CRISTAL
Brilliance inspired by titanium

Sustainability Report

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Cover Photo: Out on a walk in the famed Alsace vineyard of Rangen with his wife and three-year-old daughter, **Andre Piragibe** captured the harmony of industry and nature in this view of the chimneys of our Thann plant, one of the oldest chemical sites in Europe, seen through the vines. "This 200-year-old plant has always made an effort to respect both the environment and communities where our facilities are located," said Andre.

Cristal Sustainability Report

General Note: This report contains information in accordance with the Global Reporting Initiative (GRI) G4 Sustainability Reporting Guidelines Core option, including the Mining and Minerals Sector Supplement. The report also includes more in-depth information in several GRI topic areas.

Where text represents the GRI indicator information, it is shown in blue sections. The GRI content index provides more details.

The reporting period is calendar year 2013. This is the latest data available as of the preparation of this document.

Thank you for your interest in our sustainability performance.

Please send questions or comments to *sustainability@cristal.com*.

Chairman's Welcome

Sustainability is more than a word at Cristal; it is the fiber of our corporate culture.

We are a global multinational family driven by a core passion for excellence in sustainability. "Our success will deliver sustainable and rewarding growth for our people, customers, partners, suppliers and investors," our corporate mission states.

We see effective implementation of sustainability objectives as an essential component of our future success. The paramount production maxim driving our employees is, "An unsafe ton is an unwanted ton."

Sustainability has been embedded into our work culture long before we embarked on preparing this Global Reporting Initiative (GRI) Sustainability Report. Our care for the environment as we provide economic value for our stakeholders is out of deep respect for the social concerns of the communities in which we operate.

While we are pleased with our progress to this point, we continue to challenge ourselves to keep improving performance in all the three spheres of sustainability—economic, environmental and social impact.

Thank you for reading this, our first sustainability report prepared to internationally recognized Global Reporting Initiative (GRI) sustainability reporting standards.

We encourage and welcome your feedback.

Dr. Talal Al-Shair
Chairman and CEO, Cristal

Corporate Sustainability Commitment Statement

Cristal will be the recognized leader for products and services that create a brighter and cleaner world. To achieve this vision, we recognize that sustainability is the key to creating an environmentally and socially responsible and financially sound business.

Cristal's sustainability focus will drive efficient utilization of our existing operating facilities and raw materials recognizing that our natural resources are limited. We will incorporate sustainability in our product and process development efforts and decision—making process in a way that reduces the impacts of our products and processes on the environment and develops new products that contribute to a cleaner environment.

In support of this policy, we will:

- Establish sustainability objectives to drive continuous improvement in all aspects of our business.
- Actively engage in dialog with our key stakeholders (suppliers, customers, employees and communities) to promote environmental outcomes which are fully compliant with local regulations and are protective of resources and the environment.
- Measure and reduce the environmental footprint of our existing processes and products while improving our cost competitiveness and maintaining our customer satisfaction.
- Identify new methods, products and processes that support our sustainability policy.

View of Cristal's Thann, France plant from the neighboring vineyard

Our Commitment

At Cristal, we strive to be exemplary in our Safety, Health and Environmental (SHE) performance.

We manage our worldwide businesses and facilities with a focus on the protection of the environment, and the safety and health of employees, contractors, customers, and the public. We believe that all workplace injuries, illnesses and adverse environmental impacts are preventable. Safety, health, and environmental excellence is a global value which unites our company and is essential to the sustainability of our organization.

In support of this policy, we are committed to:

Legislative and Standards Compliance

- Meet or exceed all applicable laws, regulations and company standards in those countries where we do business.

Workplace and SHE Accountability

- Make safety, health, protection of the environment, and security the direct responsibility and accountability of all employees, contractors and visitors. Working in a safe, healthy, secure and environmentally responsible manner is a condition of employment or contract.
- Maintain a safe and healthy workplace, operate our facilities in an environmentally responsible manner and assure safe and secure supply chain practices.
- Promote and encourage safety, health and wellness programs on and off the job.

Safety, Health and Environmental Priorities

- Provide workplace policies, standards, procedures and training to ensure that employees and contractors can perform their jobs in a safe, healthy and environmentally responsible manner.
- Implement the principles of risk analysis and risk management in all areas of safety, health and environmental protection.

Resource Conservation

- Establish focused efforts to preserve natural resources through rational utilization of operating facilities and raw materials.

Product Stewardship

- Incorporate sustainability and product stewardship in our product and process development efforts and decision-making process in a way that reduces the impacts of our products and processes on the environment and develops new products that contribute to a cleaner environment.

Community Service

- Actively participate in communities and support our employees' efforts to positively impact the quality of life locally and beyond.

Continual Improvement

- Investigate incidents to determine root causes and take prompt and appropriate actions to correct deficiencies. Communicate the knowledge gained and lessons learned to prevent recurrence in the company.
- Periodically review the Safety, Health and Environmental Management System with special emphasis on possible improvements.

Safety, Health and Environmental Excellence

- Establish Safety, Health and Environment measurable objectives to drive continual improvement, and routinely communicate the progress against objectives.
- Promote discussion, sharing of best practices across all company facilities.
- Actively engage in dialog with our stakeholders to promote safety, health, security and environmental outcomes that are mutually acceptable and fully compliant with regulations.

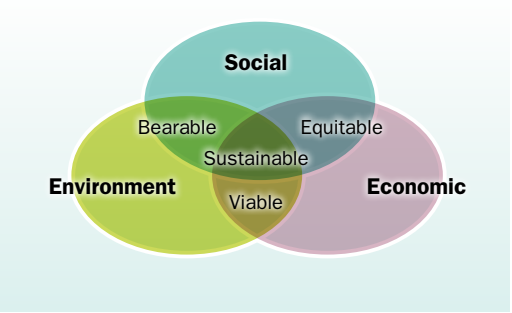
1 Strategy and Analysis

Cristal is committed to not only preserving, but also enriching lifestyles in every region where our offices, mines, manufacturing plants, and other facilities are located. By protecting the environment, providing jobs, and giving back through philanthropic efforts, Cristal strives to be a valuable and responsible corporate citizen. We have been working to improve our performance in these areas, and have had success in several areas, including:

- Cristal is playing a leading role in the Titanium Dioxide Manufacturers Association (TDMA) initiatives to develop a product carbon footprint accounting and reporting methodology for our core business. This will now be expanded into a life-cycle assessment to understand broader environmental impacts.
- TiONA® titanium dioxide pigments produce brighter surface coatings and paint, which results in lower space lighting energy usage and carbon footprint reduction for consumers. Because it is an effective reflectant of light, it is also useful in cool roofing applications for more efficient heat management.
- Our specialized CristalACTiV™ products are being used in a range of applications to remove pollutants from air and water.
- We have aggressively reduced energy and water use at our manufacturing and research facilities, using innovative technologies such as wind turbines and cogeneration of electricity and steam. Our mine in Paraíba, Brazil, for example, generates 90% of its power from a renewable energy combination of wind turbines and sugar cane waste.
- Our safety performance is among the best in our industry sector.

We are aware that our planet is experiencing sharply increasing demands for resource consumption per capita that must be met with finite resources. In particular, our primary raw material, titanium ore, is a finite resource found in specific geographic locations. Water stress is a reality in many areas of the world, including some parts of Australia where we operate. Higher energy costs and possible shortages are anticipated in the next 10 years. We also expect growing legislative action by governments around the globe and expanding interest from customers and other stakeholders about our sustainability performance.

This year, we created a formal company-wide sustainability team to develop our first sustainability report using the internationally recognized Global Reporting Initiative (GRI) sustainability guidelines. As part of this process, we conducted our first materiality assessment and are working to understand our performance in the aspects of sustainability that are significant to Cristal as a company and to our stakeholders. Due to the retrospective nature of this report, data was not available from all locations for all indicators. The report reflects data for calendar year 2013, the latest available for this publication. Any data limitations are reported. We are in the process of setting strategic goals and targets for performance improvement and will discuss them in our next report. We firmly believe that sustainability success is fundamental to our growth strategy as a company.



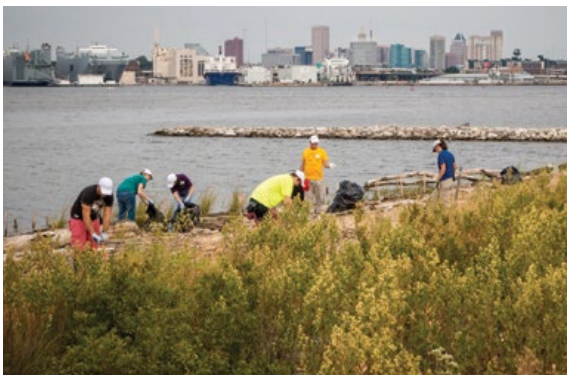
Cristal views sustainability holistically, taking into consideration environmental, economic and social spheres of impact.

At a global level, Cristal impacts all three tenets of sustainability in positive ways. Our economic and social contributions are foundational to the wellbeing of our over 4,500 employees, their families, and the economic health of the communities in which we operate. Our products have numerous environmental benefits. CristalACTiV™ is used to reduce air emissions, in water treatment and in the manufacture of more efficient and cost-effective solar energy collection panels.

Our operations are subject to a variety of laws, regulations and standards regarding safety, health and environmental (SHE) protection; import and export controls; and standards of ethical business conduct. All of our employees are trained to conduct business ethically and in compliance with all applicable laws.

Sustainability issues are managed through our existing executive steering body leadership structure; management in functional areas spanning SHE, manufacturing, research, sales, logistics, human resources, purchasing, and others; specialized teams focusing on energy and utility efficiency and operational excellence; facility-level community engagement teams, and other initiatives; and a new cross-functional sustainability team charged with coordinating company-wide efforts to define a comprehensive program and drive performance improvements.

Sustainability is also becoming increasingly important to our stakeholders. We have been engaging with key stakeholders and are initiating a more comprehensive program to assess the sustainability performance of our suppliers. This report is the first step in a new initiative to understand our sustainability risks and opportunities more completely. Key aspects were defined through a materiality assessment. Indicators were selected and performance is reported in this document. Targets for improvement will be set in 2015.



Volunteers from Cristal's Baltimore Research Center (RCB) helped restore and regenerate large areas of Masonville Cove in Baltimore, Maryland, USA. The project involved two major activities; clearing out pollutant debris and planting native wetland grasses.

Teaching the next generation to care for the environment at Bunbury, West Australia

Facilities in Yanbu, Saudi Arabia have been active in economic, environmental and social initiatives. Cristal was a sponsor of the First International Environmental Conference and Exhibition in the Kingdom of Saudi Arabia. The event was organized by the Royal Commission in Yanbu and focused on the best environmental sustainability technologies in the field of industrial waste management. Over 350 professionals participated in the conference and exhibition.

HH Prince Saud Bin Thunayyan (left), Chairman of the Royal Commission for Jubail and Yanbu (RCJY), presents a plaque of appreciation to Dr. Talal Al-Shair, Chairman & CEO, for Cristal's support of the First International Environmental Conference (FIEC) in Yanbu, Saudi Arabia, as principal sponsor.

2 Organizational Profile

In 2013, Cristal was the second largest titanium dioxide producer in the world, the largest producer of merchant titanium chemicals, a leading manufacturer of specialty titanium products and a fast-growing producer of mineral sands and titanium metal powder.

Headquartered in Jeddah, Saudi Arabia, Cristal has nearly 30 facilities around the world. Some sites house several operations. These multi-operation sites include mineral sands mines in Australia and Brazil; titanium dioxide manufacturing facilities in Australia, Brazil, France, the Kingdom of Saudi Arabia, the United Kingdom, and the United States of America; titanium metals and powders production in the United States of America; and commercial, research, sales, and warehousing facilities in Australia, Belgium, Brazil, China, France, the Kingdom of Saudi Arabia, the Republic of Korea, Singapore, Switzerland, the United Kingdom, and the United States of America. The company was privately held: 66% by TASNEE, 33% by Gulf Investment Corporation, and 1% by a private investor with net sales of $2 billion in 2013.

