sites that is monitored monthly and discussed through global monthly meetings to follow up progress.

We recognize that energy remains a significant contributor in transportation, manufacturing and handling our raw materials and products. The downturn in global economy in 2015 has resulted in a slight increase in our energy consumption per ton of product due to lower production volumes. However, we will continue to drive energy improvements through energy reduction programs and seeking for alternative renewable energy sources for our manufacturing facilities.

We continue to actively participate with the local communities in each of our operating areas to improve the quality of life of the people who trust us to work in their areas. We are sharing some examples of community support in this report.

By continuing our sustainability efforts we are confident that we shall enhance our position as one of the leading titanium value chain suppliers globally and provide a real added value to our stakeholders. We are committed to continue collaboration with our stakeholders worldwide on developing our long-term sustainability strategy.



Dr. Christian Günther  
Executive Vice President  
Titanium Strategic Business Unit  
Cristal  
A Tasnee Company

# 1 ORGANIZATION

Cristal is one of the largest producers of titanium dioxide and a leading producer of titanium chemicals. We are the largest merchant titanium chemicals producer and the world's leading supplier of ultrafine titanium dioxide products and titanium chemicals. We are a fast-growing producer of mineral sands and titanium metal powder.

After reorganization in 2016, the number of our employees worldwide is nearly 3,400. Our total sales were approximately \$1.75 bn.

After acquiring Jiangxi Tikon Titanium Company in China in 2015, we now operate eight titanium dioxide manufacturing plants in seven countries and on five continents.

In 2014, Tasnee acquired more shares in Cristal which increased its share to 79%. These shares were acquired from the Gulf Investment Corporation who now owns 20% of the shares. A private investor holds 1% of the shares.

Following the acquisition of additional Cristal shares, Tasnee conducted a reorganization of its owned companies including Cristal. Under the new organization, the manufacturing activities are operated under three strategic business units (SBU) for petrochemicals, downstream industries and titanium. Cristal is operating under the Titanium SBU. This report is providing information on Cristal sustainability. In the future, we plan to provide an integrated sustainability report for all Tasnee SBUs including Cristal.





## 2 THIS REPORT

The reporting period for this document is calendar years 2014-2015. The first report was issued in 2015 for the calendar year 2013 according to GRI standard's "Core" option. Cristal is planning to update the sustainability report on a yearly basis in alignment with the Tasnee sustainability policy.

This report includes only updated information for the years 2014-2015. Detailed content on sustainability is provided in the initial report which can be accessed through our website via the following link:

[http://www.cristal.com/news-room/Documents/Sustainability\\_Report\\_Interactive.pdf](http://www.cristal.com/news-room/Documents/Sustainability_Report_Interactive.pdf)

The contact person for questions regarding this report, or feedback and suggestions for our sustainability program is Chris Wiernicki, General Manager - Health, Safety and Environment for Cristal, who can be reached at [sustainability@cristal.com](mailto:sustainability@cristal.com).

## 3 ECONOMIC PERFORMANCE

Economic impact of our operations includes direct payroll and benefits; supplier spend, which is more than twice our direct payroll, and its impact on those companies; capital projects and construction force employment; the indirect multiplier effect of these expenditures upon the communities where we operate; tax payments and direct charitable donations to communities, and the economic benefit realized by our customers through their use of our products. We employ approximately 3,400 persons directly and over 500 full-time contractors. Net sales in 2015 were approximately \$1.75 billion.

Specific site information on employment including contractors, payroll, expenditures on supplies and construction, tax payments, and other information can be found at <http://www.cristal.com/about-us/Pages/site-locations.aspx>.

## 4 MARKET PRESENCE

The market presence comprises both local presence within communities where we have operations and industry presence in the international marketplace. Cristal's international market presence is managed as a growth objective with development plans proposed, reviewed and implemented through formal company funding processes. Success of initiatives is monitored through financial performance metrics, and adjustments are made as needed.