The company has approximately 4,500 employees. Contract workers are employed at some locations for support functions. Statistics regarding gender and collective bargaining status are not kept. There are no seasonal variations in workforce or self-employed workers.

Cristal provides numerous products for a variety of industries around the world. In coatings, plastics and paper, our pigments and services are used to improve everyday life – creating brighter paint, more durable PVC windows, and a special printing ink. Thousands of products worldwide, from automotive coatings to aerospace parts, include products from Cristal.

The key markets we serve include:

- Paint and coatings
- Plastics
- Decorative paper for laminate surfaces
- Specialized pigments
- Electronic chemicals
- Metal and glass surface treatments
- Titanium metals (sponge and powder)
- Catalysts for polymerization
- Pharmaceutical and chemical synthesis
- Catalysts for air and water pollution control

We also sell a variety of other products, including:

- Carbon dioxide
- Copperas
- Gypsum
- Hydrochloric acid
- Iron chlorosulfate
- Molten sulfur
- Sodium silicate
- Sulfuric acid

These products are used in applications that range from chromate reduction in cement, plasterboard manufacturing, metal treatment, waste and drinking water treatment, and animal feed.

Our Specialty Chemicals and Materials business supplies chlorine for internal use. It also provides, caustic soda, caustic flakes, dry precipitated silica, hydrochloric acid, sodium hypochlorite, and sodium silicate solution for markets including paper and pulp, plastics, solvents, refrigerants, pigments, insecticides, dye stuffs, varnishes, silicon, rubber, chemical and petrochemical manufacturing, and water treatment.

Our supply chain is back integrated into feedstock mining with a mine in Paraíba, Brazil and as owner of Cristal Mining Australia Limited, the world's 5th largest TiO_2 feedstock producer. Products of the mines include leucoxene, rutile, zircon, and ilmenite.To learn more about our product offerings, see our Products & Services webpage at *www.cristal.com*.

Cristal is the only company that currently demonstrates its full commitment to the entire titanium value chain. Key areas of investment include construction of a titanium-ilmenite ore smelter in Jazan, KSA to produce slag as a feedstock for our manufacturing sites and pig iron as a valuable co-product. Additionally, the company recently announced a joint venture with Toho Titanium Company to manufacture titanium sponge in KSA, and an agreement to acquire the titanium dioxide assets of Jiangxi Tikon Titanium Company, Ltd. in China. We have expansions underway at several locations.

New technology and processes at our titanium metal manufacturing facility in Ottawa, Illinois will further improve our ability to produce high quality titanium metal for aerospace, medical devices and other applications. Additionally, we are supporting Dyesol Australia, a third generation photovoltaics company in which our parent company, Tasnee, holds a significant share.

No significant changes in the company's size, structure, ownership or supply chain occurred in 2013 (the reporting period for this document). We are a dynamic organization, and any relevant future changes will be reported in our next GRI report.

Cristal is an active participant in the Cefic[1] Titanium Dioxide Manufacturers Association (TDMA)[2] and the Titanium Dioxide Stewardship Council (TDSC)[3]. We hold the chair of the US Titanium Dioxide Stewardship Council and of the Cefic Titanium Dioxide Manufacturers Association Technical Committee[4] and are members of similar associations for Cristal's co-products. Many of our experts participate in the working groups of these associations, such as those sharing best practices in the safe handling of our products and publishing guidance for downstream users, and others engaging with government agencies on relevant regulatory policies for our industry. We are also active members of chemical industry trade associations in several of the countries in which we operate, such as the UK Chemical Industries Association (CIA)[5], the Bahia State Industry Federation (FIEB)[6], the Brazilian Chemical Association (ABIQUIM)[7], and the Union of Chemical Industries (UIC)[8] in France. We belong to trade bodies, such as the UK Confederation of British Industry (CBI)[9], in which we liaise with local and national politicians and influencers to advance programs critical to the sustainability of our operation. These programs include training and skills development and national energy security and infrastructure policies.

Additionally, we participate in trade groups relating to end uses of our products, including the Surface Coatings Association Australia[11], the US Green Building Council (USGBC)[12], and the NPE International Plastics Showcase produced by the Society of Plastics Industry (SPI)[13]. We also sponsor a paint quality program at the Brazilian Coatings Manufactures Association (ABRAFATI)[10]. These efforts allow us to engage with our customers, understand issues of significance to them, and collaborate to promote the safe and effective use of our products.

Key external initiatives in which Cristal participates and/or holds leadership positions:

1 Cefic European Chemical Industry Council *www.cefic.org*

2 Titanium Dioxide Manufacturers Association (TDMA) *www.tdma.info*

3 Titanium Dioxide Stewardship Council (TDSC) *www.tio2industry.org*

4 Titanium Dioxide Manufacturers Association Technical Committee *www.tdma.info*

5 UK Chemical Industries Association (CIA) *www.cia.org.uk*

6 Bahia State Industry Federation (FIEB) *www.fieb.org.br*

7 Brazilian Chemical Association (ABIQUIM) www.*abiquim.org.br*

8 Union of Chemical Industries (UIC) *www.uic.fr*

9 Confederation of British Industry (CBI) *www.cbi.org.uk*

10 Brazilian Coatings Manufactures Association (ABRAFATI) *www.abrafati.com.br*

11 Surface Coatings Association Australia *www.scaa.asn.au*

12 US Green Building Council (USGBC) *www.usgbc.org*

13 American Coatings Association *www.paint.org*

3 Identified Material Aspects and Boundaries

Since Cristal is privately held, no consolidated financial statements or equivalent documents are published. The sustainability program includes all operations of the company. Temporal scope of this report is calendar year 2013, with additional longitudinal data provided to show perspective of 2013 performance.

This is the first sustainability report following the Global Reporting Initiative (GRI) guidelines developed and published by Cristal. The G4 standards were used, including the Metals & Mining Sector Supplement, with the 'in accordance' core option. The GRI Technical Protocol was followed to define report content. Aspects defined as material are:

- Economic Performance
- Market Presence
- Materials
- Energy
- Emissions
- Effluents and Waste
- Compliance
- Employment
- Labor/Management Relations
- Occupational Health and Safety
- Training and Education
- Local Communities
- Anti-corruption
- Emergency Preparedness
- Product Regulatory Compliance
- Closure Planning (for mines only)
- Biodiversity (for mines only)

This report includes the General Standard Disclosures, and Specific Standard Disclosures of the Generic Disclosure of Management Approach (DMA) and at least one indicator for all material aspects. Additionally, indicators are reported for several non-material aspects including:

- Water
- Products and Services
- Supplier Environmental Assessment
- Diversity and Equal Opportunity
- Social Compliance
- Product and Service Labeling
- Customer Health and Safety
- Materials Stewardship
- Sustainable Consumption
- Anti-competitive Behavior
- Supplier Assessment for Impacts on Society
- Marketing Communications

The Stallingborough plant in North East Lincolnshire, on the East coast of England, has been an important direct and indirect employer for over 60 years. Approximately 450 employees and 100 contractors work at the plant. Annual payroll and benefits amount to approximately £21 million (US $36 million), with more than £133 million (US $240 million) annual purchases of goods and services.

Members of the 25 Year Club received their certificates of achievement for 25 and 40 years' Service.

Pictured Left to Right – Front Row: Jamie Scott (Site Director), Julian Atkin, Mick Bunce, Vince Kinnaird, Charlie Herring. Back Row: Mike Jackson, Les Pask (25 Year Club Chairman), Michael Main, Jason Melville.

Stallingborough also has a very active community awareness committee that engages with schools, community groups and institutions. The committee volunteers have been involved with and sponsored several significant local projects that support playground improvements and community building restoration in the last few years. The Young Enterprise initiative brings Cristal employee volunteers together with groups of young entrepreneurs to promote business awareness and leadership.

The Cristal team in the corporate offices in Hunt Valley, MD USA participates in various local outreach efforts through the "InTouch" program. Volunteers participated in Baltimore's Habitat for Humanity home program, as well as organized cleaning efforts at Oregon Ridge Park in Baltimore County, Maryland.

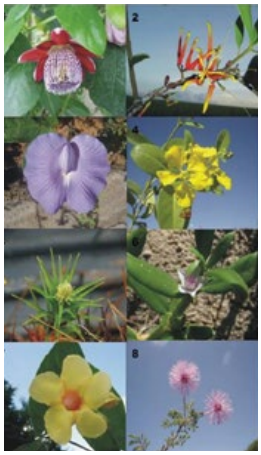
Material aspects were chosen through a formal materiality assessment that considered direct and indirect impact on the company's ability to create, preserve or erode economic, environmental and social value for itself, stakeholders and society-at-large, both now and in the future. The results of the assessment reflect Cristal's wider sustainability context, including significant economic, environmental and social impacts. They also reflect any topics that would substantively influence the assessments and decisions of stakeholders. The materiality assessment methodology and results were documented and the process will be repeated in subsequent reporting periods.

Aspects were prioritized by assessing their significance to the company and stakeholders. All content has been validated by assessment against the completeness principle, to check against the dimensions of scope, boundary and time. An external consultant was engaged to assist in definition and validation of report content. Some GRI aspects that were not considered material through the formal assessment are included in this report because the authors believe that Cristal activities in this area would be of interest to readers.

Since the materiality assessment was conducted during 2014, and data reported here reflects calendar year 2013, full data is not available for some indicators. Content quality has been reviewed against the principles of balance, comparability, accuracy, timeliness, clarity, and reliability, and meets all to the fullest extent possible given data availability. Any limitations are discussed in the report sections for affected indicators.

Cristal executive decision-makers have reviewed and approved the content of this report. Since this is the first GRI report, there are no restatements or changes from previous information.

Academic research relating to restoration of mined areas at our mineral sands mine in Paraíba, Brazil resulted in expansion of scientific knowledge through academic research leading to five published papers, one undergraduate degree, two Master's degrees, and two doctoral degrees, with two more doctoral degrees in progress.



Assessment of Coastal Dune Forest Restoration in Mining Areas (Mataraca, Paraíba, Brazil), Bachelor's Degree in Science, Researcher: Ravi Cajú Duré Advisor: Prof. Dr. Regina Maria de Vasconcellos Barbosa, Institution: UFPB; **Vocal Communication of *Sapajus flavius* (monkeys) in Wild,** Master of Animal Biology. Researcher: Monique Bastos Araújo: Prof. Dr. Antonneio Silva Souto Co-advisors: Prof. Dr. Nicola Schiel and Prof. Dr. Bruna Bezerra, Institution: UFPE;

Diversity and Ecology of Mycorrhizal Fungi in Revegetated Dune Areas and Natural Sandbanks after Mining Activity in the city of Mataraca – Paraíba, Doctor of Fungi Biology. Researcher: Danielle Karla Alves Silva Advisor: Prof. Dr. Leonor Costa Maia, Institution: UFPE;

Biological Soil Properties in Revegetated Coastal Dune Areas after Mining in Northeastern Brazil, Doctor of Fungi Biology. Researcher: Indra Elena Costa Escolar Advisor: Prof. Dr. Leonor Costa Maia, Institution: UFPE;

Ecology and Genetic Diversity of Arbuscular Mycorrhizal Fungi in Continental and Islander Marshes of Brazil Doctor's in Fungi Biology. Researcher: Iolanda Ramalho da Silva Advisor: Prof. Dr. Leonor Costa Maia, Institution: UFPE; **Behavioral Ecology and Aspects of Molecular Biology Aspects of *Sapajus flavius,*** Doctor of Animal Biology, Researcher: Monique Bastos Araújo Advisor: Prof. Dr. Bruna Bezerra, Institution: UFPE

4 Stakeholder Engagement

For this initial report, stakeholder engagement was accomplished through existing company contacts. Interactions occur routinely through commercial relations with customers, suppliers, and frequent activities with communities where company operations exist. Specific stakeholder groups are listed in the organizational profile section of this Report, and in individual site fact sheets that are available at *http://www.cristal.com/about-us/Pages/site-locations.aspx*. Some of these interactions focus specifically on sustainability issues; others are broad-based and can include sustainability. Topics raised through the range of stakeholder interactions were considered in the materiality assessment. Details on significant stakeholder interactions are presented throughout this report in discussions on Cristal performance for the applicable GRI Indicators.