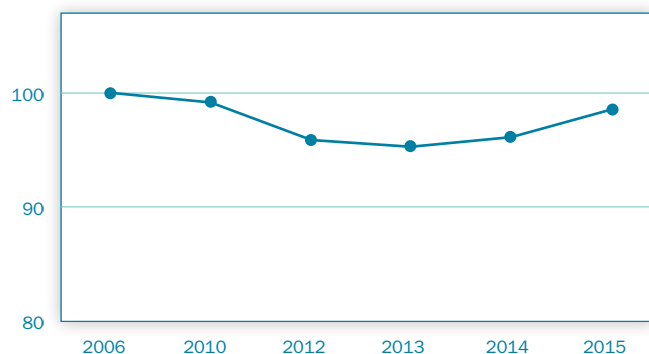
In 2014 and 2015, Cristal continued to be one of the largest producers of titanium dioxide products globally. Information about our presence in local markets is given in individual site fact sheets at <http://www.cristal.com/about-us/Pages/site-locations.aspx>.

## 5 MATERIALS

In 2014, we reduced our material use per tonne of our products by 4% compared to the 2006 baseline year. In 2015, due to lower production rates, our material use per tonne went back up to the 2010 level. Our manufacturing team is continuing to seek opportunities to further optimize the use of raw materials in our production plants and we expect further reduction in 2016. The overall yearly reduction through 2015 compared to the 2006 baseline is around 3%.

**Material Use Per Tonne of Product\***

2006 = 100



\*TiO<sub>2</sub> and co-products sold

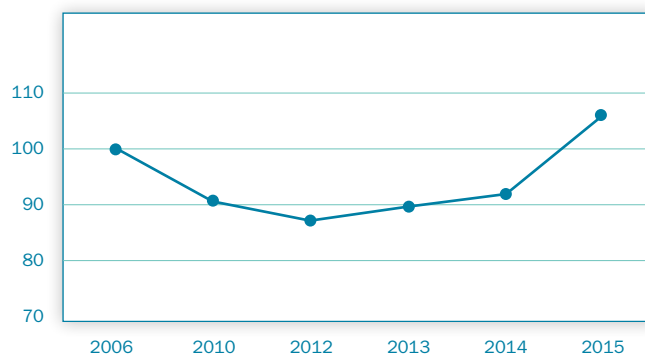
Reduction in material use trend over the past years.  
Low production rate affected 2015 performance

## 6 ENERGY

Energy efficiency programs resulted in a reduction of around 10% energy use through 2014 compared with the baseline year of 2006. In 2015, production volume was reduced in response to the global market conditions. This production volume reduction resulted in increased energy use per tonne of product in 2015 for all products by 5% compared to 2006. With increased production volume anticipated in 2016, we expect to again have a reduction in our energy use per tonne of all products. The overall yearly reduction through 2015 compared to the 2006 baseline is around 7%.

**Energy Use Per Tonne of Product\* – TiO<sub>2</sub> Plants**

2006 = 100



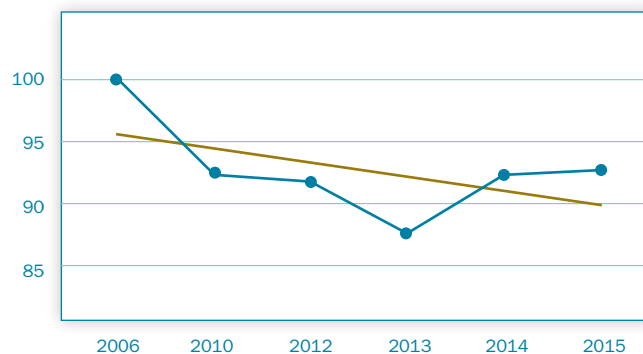
\*TiO<sub>2</sub> and co-products. Compared in GJ/t of products

Energy use reduction from 2006 to 2015. Low production affected energy use in 2015.

## 7 WATER CONSUMPTION

The overall reduction in water use is 7% from the baseline year. This was achieved through water efficiency programs at our sites. The reduction had reached 12% by 2013. In 2014 and 2015, there was an increase in water usage per tonne of product which is attributed mainly to lower production compared to 2013.

**Water Use Per Tonne of Product – TiO<sub>2</sub> Plants**  
2006 = 100



\*TiO<sub>2</sub> and co-products sold. Compared in m<sup>3</sup>/t of all products

Indicator of water consumption shows trend reduction in water use



Capturing rainwater for reuse in process plant at Broken Hill, Australia

## 8 BIODIVERSITY

In 2014 and 2015, we had over 300 hectares in rehabilitation in our Brazil and Australia mining sites, however much of this area will require several more years to fully achieve the agreed end uses. Much of this is in the process of recovery, but is not yet fully rehabilitated.



Rehabilitation at Ginko Mine, Australia

From 1988 to 2015, we planted 1,572,785 seedlings at our mine in Paráíba, Brazil. To date, we have planted 210 native species of the fauna in the mine rehabilitated areas. The mining area recovery program in Paráíba was recognized by the Brazilian Federal Environmental Agency (IBAMA) as one of the best environmental recovery works in Brazil.



Reforestation at Paráíba Mine, Brazil (after 15 years of rehabilitation)

	2014 (Ha)	2015 (Ha)
Total land disturbed and not yet rehabilitated: (A: opening balance)	1777	1862
Total amount of new land disturbed within the reporting period: (B)	189	155
Total amount of new land newly rehabilitated within the reporting period to the agreed end use (C)	104	208
Total land disturbed and not yet rehabilitated (D = A+B-C)	1862	1809

“ **Rehabilitation works at the Ginko mineral sands mine in south western New South Wales demonstrate the re-establishment of a semi-arid native vegetation ecosystem in an extremely challenging environment.**

**Native flora species cover once bare soil and many native lizards and birds have resettled in the area.**

**Successful rehabilitation works demonstrate an understanding of the delicate landscape, which requires innovative techniques to return it to a diverse and functioning ecosystem.”**

– Mineral Council of Australia, Feb. 2016.  
*Industry Report: Mine Rehabilitation in the Australian Mineral Industry* (p. 11-13)



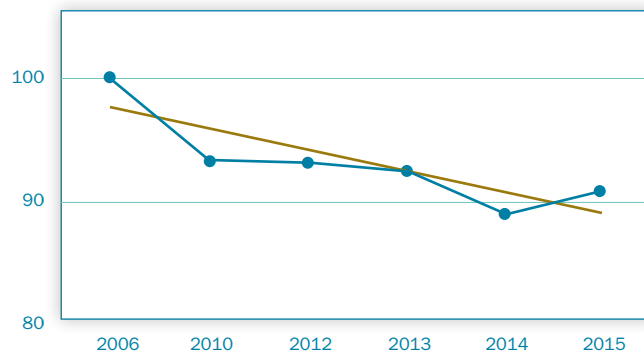
## 9 EMISSIONS

The graph below shows the carbon footprint reductions achieved by Cristal across the company from 2006 through 2015 expressed as the average kg of CO<sub>2</sub> produced for each kg of TiO<sub>2</sub> and co-products manufactured. In 2014, we reduced our carbon footprint by 11% compared to 2006 and by 3% compared to the previous year due to optimization programs across the different plants. In 2015, the carbon footprint slightly increased compared to the previous year, but we still reduced our carbon footprint by 9% compared to 2006. There are three main contributors to our carbon footprint: materials, energy and direct CO<sub>2</sub> emissions. We continued to improve materials usage and our direct CO<sub>2</sub> emissions; while we experienced an increase in our energy usage per tonne of product due to reduced production dictated by the downturn in the global market as explained in section 6. The overall reduction through 2015 compared to the 2006 baseline is over 8%.