5 Report Profile

The reporting period for this document is calendar year (CY) 2013, because that is the latest period for which data is available. No prior report according to GRI standards, or other recognized reporting standards, has been created. The frequency for future reports is under consideration. Since the materiality assessment was conducted during 2014, some relevant data may not be available for a complete calendar year until 2016 for CY 2015. We plan to define goals and continue with performance improvement activities during CY 2015, but it may not be appropriate to issue a report that year since data may not be available.

The contact for questions regarding this report or feedback and suggestions for our sustainability program is Chris Wiernicki, Director, Environment, Sustainability and Growth. He can be reached at *sustainability@cristal.com*.

This report has been prepared using the in accordance Core option. The GRI Content Index is provided beginning on page 39 of this report. External assurance has not been sought for this initial report, although an external consultant assisted with content definition and verification.

Cristal's Bunbury Australia has been involved in a variety of community activities over the years, including a recent open house to celebrate 50 years of operation at Australind and 25 years at Kemerton.

The Cristal facility at Yanbu, Kingdom of Saudi Arabia, hosted children from a local orphanage at a tour of educational and fun attractions, including the Royal Commission Gardens, the Royal Commission Beaches, the Marine Life Aquarium at Yanbu Al Bahr, and the Disney Park. The children were treated to lunch and dinner, and received gifts from Cristal personnel.

VISION, MISSION AND VALUES

Vision:

Inspired by the brilliance of titanium, we deliver cutting-edge solutions that create a cleaner and brighter world for generations.

Mission:

We strive to unleash the brilliance of titanium to provide great opportunities and safe environments for our communities. Our success will deliver sustainable and rewarding growth for our people, customers, partners, suppliers and investors.

Our Family Values:

Caring

Safety is paramount for our family members and the communities. We act with openness and fairness in all our relationships, respect others and value their diversity. We hold ourselves and each other accountable for our actions and performances and have a personal sense of ownership of the business.

Collaborative

We are committed to working together. We believe in clear communication and looking at things from different points of view in order to really understand what you need. This way we can build a leading team to deliver excellence.

Passionate

We are passionate about what we do, going the extra mile to challenge the status quo, and constantly striving to improve. We are never satisfied with mediocrity and are driving the business forward. We lead innovation in titanium solutions by being inquisitive and enterprising.

Professional

We demonstrate the highest levels of professionalism and integrity through everything we do. We are focused on our business objectives and getting a good result. We are constantly learning and use our knowledge and expert skills to get things done.

6 Governance

The members of Cristal's highest governance structure, the Steering Body, are identified at *http://www.cristal.com/about-us/Pages/leadership.aspx*. Authority and responsibility for development of programs and decision-making regarding economic, environmental and social issues is delegated through a series of management structures, defined in policies and procedures, implemented through training, and monitored and managed in clearly communicated channels directly from the Steering Body to individual company employees at the relevant levels.

Since Cristal is privately held, some GRI governance information is not collected or reported.

Senior leadership team strategy planning

7 Ethics and Integrity

It is the company's policy to conduct business ethically and in compliance with all applicable laws. A detailed Cristal business ethics and conduct policy defines specific responsibilities applicable to the company, supervisors/managers, employees and officers. It describes communication channels for taking action when needed. Concerns may be raised confidentially and by telephone, through email, in person, or through a compliance hotline, which is available 24 hours a day, 7 days a week. The policy makes clear that the company will not tolerate threats or acts of retaliation or retribution for using any communication channels to raise concerns. All employees receive training in the policy.

8 Economic Performance

Economic performance was defined as material and reportable based on both internal company priority and stakeholder priority. At its core, economic success allows continued operation of any company, including Cristal. Economic performance is managed by monthly, quarterly and annual reviews and adjustments in resource allocations. The effectiveness of this approach is shown in the results demonstrated in subsequent review periods.

The GRI Mining and Metals Sector asks companies to report countries of operation that are either candidate to or compliant with the Extractive Industries Transparency Initiative (EITI). Brazil, Australia, Saudi Arabia, France and UK are not participating in EITI. The US is a candidate country, but no Cristal mining operations occur in the US.

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; direct charitable donations to communities; and the economic benefit realized by our customers through their use of our products. We employ approximately 4,500 people directly, and over 500 full-time contractors. Net sales in 2013 were approximately $2 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.*

9 Market Presence

Market presence was defined as material and reportable based on both internal company priority and stakeholder priority. This comprises both local presence within communities where we have operations and industry presence in the international marketplace. It is managed as a growth objective at both levels, with development plans proposed, reviewed and implemented through formal company funding processes. Success of initiatives is monitored at both local and company levels through financial performance metrics, and adjustments are made as needed.

In 2013, Cristal was the world's second largest producer of titanium dioxide products. Information about our market presence in local communities provided in the individual site fact sheets at *http://www.cristal.com/about-us/Pages/site-locations.aspx.*

Mine site restoration also provides livelihood for local families.

Cristal Paraíba Seedlings Production

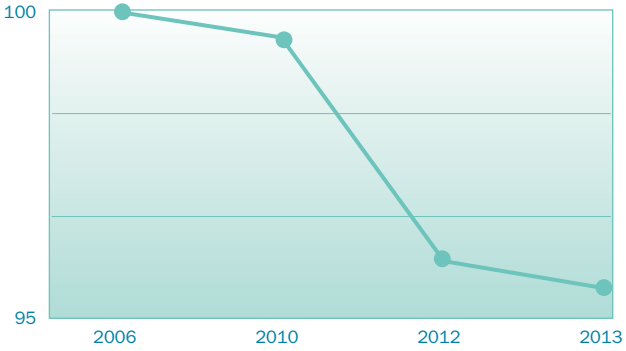
Ten families from the surrounding community produce 80% of the seedlings.

10 Materials

Materials use was defined as material and reportable based on both internal company priority and stakeholder priority. Cristal's business is based on transformation of raw materials, principally titanium dioxide ore, into a variety of finished titanium products. Since the ore is a finite resource, our management of this resource is crucial to continuation and sustainability of the company. Raw material cost is also a significant component of finished product cost, and therefore of the profit margin. Quantities and costs are tracked as part of routine financial performance monitoring. Opportunities for materials use efficiencies, including recycling, are aggressively sought and implemented. This has resulted in approximately a 5% reduction in tonnes of feedstocks, chemical and other material usage required per tonne of TiO_2 product plus co-products.

Material Use Per Tonne of Product* – TiO_2 Plants

2006 = 100



*TiO_2 and co-products sold

Indicator of materials efficiency shows continual reduction in materials use.

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

Cristal has embarked on a program to recycle packaging materials for our products, including flexible intermediate bulk containers (FIBC) and paper sacks and bags. In CY 2013, we recycled over 13,000 containers, saving over 40,000 kg of greenhouse gas emissions, which corresponds to roughly the carbon bound by 3,000 trees.

Cristal Metal's Ottawa plant manufactures titanium powders and alloy metals. This plant is the first facility of its type in the world, exclusively producing high-purity titanium powders through the patented Armstrong Process® technology. The Ottawa plant uses clean technology to produce products while generating sodium chloride (NaCl)—table salt, road deicer—as the only routine process waste.

Cristal Metals also takes part in programs to help the local community.

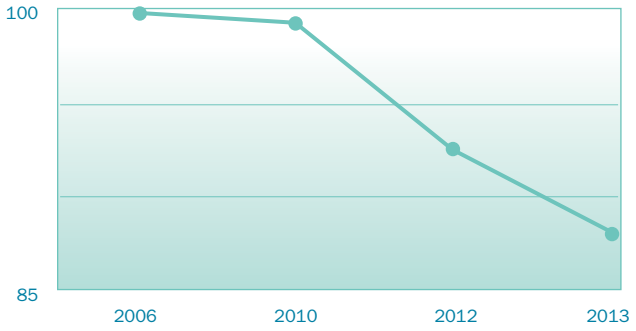
For the second consecutive year, members of the Cristal Metals team participated in the Labor of Love initiative sponsored by the United Way of Eastern LaSalle County. Each year, local businesses in the Ottawa area volunteer their time to rehabilitate homes for community members in need. This year the group painted, replaced siding, installed plumbing fixtures and performed landscaping work for a resident undergoing cancer treatment.

11 Energy

Energy was defined as material and reportable based on both internal company priority and stakeholder priority. Energy use is a key cost and a main component of our carbon footprint. Energy costs have been routinely monitored, and opportunities for energy use reduction have been aggressively sought and implemented. Carbon footprint has recently been defined through an industry-wide project of the Titanium Dioxide Manufacturers Association (TDMA)[1]. The average product carbon footprint for all Cristal's TiO_2 products is somewhat lower than the industry average footprint calculated and reported by TDMA. Carbon footprint reduction goals are being set and will be tracked during calendar year 2015. They are anticipated to drive further improvement in our energy use. Our energy efficiency activities since 2006 have resulted in an approximately 12% reduction in energy required per tonne of total productive output at our TiO_2 plants, including TiO_2 product and coproducts created.

Energy Use Per Tonne of Product* – TiO_2 Plants

2006 = 100



*TiO_2 and co-products. CO_2 from energy used as proxy.

Table 1. Indicator of energy efficiency shows continual reduction in energy use

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

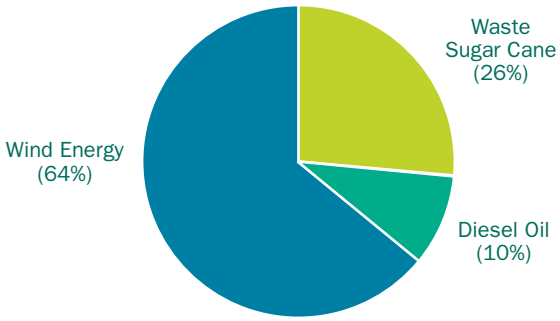
Cristal also has an active energy team and utilities efficiency lead engineer who, with representatives from each of our operations, are constantly looking for ways to cut energy use and associated carbon footprint, and minimize water and raw materials use. Projects identified recently include cogeneration, wind power, solar power, tidal power, energy efficiency upgrades and other improvements that have contributed to a roughly 10% energy reduction since 2006.

[1] *http://www.tdma.info/fileadmin/pdf/substainability/CF%20PCR%20Methodology%20Summary_December%202013.pdf*

Energy Efficiency in Action

The Cristal mine in Paraíba, Brazil generates more than 90% of all consumed energy from renewable sources. All of its electric power is generated by a wind farm installed at the mining area, consisting of 13 wind turbines, with a nominal capacity of 10.2 MW. All the thermal energy required for heating the processing furnace comes from the burning of biomass, purchased directly from local suppliers. Only 10% of the energy used at Paraíba comes from fossil sources. Fossil fuels are used by vehicles and machinery.

Annual Energy Consumption – 2013



Over 90% of the energy consumed by Cristal Mineração do Brasil is from renewable sources.

Windmills at Paraíba

The Ginkgo mine site in Australia has recently retrofitted haul road lights from metal halide to photovoltaic powered LED floodlights, saving five tonnes of greenhouse gas (CO_2e) per year.

12 Water Consumption

This aspect was not defined as material in the Materiality Assessment conducted in August of 2014 that included a broad cross-section of company and external perspectives. However, the authors of this report believe that Cristal activities in this area would be of interest to readers.

Since 2006, water use efficiency programs have resulted in a 12% reduction in water use per tonne of TiO_2 and coproducts created at our TiO_2 plants.