Cristal is committed to reducing the carbon footprint of our business through improved manufacturing efficiency, waste reduction, improved emissions controls, alternative energy use and other methods that support all of the areas of sustainability.

**CF Per Tonne of Product – TiO<sub>2</sub> Plants**

2006 = 100



Indicator of carbon footprint shows trend reduction. Slight increase in 2015 compared to 2014 due to lower production.

# 10 EFFLUENT AND WASTE

In 2014, wastewater per tonne of product was reduced by 12% compared to 2006. In 2015, the quantity of wastewater discharged per tonne of products was increased due to low production volume, but there was still a reduction of 4% compared to 2006. In 2016, our plants developed initiatives for wastewater recycling in an effort to reduce water consumption and also wastewater discharged. The overall reduction through 2015 compared to the 2006 baseline is around 4%.

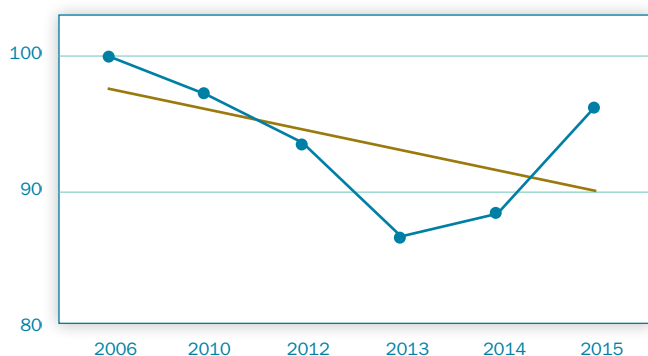
In 2014, process optimization resulted in significant reduction in the quantity of solid waste generated per tonne of product by around 6% compared to 2013 and 11% compared to 2006. The lower production volume and the limitations in ore selection adversely affected

the quantity of solid waste generated per ton of product in 2015. The overall yearly reduction through 2015 compared to the 2006 baseline is around 0%.

Cristal expects the trend of reducing solid waste to return in 2016 due to continued waste reduction efforts and increased production.

**Waste Water Per Tonne of Product – TiO<sub>2</sub> Plants**

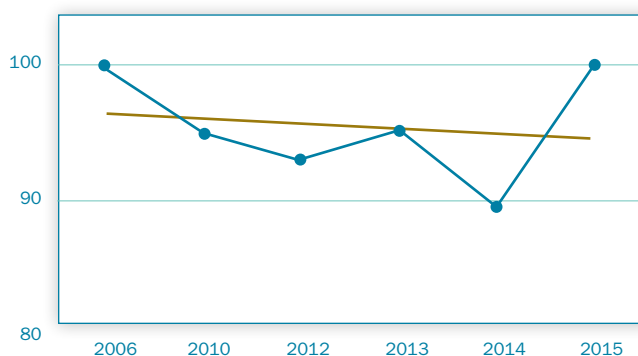
2006 = 100



\* TiO<sub>2</sub> and co-products sold. Compared in m<sup>3</sup>/t of all products

**Solid Waste Per Tonne of Product – TiO<sub>2</sub> Plants**

2006 = 100



\* TiO<sub>2</sub> and co-products sold. Compared in t/t

Waste reduction achieved through 2014. Low production affected 2015 performance.

## 11 ENVIRONMENTAL COMPLIANCE

Our manufacturing locations are subject to environmental permits, regulations and standards. Compliance is monitored by internal and external groups. Any non-compliances are investigated and corrective action plans are defined, implemented, tracked and validated as effective.

No significant fines or sanctions for non-compliance with environmental laws and regulations occurred in 2015. In 2014, our site in Yanbu, KSA was fined approximately US\$8,000 due to accidental discharge of white sediment to the Red Sea. The regulator accepted the company justification and the remedial action taken to clean up the area impacted. No further action was taken against the company.

## 12 EMPLOYMENT

Our workforce is the key to our success in all areas. Cristal is an effective and growing business – a leader in our field. What sets us apart, however, is our culture. We think of our people as family members and we treat them as such; taking a warm and caring approach to everything from employee safety to career development.