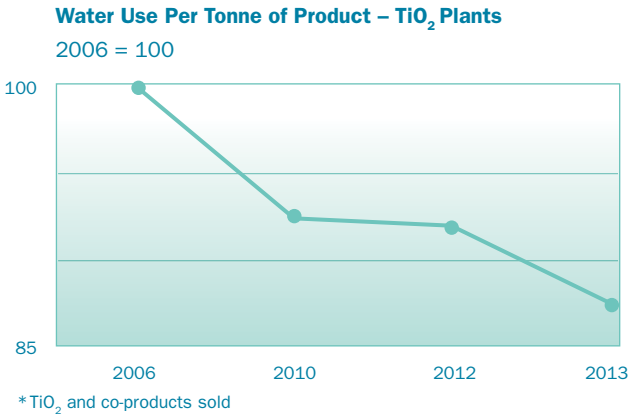


Table 2. Indicator of water consumption shows continual reduction in water use

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

Our Stallingborough, UK site won the 2012 Humber Industry Nature Conservation Award (INCA) for developing a new nature reserve in the local village of Healing, Northern Lincolnshire. The project enhanced biodiversity in cress beds by creating wet grassland that contributes to development of more sustainable water sources. The site has also reduced emissions by 92% since 1990, with additional reductions in energy and water usage and waste production.

Cristal Bunbury Operations in West Australia include two TiO_2 facilities, Kemerton which produces base pigment, and a finishing plant at Australind. The plant has worked steadily to reduce air emissions, waste, and water use. Carbon footprint (CO_2 tonnes/ tonnes of net product packed) has been reduced more than 10% since 2000, waste solids have been reduced by 40% since 1989, and water use has been minimized by over 35% since 1995.

13 Biodiversity

Biodiversity was defined as material and reportable based on both internal company priority and stakeholder priority for the mines. Titanium dioxide mining temporarily disrupts the land surface, and often occurs adjacent to bodies of water. Biodiversity protection and land restoration have long been a focus for Cristal mining operations. In fact, we have been recognized by external bodies for excellence in mine restoration activities.

While this GRI aspect relates mainly to our mines, other Cristal locations—notably Thann, France and Stallingborough, UK—have also implemented projects focusing on enhancing biodiversity.

Total land disturbed and not yet rehabilitated: (A: opening balance) = 1,932 hectares
Total amount of new land disturbed within the reporting period: (B) = 144 hectares
Total amount of new land newly rehabilitated within the reporting period to the agreed end use (C) = 168 hectares
In 2013, we have over 600 ha in rehabilitation. Much of this area, however, will require several more years to fully achieve the agreed end uses.
Total land disturbed and not yet rehabilitated (D = A+B-C) = 1,908 hectares
Much of this is in the process of recovery, but is not yet fully rehabilitated.

In addition to rehabilitation at active mines, Cristal Mining Australia Limited (Mining West) currently has 206 ha being rehabilitated to native vegetation at inactive mining sites. This vegetation ranges from 0-14 years of age. This includes Ludlow (105ha), Jangardup (45ha), Gwindinup (27ha) Yarloop (8ha) and Wonnerup (21ha). Two rehabilitated mines in Australia, Yarloop and Jangardup, are currently being assessed by the national environmental agency (EPA) for closure.

The Gwindinup mine site in Western Australia is also in rehabilitation phase. 61 hectares of mined land has been revegetated to date. This includes 15.5 hectares of native vegetation, which after above average winter rains is progressing well with healthy growth and diversity. A total of 7,084 seedlings, 3,230 sedges and 180 advanced trees were planted in 2013. Native seed made up of over 90 species also was broadcast by hand. A further 44 hectares of revegetation is expected to be established in 2014, split into both pasture re-establishment and native vegetation. The revegetation program is expected to continue through 2016.

Cristal Mining's commitment to the environment was recognized by the New South Wales Minerals Industry. At the Environment and Community conference, Cristal Mining was awarded the prize of Highly Commended for rehabilitation work at the Gingko mine site. The award ceremony recognizes companies that exhibit beyond best practice achievements in the fields of environment management and community.

Additionally, Cristal Mining Australia Ltd and partners Ogyris Ecological Research and the Federation University Australia funded a $280,000 revegetation research project to improve environmental outcomes after mining in the Murray Darling Basin. The project aims to increase the overall revegetation success rate of local arid woodland vegetation following mining.

Rehabilitation at Gwindinup mine site, Western Australia

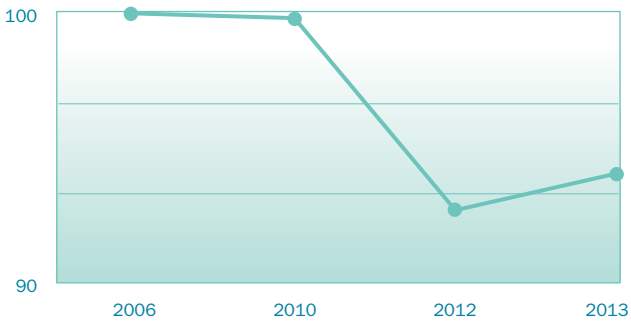
14 Emissions

Emissions were defined as material and reportable based on both internal company priority and stakeholder priority. Our manufacturing locations generate greenhouse gas (Scope 1 and Scope 2) and other air emissions. These emissions are controlled by government-issued permits. Monitoring and reporting of emissions occurs at various frequencies and is tracked by internal and external groups. At the mines, this includes both major mobile sources and stationary sources. Emission minimization strategies are sought and implemented when feasible. Completed energy use reduction projects have reduced greenhouse gasses and other emissions. Additional reduction targets will be set in 2015.

The graph below shows the carbon footprint reductions achieved by Cristal across the company from 2006 through 2013 expressed as the average kg of CO_2 produced for each kg of TiO_2 and coproducts manufactured. The overall reduction over this time period is about 6%. Cristal is committed to continue to reduce the carbon footprint of our business by improved manufacturing efficiency, waste reduction, improved emissions controls, alternative energy and other methods that support all the areas sustainability.

Carbon Footprint (CO_2e) Per Tonne of Product* – TiO_2 Plants

2006 = 100



*TiO_2 and co-products

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

The Bahia Plant, located on the northern coast of the state, close to Arembepe, is the only integrated plant for TiO_2 in South America. The plant has had success in reducing emissions, energy use and waste. Carbon footprint has been reduced by roughly 20% since 2006. Total energy use has been reduced by over 37% since 2003, and waste reduced by over 50% since 2001.

The Cristal Bahia plant received a National Award for Energy Conservation and its Rational Use granted by the Ministry of Mines and Energy.

Cristal's Bahia plant has also been active in many programs that support the local communities, including:

- Camaçari Sea Coast (support to local fishermen)
- Education (encouraging reading for more than 300 children per year, professional training to help enable residents seeking employment and partnerships with local public schools)
- Environmental education (in partnership with NGO and community leaders)
- Income generation (community supportive programs that provide job skills to help residents generate income)
- Health and wellbeing (participation in the local health council)
- A health education
- Youth education on drug abuse and its dangers
- Lectures on environmental education

Additionally, Cristal partners with Amorvoc (Association of Volta do Robalo Residents) to support selective waste collection. All materials collected are sold to a recycling cooperative and proceeds are used to maintain an educational program for local children in the low-income communities of Arembepe, Brazil.

15 Effluents and Waste

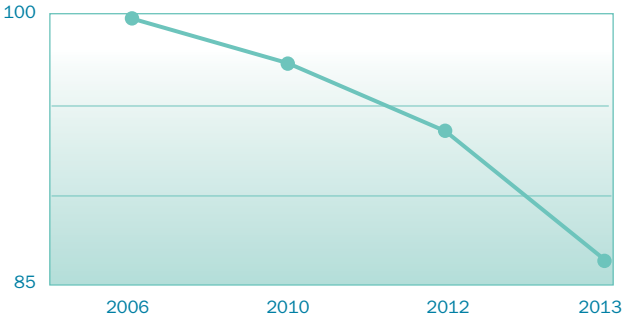
Effluents and waste were defined as material and reportable based on both internal company priority and stakeholder priority. Our manufacturing locations generate sanitary and process wastewater streams, and solid and hazardous solid wastes. These discharges and wastes are controlled by government-issued permits and regulations. Monitoring and reporting of effluent discharges and waste management activities occur at various frequencies and are tracked by internal and external groups. Wastes tracked from mining operations include overburden, tailings and other materials.

Effluent and waste minimization strategies are sought and implemented when feasible.

Since 2006, minimization programs have resulted in approximately 13% reduction in wastewater discharge, and approximately 5% reduction in solid waste generation. Additional reduction targets will be set in 2015.

Waste Water Per Tonne of Product* TiO_2 Plants

2006 = 100

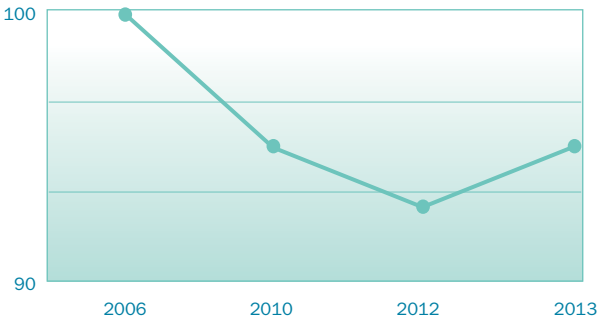


*TiO_2 and co-products sold

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

Solid Waste Per Tonne of Product* TiO_2 Plants

2006 = 100



*TiO_2 and co-products

Data limitation: For this reporting period, calendar year 2013, information relating to this indicator was only available for our TiO_2 manufacturing sites. These locations represent over 90% of our economic value generation.

Wastewater at Ashtabula complex is treated prior to discharge.

Solid waste at Bunbury has been reduced by 40% since 1989.

Cristal has been active in finding ways to reuse solid waste in order to reduce our footprint and promote a positive impact from our plants. In Yanbu, KSA, solid waste has been used to displace new construction materials for roads, backfilling of project expansion sites, and in producing cement products for car parks and barriers. Cristal has also diverted more than 20,000 tons of waste silica sand from landfill by making high purity sodium silicate and dry silica for market use. Cristal's Australia plant is looking to use solid waste in road applications as a sub-grade instead of new construction material. Up to 30% waste can be used in these applications thereby reducing our waste from our plants.

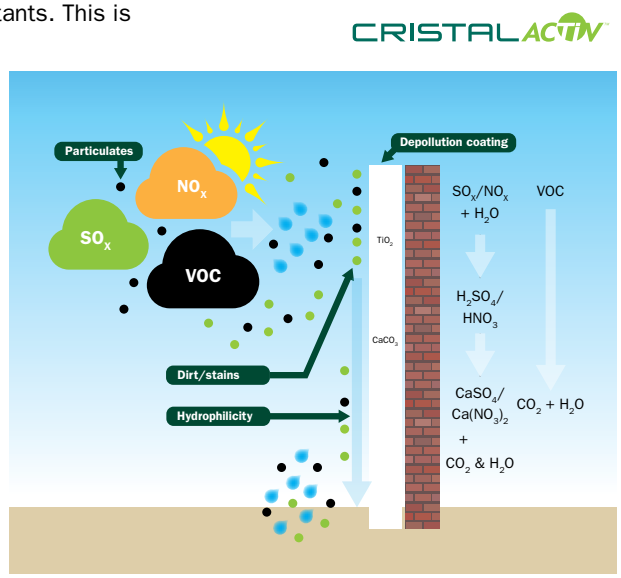
Cristal conducts a trial to recycle waste solids for cement applications.

16 Products and Services

This aspect was not defined as material in the Materiality Assessment conducted in August, 2014 that included a broad cross-section of company and external perspectives. However, the authors of this report believe readers would be interested in Cristal's activities in this. Use of our core TiO_2 products contributes to direct environmental benefits through air and water treatment, and to indirect benefits by reducing energy required to light and cool structures.