We respect our people and we hold ourselves accountable for our actions and our performances. In this way, we own all our successes and build valued relationships throughout our business and beyond. Both direct employees and contractors are valued and are included in workflow processes and monitored through our human resources and contractor management processes. Any employment or contractor issues that arise are reviewed at the management

level for the group involved – plant management for locally controlled issues or corporate level for broader issues.

Approximately 3,400 persons are employed across Cristal operations worldwide by the end of 2015. Specific site information on employment including contractors, payroll, expenditures on supplies and construction, tax payments, and other information can be found at <http://www.cristal.com/about-us/Pages/site-locations.aspx>

## 13 LABOR/MANAGEMENT RELATIONS

The application of our policies and implementation of our mission and vision occurs at the worker level and the relationship between the worker and their management is the fundamental touchstone. This applies whether workers are represented by a collective bargaining agreement or not. At most of our locations, workers are represented. Agreements with unions include normal wages, premium pay, vacations, holidays, benefit plans including insurance and retirement plans, and other aspects of labor/management relations. There have been no strikes at Cristal locations since 1998. No strikes or lock-outs occurred at any Cristal location in 2014 or 2015.

## 14 OCCUPATIONAL HEALTH AND SAFETY

Our safety vision is to prevent all workplace injuries, illnesses and environmental impact through our Journey to Zero program focusing on achieving world-class safety culture across the organization. Operating safely is an integral part of our business philosophy: “An unsafe tonne is an unwanted tonne,” a value repeatedly set forth by the founder of Cristal.

We are maintaining a robust health, safety and environmental management system with well-established global standards setting the minimum requirements for all of our sites. We recognize that this is not sufficient to continue our journey to zero incidents. In response to that, we established our Journey to Zero program to enhance positive safety culture at our sites. The program focuses on training our leaders from senior management to supervisory level on their contributions as “role models” for promoting safety culture within the organization.

The Total Recordable Incidence Rate (TRIR) measures the rate of recordable workplace injuries and illnesses, normalized per 100 workers per year. Recordable injuries and illnesses include all work-related deaths, illnesses, and injuries that result in a loss of consciousness, restriction of work or motion, permanent transfer to another job within the company, or that require some type of medical treatment other than first-aid treatment. The TRIR is calculated by multiplying the number of recordable injuries in a calendar year by 200,000 (which represents 100 employees working 2000 hours per year) then dividing this value by the total man-hours actually worked in the year. Our TRIR for 2014 and 2015 has returned to the downward trajectory achieved since 2010 after slight elevation in 2013.

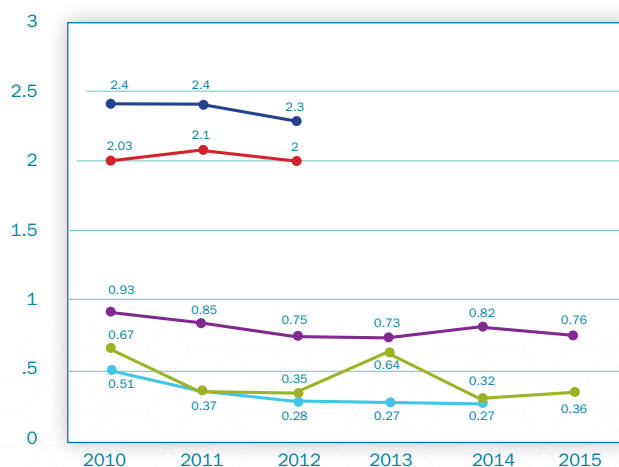


## 15 TRAINING AND EDUCATION

Company-wide, an average of 43 and 39 hours of training per employee were provided in 2014 and 2015 respectively. This includes training on safety, environmental and health protection topics, plus workplace and personal development training. Much of the training is delivered through the Cristal Academy. The development-focused training is discretionary time spent on skills development, as opposed to training that is mandated by a legal requirement. Approximately one training hour in every two is now spent on development activity compared to one hour every six in 2013. Actual development hours per employee rose from seven hours in 2013 to 21 and 18 hours in 2014 and 2015 respectively.

A sustained focus on employee development is fast becoming part of the fabric of Cristal. All supervisors and above levels in the organization receive a documented annual performance and career development review. The majority of those also receive a mid-year review, which focuses predominately on future-forward action and development. For 2014 and 2015, the spend per employee on training were US\$878 and US\$479 respectively.

Comparative Safety Performance



Indicator of Total Recordable Injury Rate (TRIR) shows trend reduction in 2014 and 2015



## 16 COMMUNITY SUPPORT

In each location we are operating, we actively interact with the local communities. Given the large number of programs and locations we operated, we cannot share all our community support activities around the world. In this section, we share with the readers examples of community support activities from different locations in the years 2014 and 2015.

Our TiO<sub>2</sub> pigment production plant in Yanbu, Saudi Arabia has a leading role in community support in the region. Activities include daily water supply to local villages in the Yanbu area that have limited access to potable water; beach clean-up activities at the Red Sea; orphanage support; in addition to charities provided by company and employees.

Our TiO<sub>2</sub> pigment production plant at Bunbury, Australia, supports local/regional emergency response activities, especially bush fires in cooperation with the local fire brigade. Cristal volunteers actively participate in the different events.

Cristal's Stallingborough plant in the North East of Lincolnshire, on the east coast of England, has been a key part of the local community for over 60 years, providing employment for over 450 people with an annual payroll of around £20 million. The site has a

very active Community Team which supports many local charities and community groups in a variety of ways throughout the year. The team is made up of a cross section of employees who volunteer their time to represent the company at many events and donation presentations. Key recent activities involved a team of Cristal employees and their families taking part in a charity run called Glow in the Park – a five kilometer fun run to raise funds for a local children's hospice. The site has also supported a local family whose three-year-old son has an inoperable brain tumor to enable them to travel to the USA for specialist treatment, as well as many donations to local schools and community groups.



Open Day for orphanage children – Yanbu, Saudi Arabia



Wood from Dardanup landfill area donated to an agricultural school – Bunbury, Australia



Cristal employees and their families taking part in a charity run called Glow in the Park – Stallingborough, England



## 16 COMMUNITY SUPPORT continued

Our Paraíba mine in Brazil outsources 55% of its total seedling produced for reforestation activities to the local community at Mataraca. As we approach mine closure in the next few years, we are seeking opportunities to continue support to these families after closure.

Involving local community is an integral part of the operating philosophy of our mining activities in Australia. Activities include donations to local organizations, working with indigenous communities to improve employment and social conditions, and a municipal landfill built at Ginko to reduce pressure on the towns landfills.



Community Open Day – Cristal Mining, Australia



Mataraca community produces over 55% of total seedlings for reforestation of our Paraíba mine in Brazil



Cristal employees participating in bush fire events and emergencies – Bunbury, Australia

## **17** ANTI-CORRUPTION

Global operations are assessed for various risks, including risks related to corruption, on an ongoing basis. Cristal's anti-corruption policies and procedures are communicated to governance board members and employees. Cristal has a system in place for the training of board members and employees regarding its anti-corruption policies and procedures. Such training is accomplished, depending upon the intended audience, either in-person or via online training. There have been no confirmed incidents of corruption during the reporting period of 2014-2015.

## **18** COMPLIANCE

We are committed to comply with all relevant regulations and standards in countries we operate. No non-compliances with laws and regulations relating to provision and use of products or services were identified during 2014 and 2015.

December 2016 reflecting data from calendar years of 2014-2015

<http://www.cristal.com/safety-health-and-environment/Pages/sustainability-reports.aspx>



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This document does not constitute a specification. Product specifications are available on request.

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