A specialized TiO_2 product developed by Cristal, called CristalACTiV™, acts as a catalyst to destroy air pollutants including oxides of nitrogen (NO_x), oxides of sulfur (SO_x) and volatile organic compounds (VOCs). These pollutants are responsible for a range of environmental problems including smog, acid rain, and ground-level (tropospheric) ozone, which cause negative human respiratory and immune system effects.

By incorporating CristalACTiV™ into paints or by direct addition to surfaces in and around areas where pollution is generated, such as car parks, road surfaces, and urban areas or where people congregate and interact such as playgrounds, office buildings, and homes, the treated surface, when exposed to UV light such as sunlight, can break down air pollutants. This is particularly helpful in urban areas where this treatment method does not require additional energy or chemicals, and is relatively low-cost compared to other technologies. CristalACTiV™ can also be used in areas such as tunnels where, if illuminated with ultraviolet (UV) light, the photocatalyst can help remove NO_x that is built up as motor vehicles pass through the tunnel. CristalACTiV™ converts the pollutants into harmless reaction products that wash off with rain or during regular cleaning of surfaces, exposing a fresh surface for continued depollutant treatment. Thanks to the functionality of a photocatalytic surface, normal maintenance is required less often, representing a significant cost savings as well as a tangible reduction of the paints and cleaning chemicals normally used in these activities.



At present, CristalACTiV™ products are widely used globally to eliminate the emissions of pollutants during the combustion of coal and other fossil fuels to produce electrical power. CristalACTiV™ DeNOx catalysts are shaped and installed into the flue gas stream of the power plant where they reduce oxides of nitrogen to N_2 (nitrogen), which makes up 78% of our atmosphere and is harmless, and water. The nitrogen reaction takes place with a conversion efficiency above 95%. It is estimated that this technology has removed just above 90,000 kt of NOx since its inception as a DeNOx catalyst for power plants. Cristal products are estimated to have contributed 23% of the total amount removed.

CristalACTiV™ products are also used to reduce NO_x emissions from diesel burning vehicles such as trucks and buses. The product is also being developed to support country strategies to reduce pollution of off-road sources, such as trains and construction equipment, and of marine sources, such as large ocean-going vessels that burn diesel fuel. In addition to conducting internal research, Cristal has participated in external research on the topic of photocatalytic paints. A recent project[1] studying NO_x removal using several types of photocatalytic materials found the best paint formulation incorporated CristalACTiV™ PC500 photocatalyst. Other studies have been performed on car parks and rail station near Manila and London, with similar results. More information is available at *http://www.cristalactiv.com.*

[1] Highly active photocatalytic paint for NOx abatement under real-outdoor conditions, Mendez, A. et al, Applied Catalysis A: General 01/2014; 484:17–25

The reflectivity of Cristal TiONA® pigments is also used in cool roof applications to reduce the urban heat island (UHI) effect in cities and to reduce energy consumption – and carbon footprint – while cooling buildings. The physics of TiO_2 in the electromagnetic spectrum can be put to work every day to improve energy efficiency and reduce environmental impact in a number of ways, including:

- cooling buildings as one of the world's most effective reflectors of infra-red (IR) radiation from the sun;
- decreasing the use of energy for lighting as one of the world's most efficient reflectors of visible light;
- protecting people and materials from the sun as one of the world's most effective absorbers of UV radiation.

There is a direct relationship between the reflectivity of a building's interior and the energy required to illuminate to a set brightness. More than half of all TiO_2 pigment consumed is used in coatings for interior walls, ceiling, doors and trim. TiO_2 is an extremely efficient reflector of visible light and used in white (untinted) decorative wall paint will reflect up to 90% of emitted light from a typical electric light bulb. Darker colored interiors may have a reflectivity as low as 30%. Lighter colors will make the most of available natural and artificial light, reducing the time artificial light is needed and the wattage necessary to illuminate the space. Laboratory experiments were conducted to understand the impact of TiO_2 loadings in interior paints, and to assess the carbon footprint balance. Results showed that increasing the reflectivity of walls from 40% to 80% equated to an energy saving of 24kgs of CO_2e/year, offsetting the CO_2 emission of producing the TiO_2 in just three days, and providing that benefit for roughly 10 more years.

White (cool) roofs coated with TiO_2-containing paints reduce urban heat island effects and offset the carbon footprint of the TiO_2 used by a factor of more than 600 times.

White roofs (often referred to as cool roofs) are highly efficient infrared reflectors. The benefits of this type of roof are gaining recognition. New environmental regulations are requiring the use of white roofs to passively cool commercial and domestic buildings, which reduces energy consumption by air conditioning systems by up to 20%. In temperate and tropical climates, more white and light colored roofs coated with TiO_2 would contribute significantly to CO_2e reductions. In addition to the energy savings from white roofs and reducing the adverse effects of UHI, white roofs on buildings and cars increase the Earth's albedo (a measure of the reflectivity of a surface). It is estimated that the albedo effect of painting $1m^2$ (requiring approximately 30g of $TiO_2 \approx 160g$ of CO_2e) of commercial/residential roofing white would be equivalent to a one time off-set of 100kgs of CO_2 emissions from the atmosphere.

17 Environmental Compliance

Environmental compliance was defined as material and reportable based on both internal company priority and stakeholder priority. 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 2013.

18 Supplier Assessment

This aspect was not defined as material in the Materiality Assessment conducted in August 2014 that included a broad cross-section of company and external perspectives. However, the authors of this report believe that Cristal's activities in this area would be of interest to readers.

We initiated an assessment program, to be completed during 2015, that focuses on the top suppliers that account for approximately 80% of total expenditures. These key suppliers span the inputs of raw materials, manufacturing materials, energy and transportation services. They will be assessed for environmental, human rights, labor practices, and impacts on society.

To be a good neighbor to rapidly increasing residential developments, our Wonnerup mine site near Bunbury, West Australia has implemented extensive noise and environmental impact measures. Key activities include noise control measures, including:

- Construction of 8.5m tall noise bunds
- Restricted machinery operation hours
- Reduced sound level of machinery
- Sophisticated noise monitoring networks

Noise control structures at Wonnerup

Dust controls include watering, reduced heavy machinery use in adverse weather and hydro-mulching for quick revegetation.

All water discharged from the site is treated prior to discharge, with daily water monitoring.

Water discharge from the Wonnerup mine site is treated and monitored.

Biodiversity rehabilitation includes creation of artificial nesting hollows and feral animal control to protect species of conservation significance, like the black cockatoos and the western ringtail possum.

Black cockatoos are protected by Wonnerup mine site restoration.

19 Employment

Employment was defined as material and reportable based on both internal company priority and stakeholder priority. Our workforce is the key to our success in all areas. Cristal is an ambitious 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. We respect our people and hold ourselves accountable for our actions. This helps us build valued relationships throughout our business and beyond. Both 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.

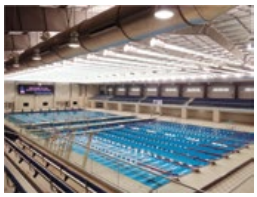
Cristal employs approximately 4,500 people worldwide. Specific site information on employment including contractors, payroll, expenditures on supplies and construction, tax payments and other information can be found at *http://www.cristal.com/about-us/Pages/site-locations.aspx*

Cristal Bahia Awarded Best Employer

(Left) Ronaldo Alcantara (left), Director-Brazil Site, receives the Você S/A Guide award for Cristal Pigmentos do Brasil. Cristal Pigmentos do Brasil has a plant in Bahia State and a commercial office in São Paulo State.

Helping Our Employees Lead Healthier Lives

Our Ashtabula, Ohio complex partnered with the SPIRE Institute in Geneva, Ohio, USA, one of the largest indoor Olympic-grade, multi-sport club, league, event, camp and academy complexes in the world. The goal is to ensure that our employees and the community in Ashtabula have access to the best facilities to help them be fit and healthy.



Our Ashtabula physician performs wellness checks for employees upon request.

20 Labor/Management Relations

Labor/management relations were defined as material and reportable based on both internal company priority and stakeholder priority. The application of our policies and implementation of our mission and vision occurs at the worker level and the relationship between workers and managers is fundamental to our success. This applies whether or not workers are represented by collective bargaining agreement which are in place at certain of our sites.

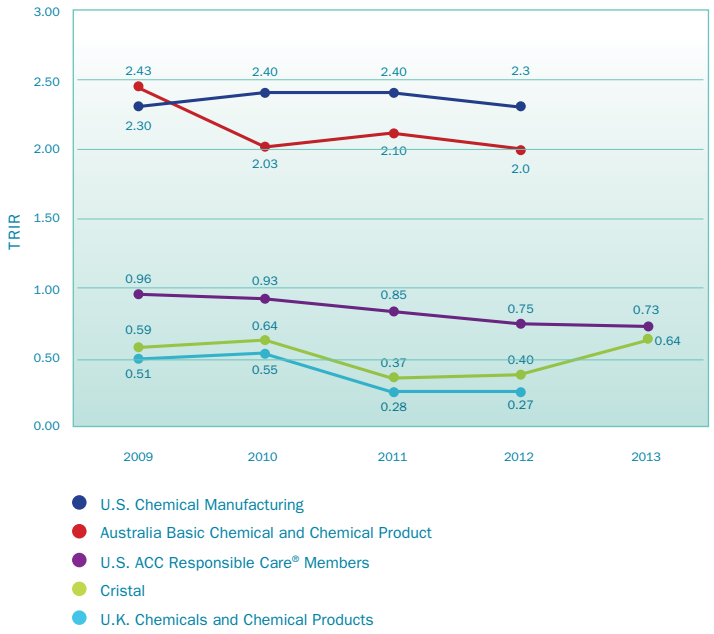
No strikes or lock-outs occurred at any Cristal location in 2013.

Cristal executives at a workshop in Jeddah, Saudi Arabia to define our Journey to Zero, an initiative to create a world-class safety culture throughout Cristal.

21 Occupational Health and Safety

Occupational health and safety was defined as material and reportable based on both internal company priority and stakeholder priority. In fact, it was the highest priority aspect. Cristal recognized the importance of this aspect of our operations long before preparing this report, and has had an aggressive management process and a goal of creating a world-class safety culture. Performance is continually monitored. Incidents, including near misses, are reported promptly at the location where they occur. Immediate corrective action is taken, and incidents are investigated. The corrective action process includes follow-up to ensure effectiveness of the action. Information about the incident, root cause, and corrective action are reported to succeeding levels of management up to the Steering Body level at routine frequencies. Incident rates are monitored and reported. Trends are assessed and broader health and safety performance improvement initiatives are created and implemented as needed. Safety programs at our mines include the elements contained in ILO (United Nations International Labor Organization) Convention 176 on health and safety in mines.

Comparative Safety Performance



While our TRIR for 2013 was elevated above our prior year performance, and included one employee and one contractor fatality, results for 2014 to date prior to creation of this report have shown a return to the downward trajectory we have achieved since 2010. We have one of the best safety records in the industry based on BLS[1] and WHO[2] data for mining and manufacturing companies.

[1] BLS – United States Department of Labor: Bureau of Labor Statistics *http://www.bls.gov/data/*

[2] WHO – World Health Organization *http://www.who.int/en/*

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. The TRIR is calculated by multiplying the number of recordable injuries in a calendar year by 200,000 (which represents 100 employees working 2,000 hours per year) then dividing this value by the total man-hours actually worked in the year.

Many Cristal operations have voluntary programs that result in more efficient and effective safety, health and environmental systems. These include ISO 14001 Environmental Management Systems, and OHSAS 18001 Health and Safety Management Systems. Additionally, our Cristal Mineração do Brasil (Paraíba Mine) has a certified Social Responsibility Management System (under NBR 16001).

Cristal facilities, including the Ashtabula Complex shown here, have safety programs in place to control all relevant hazards.

Workers at Bahia stretch out, strengthen and relax the body. Work gymnastics aim at keeping plant and field staff well prepared for their daily activities. The activities are oriented and supervised by a physical therapy or physical education professional. Since it is a short workout, (10 or 15 minutes) performed during the first hour of the working day, all can participate.

In 2013, Cristal inaugurated the Brilliance Awards to recognize the outstanding accomplishments of employees around the world and their contributions to the company's vision, mission, values and strategic pillars.

Global Safety Improvement Awards were given for three 2013 projects:

- Developing and implementing Process Safety Performance Indicators (PSPIs): The team won for improving systems to ensure Process Safety by developing a comprehensive suite of PSPIs to effectively measure process safety in a manner that is consistent with other business management tools.
- Preventing process leaks: The group developed a system to provide a clearer and unambiguous link between the existing fluid matrix and piping/equipment specifications. The system minimizes the overall risk of exposing people and the environment to hazardous chemicals.
- Multidirectional internal cleaning of $TiCl_4$-contaminated vessels: The team improved the procedure to ensure zero emissions during the process of cleaning a $TiCl_4$ spray condenser and its dip tube.

22 Training and Education

Training and education was defined as material and reportable based on both internal company priority and stakeholder priority. Workforce development is an area of strategic importance to Cristal, and we have developed an internal education center, Cristal Academy, to deliver training to our employees. Employees at all levels and locations have access to Cristal Academy programs. Company-wide, an average of 83.5 hours of training per employee was provided in 2013. This includes training on safety, environmental and health protection topics and workplace and personal development training. Much of the training is delivered through the Cristal Academy.

Effectiveness of individual programs is assessed through evaluations. Overall effectiveness of the academy is assessed by its leadership and reported periodically to the Steering Body.

Cristal's CEO, Dr. Talal Al-Shair, launched the Cristal Academy in July 2012. Its aim is to increase transfer of knowledge, build capability, and improve performance. Within the first year of the Academy's inception (end of June 2012 to end of June 2013), the organization increased the percentage of time that employees spend in development-focused training by 45%. 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 six is now spent on development activity. Prior to the inception of the Academy, it was approximately one in 12. Actual development hours per employee rose from 4.8 hours to seven hours over this time period. Additionally, delivery efficiency increased, driving training dollars per hour cost down 20% year on year.

A sustained focus on employee development is fast becoming part of the fabric of Cristal's culture. Supervisors and above in the organization receive a documented annual performance and career development review. The majority of those employees also receive a mid-year review, which focuses predominately on future-forward action and development. For 2013, the spend per employee on training was $1,617.

Academy

23 Diversity and Equal Opportunity

We believe that the diversity of our multinational organization makes us stronger. Not only can local market knowledge inform our global operations, but the diverse and varied backgrounds of our people can bring about innovative ways of thinking, spark new ideas and make our business more effective.

We value and respect the differences of every single employee and are committed to recruiting and developing the very best talent. We actively promote equality of opportunity throughout our business. These principles of fairness inform everything we do and, as a result, employees can expect to be recognized and rewarded based on their individual talents and contribution.

Cristal Research Center, Baltimore, Maryland USA employees

24 Local Communities

Local communities was defined as material and reportable based on both internal company priority and stakeholder priority. At all locations, we have In Touch teams, led by local employees, who connect with the surrounding communities around issues of importance to that community. Activities are chosen through a structured process that results in action plan definition and implementation. Local teams are supported by regional leaders. The overall program sponsor is Dr. Talal Al-Shair, Cristal's Chairman and CEO.

Cristal "In Touch" programs at each location focus on what matters to that community.

The In Touch teams focus on engagement with our employees, families and communities. Most Cristal operations have consistently run and developed programs that help not only our employees but also our broader community for many years. Those efforts were consolidated under the "In Touch" program.

The program works in four stages: create teams, identify gaps/needs, program action plan, and program launch and implementation.

Some of the areas "In Touch" covers are:

- Engagement of families
- Team building and competitions
- Safety
- Management practices
- Employee suggestions
- Employee benefits and recognition
- Communication
- Talent development
- Office and work conditions
- Social work and community engagement

In Touch Programs

In Touch programs that include community engagement are in place at 100% of our locations. Specific programs depend on the size, nature, complexity and market presence of our operations.

Facilities with potential environmental impact, such as mining and manufacturing, include environmental issues in their community engagement efforts. Many specifically include educational support programs, particularly focusing on science, technology, engineering and mathematics (STEM) and environmental and safety fields.

At mining locations, we also involve the local communities and relevant agencies in activities to preserve biodiversity and rehabilitate surrounding land. Other operational coordination with local community permitting authorities occurs routinely as part of SHE and other functional duties. In addition, our SHE Policy expressly includes a commitment to community service to actively participate in communities and support our employees' efforts to positively impact the quality of life locally and beyond.

One of the Cristal Mineração do Brasil initiatives that supports the local community is the Environmental Education Program for teachers and students.

Cristal's Paraíba Environmental Education Program

In 2013, the Environmental Education Program received 528 students and 25 teachers from areas of direct influence by the operation.

Le Havre Site Closure

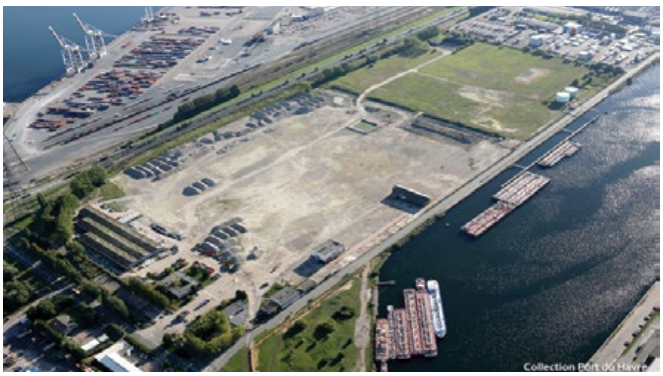
Cristal is committed to sustainability and good community relations even when closing sites. The Le Havre TiO_2 manufacturing site ceased operations in 2007. The first photo below shows the site prior to closure.

Since the closure announcement, Cristal has worked closely with the Le Havre port authority (GPMH), regulatory agencies and other interested parties to return the site to an acceptable condition to return to the GPHM for alternative use. By late 2014 most of the site buildings will have been dismantled and removed. Cristal developed effective methods to address several contamination issues at the site, including clean up and removal of naturally occurring radioactive material (NORM), sulfate soil contamination, an on-site creek and other areas so materials could be safely collected for proper disposal.

In addition, a large amount of non-hazardous material was removed from the site for proper disposal or recycling. This material included:

- More than 100,000 tonnes of concrete
- 27,500 tonnes of iron and other metals
- 14,550 tonnes of general waste

Cristal is now working with the GPMH to return all of the site property to the Port within 2015. The second photo below was taken in late 2014.



25 Anti-corruption

Anti-corruption was defined as material and reportable based on both internal company priority and stakeholder priority. Numerous Cristal policies formally reinforce the expectation that all employees lead by being exemplary in conduct and give specific guidance for avoiding potential situations of concern. Corporate performance against these requirements is monitored by the Legal department. If any issues arise, they are managed through leadership levels as appropriate, including elevation to the Steering Body, if needed.

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 training board members and employees in its anti-corruption policies and procedures. This training is accomplished, depending upon the intended audience, via in-person or online training. There have been no confirmed incidents of corruption during the reporting period.

26 Anti-competitive Behavior

This aspect was not defined as material in the Materiality Assessment conducted in August 2014 that included a broad cross-section of company and external perspectives. However, the authors believe that Cristal's activities in this area would be of interest to readers.

Cristal has policies and procedures in place pertaining to anti-competitive behavior. For the reporting period, Cristal's United States entity was involved in three legal actions relating to allegations of anti-competitive behavior. Cristal denies any liability and is vehemently defending itself in these actions.

27 Compliance

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal activities in this area would be of interest to readers.

No non-compliances with laws and regulations relating to provision and use of products or services were identified during 2013.

28 Emergency Preparedness

Emergency Preparedness was defined as material and reportable based on both internal company priority and stakeholder priority. While it is a GRI aspect only for the mines, it is a key activity for locations throughout Cristal, including manufacturing and non-manufacturing sites. Our SHE policy includes as a priority the implementation of the principles of risk analysis and risk management in all areas of safety, health and environmental protection. Emergency preparedness is an essential component of our risk management strategies. Our activities extend beyond our fence lines and include coordination with local communities, particularly first responders, to ensure that any response is accomplished efficiently and effectively. Periodic drills and procedure reviews are conducted. Any deficiencies noted are corrected.

All manufacturing facilities and mines have emergency response plans.

Protecting the Community

Cristal is also an active supporter of the United Way, and participant in the LaSalle-Peru Community Advisory Panel, which brings together representatives from many sectors of the local community to focus on chemical safety. Activities have included coordination with local fire and police departments, and teaming with schools, including the Illinois Valley Community College. Cristal was recognized with the 2010 Business Leadership Award from NCI Works, an organization responsible for planning and coordinating the communities' resources into a workforce development system.

Emergency response training at Stallingborough plant

Emergency response training takes place at all of our TiO_2 plants on a regular basis. In Stallingborough, all five site ER teams (51 members) attended a three-day residential course at Washington Hall International Training & Development Center, which is run by UK Lancashire County Fire and Rescue Service. The course covered:

- Fire fighting
- Search and rescue
- Confined space rescue
- Chemical spills
- Decontamination drills

Emergency response training drill at Yanbu

29 Mine Closure Planning

Closure Planning was defined as material and reportable based on both internal company priority and stakeholder priority for the mines. Potential impacts on the workforce, wider community and environment associated with mine closure are identified. Action plans, including rehabilitation strategies at several stages in the mine life cycle, are created and include formal closure plans. Plans also include provisions for post-closure monitoring and revision, if indicated.

Mine closure plans are in place for all of our mines except one, where the closure plan is under development. For new operations, the closure plan is defined before development begins as part of the operation plan and is reviewed and updated every five years.

The closure plans address any legal requirements plus the unique environmental, economic and social properties of the operation. Outlined below are the typical contents of a closure plan, which will vary depending on individual circumstances. In developing the closure plan, the following four key objectives are kept in mind:

- to protect the environment and public health and safety by using safe and responsible closure practices;
- to reduce or eliminate environmental effects once the mine ceases operations;
- to establish conditions that are consistent with the pre-determined end land use objectives; and
- to reduce the need for long-term monitoring of physical and chemical stability of disturbed areas.

Closure plans contain key information, including:

- summary of project
- key stakeholders
- closure data, including existing baseline data
- post-mining land use objectives
- completion criteria
- closure implementation, monitoring and maintenance reporting.

Rehabilitation trial area adjacent to the former Wemen Mine including ten-year-old Chenopod and Mallee Eucalypt revegetation.

Paraíba, Brazil

Before (1993) and after (2013) restoration at Paraíba mine

The vegetation nursery for rehabilitation of Paraíba mine currently supplies over 85,000 seedlings/yr from 180 species.

30 Customer Health and Safety

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal's activities in this area would be of interest to readers.

Since the early 1990s, Cristal Thann has provided specialized training on handling titanium tetrachloride ($TiCl_4$). This training is provided to our $TiCl_4$ customers, our personnel, our contractors, the logistics teams, the local external fire brigades and police and gendarmerie forces. The training includes a visit to our $TiCl_4$ storage area and covers the risks presented by the product and what can be done in case of an emergency involving this product. An average of six training sessions per year are performed at the Thann site. These sessions are typically provided in French, German and English language, and occasionally in Italian and Spanish. Since the early 2000s, this $TiCl_4$ safety training has also been provided at the Ashtabula site and also at customers' sites.

Specialized customer safety training is conducted internationally by Jean-Marc Bubel.

Attendees at a titanium tetrachloride safety training in autumn 2013

31 Product and Service Labeling

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal's activities in this area would be of interest to readers.

Safe use instructions and labels are provided for all our products as required by regulations, and proactively for some products that would not be required to include this information. Generally, this is available in a safety data sheet (SDS). We are currently updating SDSs and labels to reflect the Globally Harmonized System (GHS) of classification and labeling of chemicals.

32 Marketing Communications

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal's activities in this area would be of interest to readers.

Our product regulatory compliance process includes identification of market bans and stakeholder concerns.

We do not sell banned products. None of our products contain substances that have been identified for the candidate list of substances of very high concern (SVHC) under the EU REACH regulation. Furthermore, we do not expect our substances will be listed on future versions of the SVHC candidate list.

In 2013, one instance of a potential non-compliance with a country listing was identified. Options were researched and corrective action was taken in 2014.

A detailed review of all relevant toxicological data done as part of the registration under the EU REACH regulation, for the manufacture and use of CristalACTiV™ ultrafine TiO_2 in the end uses currently approved by Cristal, concluded it is non-hazardous according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)[1] criteria.

Recently, questions have arisen about the safety of nanomaterials (materials containing a certain proportion – depending on various definitions – of particles with at least one dimension in the 1 to 100 nanometers (nm) size range). Such materials include the ultrafine TiO_2 CristalACTiV™ products. Cristal has supported work through the Titanium Dioxide Manufacturers Association (TDMA) to understand and respond to these questions in an ethical and scientifically sound manner. Full details are available at the TDMA website: *http://www.tdma.info*.

In recent years, a number of publications have linked potentially adverse effects to exposure to ultrafine TiO_2. Most such studies employ unconventional testing methods and suffer from a number of other deficiencies including the inappropriate use of large or exaggerated particle doses that have little or no relevance to human exposures; absence of appropriate positive and negative controls; and failures to demonstrate dose-response relationships.

[1] *http://www.unece.org/trans/danger/publi/ghs/implementation_e.html#c25812*

What are Ultrafine and Pigmentary TiO_2?

Pigment grade TiO_2 is manufactured to optimize the scattering of visible light, which requires primary particles in the size range of approximately half the wavelength of the visible light. Ultrafine TiO_2 is engineered to have primary particles in the nanoparticle size range, that is, 1 to 100 nm. Accordingly, the scattering of visible light is significantly reduced and the TiO_2 nanoparticles are transparent. Transparency and other properties related to this size provide different beneficial properties from those seen for the pigmentary product.

Ultrafine TiO_2 has been used since the 1980s to reduce the environmental emissions of nitrogen oxides. It is used in selective catalytic reduction (SCR) systems that convert nitrogen oxides into harmless nitrogen and water. Commercial SCR systems are typically installed in large industrial boilers, combustion plants and stationary or automotive diesel engines.

Although ultrafine TiO_2 is comprised of primary particles in the nano size range, an inherent property of ultrafine TiO_2 is that the primary particles are strongly bound or fused together by chemical bonds to form aggregates. These aggregates readily agglomerate to form particles in the micrometer size range. The TDMA and Titanium Dioxide Stewardship Council have published a fact sheet (available at *http://www.tdma.info/about-tio2.html*), which contains further information. TiO_2 is ubiquitous in our society and is used in most surfaces and articles that are white in color. Since the introduction of TiO_2 as a commercial product in 1923, there have been no identified health concerns associated with exposure among consumers or the general population.

These facts are supported by the results from four large epidemiology studies involving more than 20,000 workers in the titanium dioxide manufacturing industry in North America and Europe, which indicate no association with an increased risk of cancer or with any other adverse lung effects (These studies did not specifically differentiate between ultrafine and pigmentary TiO_2).

In 2006, the International Agency for Research on Cancer (IARC) evaluated TiO_2 as possibly carcinogenic to humans (Group 2B) based primarily on studies in rats. Inhalation exposures to TiO_2 in rats can result in lung effects and lung tumors. However, it is generally recognized that the rat is uniquely sensitive to the effects of "lung overload" which is not observed in other species including humans. Further information is available at *http://www.tdma.info/about-tio2.html*.

Are there human health concerns with ultrafine TiO_2?

Based on all of the data collected to date, ultrafine TiO_2 manufactured by Cristal and sold for current end uses approved by Cristal is considered to be safe if the advice and guidance contained in our safety data sheets (SDS) is followed.

Ultrafine forms of TiO_2 are not classified in the European Union under either the Dangerous Substance Directive (EU Directive 67/548/EEC) or the more recent Classification Labeling and Packaging (CLP) Regulation (EC) 1272/2008).

Evidence available at this time supports the safe manufacture and use of ultrafine TiO_2 in current applications.

Are there environmental concerns with ultrafine TiO_2?

Available information for ultrafine TiO_2 indicates a low concern for environmental effects. Well-conducted studies following recognized international protocols indicate a low level of acute aquatic toxicity for ultrafine TiO_2. Some few recent studies have reported chronic toxicity effects for ultrafine TiO_2 in the aquatic environment. Given the insoluble nature of ultrafine TiO_2, and its tendency to agglomerate and adhere to other particulates, the relevance of such studies, conducted in pure water and without the presence of sediment, is questionable.

What product stewardship measures are employed by Cristal for ultrafine TiO_2?

As part of Cristal's continuing commitment to product excellence, teams of experts conduct in-depth risk assessments of new and existing products. Cristal also plays leadership roles in industry associations such as the European Titanium Dioxide Manufacturers' Association and the North American Titanium Dioxide Stewardship Council, with the goal of developing and sharing best practice on the safe use and sustainability of ultrafine TiO_2 products.

Cristal is participating in the Organisation for Economic Cooperation and Development (OECD) Working Party on Manufactured Nanomaterials (WPMN) which was established in 2006. Work from this program continues with a number of advances recorded including the review and validation of appropriate testing methodologies and the development of appropriate analytical methodologies allowing accurate characterization and measurement of the nanomaterials in the test systems. It is hoped that such results will help direct future efforts for product characterization and for hazard and risk characterization of ultrafine TiO_2.

Conclusions

Well conducted studies in animals employing routes of exposure and exposure levels relevant to human exposures, as well as large epidemiology studies conducted in exposed workers, indicate a low level of concern for ultrafine TiO_2 exposures. Cristal safely produces ultrafine TiO_2 and sells ultrafine products only into select applications intended for industrial use.

We encourage interested persons to review the full details at the TDMA website, and to contact us at *sustainability@cristal.com* if further information would be helpful to you.

33 Product Regulatory Compliance

Product regulatory compliance was defined as material and reportable based on both internal company priority and stakeholder priority. Many Cristal products are regulated through chemical safety, transportation safety and other programs at national and international levels. We have a sophisticated product regulatory compliance system in place to address these requirements. It is back-integrated into our research and development processes, and includes a periodic reevaluation based on risks of each product line. Improvements are defined and implemented as needed.

Information about our product regulatory compliance program is available at *http://www.cristal.com/safety-health-and-environment/Pages/product-stewardship.aspx*.

We provide safety data sheets (SDSs) for all products, including those that are not classified as hazardous, and for which there may not be a regulatory requirement. In addition to SDSs, we provide information about safe use in regulated applications such as food packaging, and provide timely responses to customer inquiries about the purity of our products and compliance with regulations relevant to the customer and end use.

As part of Cristal's continuing commitment to product excellence, teams of experts conduct in-depth risk assessments of new and existing products. Cristal also plays leadership roles in industry associations such as the European Titanium Dioxide Manufacturers' Association and the North American Titanium Dioxide Stewardship Council, with the goal of developing and sharing best practices on the safe use and sustainability of all of our products and co-products.

34 Materials Stewardship

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal's activities in this area would be of interest to readers.

While materials stewardship is a GRI Metals and Mining Sector Supplement Indicator, we believe that it relates broadly to the entire life cycle of titanium, including our TiO_2 and other products. Other sections of this report have described our efforts to conserve raw materials, feedstocks, chemicals, water, electricity and other inputs through more efficient use. We have also discussed how use of our products:

- Reduces air and water pollutants through catalytic action
- Minimizes energy use in lighting and cooling structures, which are estimated to account for roughly 41% of primary energy consumption in the U.S.,[1] with its attendant carbon footprint
- Contributes to extending useful life of materials used outdoors, thereby minimizing waste and life-cycle impacts, by protecting them from sun damage through UV absorbance and IR reflection

In total, our activities demonstrate responsible materials stewardship throughout mining, production and use of our titanium source minerals.

[1] *http://buildingsdatabook.eren.doe.gov/*

JAZAN SMELTER

Cristal is embarking on a massive project to process ilmenite, an ore that contains both titanium and iron, and create high-grade slag for use as a TiO_2 feedstock and coproduct pig iron for production of steel. The Gulf region's first ilmenite processing plant for producing high-grade titanium slag used in the production of titanium dioxide is to be set up by Cristal at Jazan Economic City (JEC) in southwest Saudi Arabia.

The slag will be processed to between 85% and 90% TiO_2 content in JEC for use in producing titanium dioxide products at our plants around the globe. In its first stage, Cristal's JEC ilmenite smelter will produce 500,000 tonnes of high purity ilmenite slag and 235,000 tonnes of high purity pig iron (HPPI) as a co-product, which will go to the steel mills of Saudi Arabia, another first for the Kingdom.

According to Dr. Talal Al-Shair, chairman and CEO of Cristal, the Jazan smelter will go on stream in 2015 and will the first of its kind in Saudi Arabia. The smelter's production capacity can be doubled to one million tonnes and the supply will go to the local market for the first time. Moreover, the output will be very competitive at a time of international shortage in high-grade titanium dioxide ore.

Cristal's ilmenite smelter in Jazan Economic City, Saudi Arabia

The Cristal smelter will support sustainability in a number of ways. Over 300 jobs will be created over the next few years due to the creation of this facility. The use of new and improved technology will result in a facility that is energy efficient compared to other ilmenite smelters.

Two 64 MW AC-furnaces will be used at the Cristal smelter site. AC-furnaces have lower energy consumption and a higher uptime than DC-furnaces, so the smelter will be intrinsically more energy efficient and result in a reduced carbon footprint.

The normal process in current ilmenite smelters is to cast the slag in ladles, wait until it has solidified, and then to crush it to correct particle size. This consumes a significant amount of energy, as the process requires vehicles, crushing, grinding etc. The new technique used at the Cristal smelter is a lot more cost effective and energy efficient. Furthermore, it saves water compared to normal ingot cooling.

The site is being built by a third party to EU standards that require highly effective emissions control systems to minimize environmental impacts due to airborne emissions. The site is also planned to recycle all water with zero discharge from the site. In addition, very little hazardous waste will be produced.

DYESOL PHOTOVOLTAICS

Through our parent company Tasnee, we are supporting development of cleaner, brighter technologies by Dyesol Australia, a third generation photovoltaics company. Dyesol is actively engaged in designing and developing the latest low cost photovoltaic cells, which can replace the first generation silicon and second generation cadmium telluride and cadmium indium gallium selenide (CIGS) cells, which are much more expensive to produce. These third generation cells use inorganic materials produced by Cristal and have very recently achieved efficiencies very close to the best silicon cells. They have the added advantage that they can be produced by low cost printing technologies, such as slot die or screen printing. This saves on expensive thermal processing, which makes up a large part of the cost of producing 1st and 2nd generation cells. This is expected to lead to lower cost sustainable energy for all. The new cells are also more effective in the northern hemisphere and over more daylight hours than silicon.

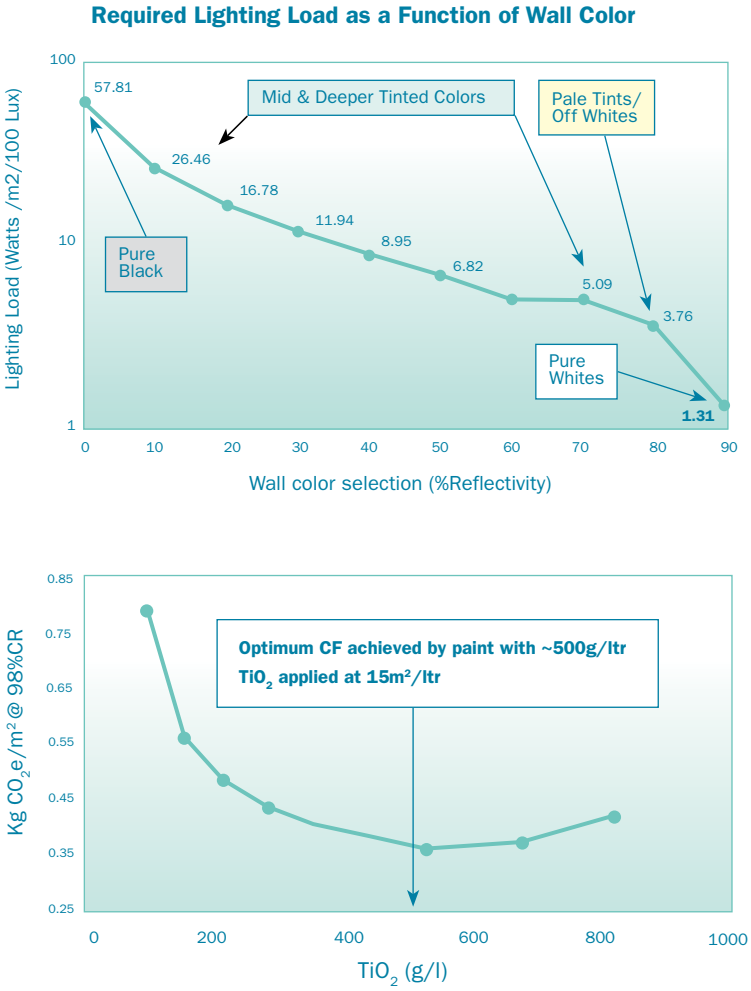
35 Sustainable Consumption

This aspect was not defined as material in the Materiality Assessment conducted in August 2014, however, the authors believe that Cristal's activities in this area would be of interest to readers.

Cristal has encouraged industry-wide efforts through the Titanium Dioxide Manufacturer's Association (TDMA) to conduct product carbon footprint and life-cycle assessments for TiO_2 following the EU Product Environmental Footprint (PEF)[1] protocol. Results are being used to set internal targets for performance improvement. Cristal's 2013 TiO_2 product carbon footprint is somewhat lower than the TDMA-calculated industry average.

Cristal has actively conducted research to understand optimal titanium dioxide loading in products. Research has shown that while reducing TiO_2 loadings in paint may initially be viewed as a way to reduce the carbon footprint of a coating product, life-cycle assessment indicates that reducing TiO_2 levels almost always has a negative impact on coatings performance. If more paint is needed to complete the paint job or the paint doesn't last as long, then the true carbon footprint is higher than if an optimal TiO_2 loading is used initially. Optimal loadings were defined for key classes of end products.

Cristal researchers have written articles on the topic for widely-read industry publications and discussed findings in key industry conferences.[2]



Alkyd Gloss - Carbon Footprint of Coating 1m² of Surface to 98% Color Reflectance

[1] *http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013H0179*

[2] Presentation "The Impact of TiO_2 Loadings on the Carbon Footprint of Decorative Coatings" M. Binns, European Coatings Congress (ECC) in Nuremberg, Germany, March 2013.

GRI Index Table

GRI G4 ELEMENT	*Materiality, based on assessment conducted in August 2014*
GENERAL STANDARD DISCLOSURES	
STRATEGY AND ANALYSIS	
G4-1	Statement from the most senior decision-maker of the organization about the relevance of sustainability to the organization and the organization's strategy for addressing sustainability
G4-2	Description of key impacts, risks, and opportunities
ORGANIZATIONAL PROFILE	
G4-3	Name of the organization
G4-4	Primary brands, products, and services
G4-5	Location of the organization's headquarters
G4-6	Countries where the organization operates
G4-7	Nature of ownership and legal form
G4-8	Markets served
G4-9	Scale of the organization
G4-10	Employee information
G4-11	Percentage of total employees covered by collective bargaining agreements
G4-12	Organization's supply chain
G4-13	Significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain
G4-14	Whether and how the precautionary approach or principle is addressed by the organization
G4-15	Externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses
G4-16	Memberships in associations
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G4-18	Process for defining the report content and the aspect boundaries
G4-19	Material aspects list
G4-20	Material aspect boundaries within the organization
G4-21	Material aspect boundary outside the organization
G4-22	Restatements of information provided in previous reports
G4-23	Significant changes from previous reporting periods in the scope and aspect boundaries
STAKEHOLDER ENGAGEMENT	
G4-24	Stakeholder groups engaged by the organization
G4-25	Basis for identification and selection of stakeholders with whom to engage
G4-26	Organization's approach to stakeholder engagement
G4-27	Key topics and concerns that have been raised through stakeholder engagement

REPORT PROFILE	
G4-28	Reporting period (such as fiscal or calendar year) for information provided
G4-29	Date of most recent previous report (if any)
G4-30	Reporting cycle (such as annual, biennial)
G4-31	Contact point for questions regarding the report or its contents
G4-32	'In accordance' option chosen
G4-33	Policy and current practice with regard to seeking external assurance for the report
GOVERNANCE	
G4-34	Governance structure of the organization
G4-35	Process for delegating authority for economic, environmental and social topics
G4-36	Executive-level position or positions with responsibility for economic, environmental and social topics
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics
G4-38	Composition of the highest governance body and its committees
G4-39	Chair of the highest governance body
G4-40	Nomination and selection processes for the highest governance body and its committees
G4-41	Processes for the highest governance body to ensure conflicts of interest are avoided and managed
G4-42	Highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts
G4-43	Measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics
G4-44	Processes for evaluation of the highest governance body's performance with respect to governance of economic, environmental and social topics
G4-45	Highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities
G4-46	Highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental and social topics
G4-47	Frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities
G4-48	Highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material aspects are covered
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G4-51	Remuneration policies for the highest governance body and senior executives
G4-52	Process for determining remuneration
G4-53	Stakeholders' views regarding remuneration
G4-54	Compensation ratio
G4-55	Compensation increase ratio
ETHICS AND INTEGRITY	
G4-56	Organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics
G4-57	Internal and external mechanisms for seeking advice on ethical and lawful behavior
G4-58	Internal and external mechanisms for reporting concerns about unethical or unlawful behavior

CATEGORY: ECONOMIC		
ASPECT: ECONOMIC PERFORMANCE		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Economic Performance Indicator	
ASPECT: MARKET PRESENCE		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Market Presence Indicator	
ASPECT: INDIRECT ECONOMIC IMPACTS		**Not Material**
ASPECT: PROCUREMENT PRACTICES		**Not Material**
CATEGORY: ENVIRONMENTAL		
ASPECT: MATERIALS		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Materials Indicator	
ASPECT: ENERGY		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Energy Indicator	
ASPECT: WATER		**Not defined as material, but included in this Report**
	Water indicator	
ASPECT: BIODIVERSITY		**Material for Mines**
G4-DMA	Generic Disclosures on Management Approach	
	Biodiversity Indicator	
ASPECT: EMISSIONS		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Emissions Indicator	
ASPECT: EFFLUENTS AND WASTE		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Effluents and Waste Indicator	
ASPECT: PRODUCTS AND SERVICES		**Not defined as material, but included in this Report**
	Products and Services Indicator	
ASPECT: COMPLIANCE		**Material**
G4-DMA	Generic Disclosures on Management Approach	
G4-EN29	Compliance Indicator	
ASPECT: TRANSPORT		**Not Material**
ASPECT: OVERALL		**Not Material**
ASPECT: SUPPLIER ENVIRONMENTAL ASSESSMENT		**Not defined as material, but included in this Report**
G4-EN32	Supplier Environmental Assessment Indicator	
ASPECT: ENVIRONMENTAL GRIEVANCE MECHANISMS		**Not Material**

CATEGORY: SOCIAL		
SUB-CATEGORY: LABOR PRACTICES AND DECENT WORK		
ASPECT: EMPLOYMENT		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Employment Indicator	
ASPECT: LABOR/MANAGEMENT RELATIONS		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Labor/Management Relations Indicator	
ASPECT: OCCUPATIONAL HEALTH AND SAFETY		**Material**
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	Occupational Health and Safety Indicator	
ASPECT: TRAINING AND EDUCATION		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Training and Education Indicator	
ASPECT: DIVERSITY AND EQUAL OPPORTUNITY		**Not Material**
ASPECT: EQUAL REMUNERATION FOR WOMEN AND MEN		**Not Material**
ASPECT: SUPPLIER ASSESSMENT FOR LABOR PRACTICES		**Not defined as material, but included in this Report**
G4-LA14	Supplier Assessment for Labor Practices Indicator	
ASPECT: LABOR PRACTICES GRIEVANCE MECHANISMS		**Not Material**
SUB-CATEGORY: HUMAN RIGHTS		
ASPECT: INVESTMENT		**Not Material**
ASPECT: NON-DISCRIMINATION		**Not Material**
ASPECT: FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING		**Not Material**
ASPECT: CHILD LABOR		**Not Material**
ASPECT: FORCED OR COMPULSORY LABOR		**Not Material**
ASPECT: SECURITY PRACTICES		**Not Material**
ASPECT: INDIGENOUS RIGHTS		**Not Material**
ASPECT: ASSESSMENT		**Not Material**
ASPECT: SUPPLIER HUMAN RIGHTS ASSESSMENT		**Not defined as material, but included in this Report**
	Supplier Human Rights Assessment Indicator	
ASPECT: HUMAN RIGHTS GRIEVANCE MECHANISMS		**Not Material**
SUB-CATEGORY: SOCIETY		
ASPECT: LOCAL COMMUNITIES		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Local Communities Indicator	
ASPECT: ANTI-CORRUPTION		**Material**
G4-DMA	Generic Disclosures on Management Approach	
G4-SO4	Anti-corruption Indicator	

ASPECT: PUBLIC POLICY		**Not Material**
ASPECT: EMERGENCY PREPAREDNESS		**Material for Mines**
G4-DMA	Generic Disclosures on Management Approach	
	Emergency Preparedness Indicator	
ASPECT: ARTISINAL AND SMALL-SCALE MINING		**Not Material**
ASPECT: RESETTLEMENT		**Not Material**
ASPECT: CLOSURE PLANNING		**Material for Mines**
G4-DMA	Generic Disclosures on Management Approach	
	Closure Planning Indicator	
ASPECT: ANTI-COMPETITIVE BEHAVIOR		**Not defined as material, but included in this Report**
G4-SO7	Anti-competitive Behavior Indicator	
ASPECT: COMPLIANCE		**Not defined as material, but included in this Report**
G4-SO8	Compliance Indicator	
ASPECT: SUPPLIER ASSESSMENT FOR IMPACTS ON SOCIETY		**Not defined as material, but included in this Report**
G4-SO9	Supplier Assessment for Impacts on Society Indicator	
ASPECT: GRIEVANCE MECHANISMS FOR IMPACTS ON SOCIETY		**Not Material**
SUB-CATEGORY: PRODUCT RESPONSIBILITY		
ASPECT: CUSTOMER HEALTH AND SAFETY		**Not defined as material, but included in this Report**
G4-PR1	Customer Health and Safety Indicator	
ASPECT: PRODUCT AND SERVICE LABELING		**Not defined as material, but included in this Report**
	Product and Service Labeling Indicator	
ASPECT: MARKETING COMMUNICATIONS		**Not defined as material, but included in this Report**
	Marketing Communications Indicator	
ASPECT: CUSTOMER PRIVACY		**Not Material**
ASPECT: PRODUCT REGULATORY COMPLIANCE		**Material**
G4-DMA	Generic Disclosures on Management Approach	
	Product Responsibility Compliance Indicator	
ASPECT: MATERIALS STEWARDSHIP		**Not defined as material, but included in this Report**
	Materials Stewardship Indicator	

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