

TASNEE Sustainability Performance Overview

Highlights of Activities Occurring and Data Collected as of March 2018

Issue	TASNEE Corporate	Petrochemicals (TPC)	Titanium Products (Cristal) ¹
Pollution prevention (reducing emission sources)	Pollution prevention is addressed in the TASNEE Environmental, Health, Safety and Security (EHSS) Policy, and implemented at facility level.	<p>TPC Operational and Organizational Excellence Policy includes a commitment to prevention of “any form of pollution.”</p> <p>Best Available Techniques (BAT) analysis is performed during Permit application process to systematically identify and screen pollution prevention options for selection and implementation.</p> <p>Key Performance Indicators (KPIs) are established and tracked to focus on pollution prevention.</p>	<p>Cristal Safety, Health and Environmental (SHE) Commitment includes a focus on resource conservation and pollution prevention.</p> <p>Key Performance Indicators (KPIs) are established and tracked to focus on pollution prevention.</p>
Biodiversity protection measures		<p>Biodiversity protection is addressed as part of facility permitting and permit renewals.</p> <p>Page 18 of the 2016 TASNEE CSR Annual Report http://www.tasnee.com/en/InvestorRelations/AnnualReports/TASNEE_AR_English_2016.pdf mentions the biodiversity protection program in the eastern coast of the Red Sea in Yanbu.</p>	<p>The Cristal SHE Commitment includes a goal to be a recognized leader in rehabilitation of mining sites and discontinued operations around the globe.</p> <p>Biodiversity is one of, if not the major focus for TASNEE mine reclamation operations.</p> <p>TASNEE has received several awards from both governmental agencies as well as local universities for our efforts in restoring the land to better than the original condition for both flora and fauna.</p>
Biodiversity-related indicators			<p>Biodiversity metrics published in the Sustainability Report (pg.8) include</p> <ul style="list-style-type: none"> - Total land disturbed and not yet rehabilitated - Total amount of new land disturbed within reported period - Total amount of land newly rehabilitated within the reporting period to the agreed end use - Total land disturbed and not yet rehabilitated <p>At Cristal mines in Brazil, the</p>

¹ Cristal publishes periodic Sustainability Reports which include many information elements in this table. Rather than include the url in each table entry, please refer to http://www.cristal.com/news-room/Documents/Sustainability_Report_2017.pdf for the 2017 report. The comprehensive Cristal Sustainability Report (http://www.cristal.com/news-room/Documents/Sustainability_Report_Interactive.pdf) contains additional information.

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			surface area of disturbed land was reduced by 22% compared to 2015.
Measures to reduce water use and effluents		Measures are being applied to maximize the water recycling which includes condensate return from plants and evaluation of new waste water recycle project . Controls are in place on wastewater and stormwater discharges, as required by national and local regulations and facility Permits. Wastewater is used for irrigation where possible.	Controls are in place on wastewater and stormwater discharges, as required by national and local regulations and facility Permits.
Data on water use		Marafiq water use intensity reduction is a TPC KPI - monitored monthly.	Data on water consumption is published in the 2017 Sustainability Report on page 8.
Data on water effluents		<p>Process, cooling and storm water effluent data is routinely generated and reported to regulatory agencies. Groundwater is analyzed and reported annually.</p> <ul style="list-style-type: none"> •Wastewater effluent (all sites) daily samples for temperature, ammonia, oil and grease, pH, Total Dissolved Solids (TDS), Total Organic Carbon (TOC), Total Suspended Solids (TSS); reported monthly. • Wastewater effluent (Ethylene and PDH/PP Plants) continuous TOC monitored. •Cooling Water (Ethylene, PDH/PP Plants and U&O) daily samples for temp, ammonia, pH, TOC, TSS; reported monthly. •Groundwater boreholes (all sites) are annually sampled and reported for water level, pH, conductivity, TOC, total petroleum hydrocarbons (TPH) and reported w/in 90 days. •Stormwater (Ethylene and PDH/PP Plants) first flush of every storm event are contained and sampled. 	<p>Data on water discharges is published in Sustainability Reports (pg. 10).</p> <p>Data is routinely generated and reported to regulatory agencies and for internal KPIs. Parameters vary depending on the processes at the facility, and include:</p> <ul style="list-style-type: none"> • Temperature, • Oil & grease • pH • TSS • TOC • TDS • Specific organic and inorganic compounds relating to the particular facility

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		Results determine management method.	
Measures to Reduce Energy Consumption		TPC energy reduction program exists for cost saving, emission reduction, and achievement of Saudi Energy Efficiency Center (SEEC) targets.	Energy intensity is a KPI for all facilities. Specific measures have been implemented depending on the operations at each facility. Energy intensity for pigment plants is at a level considered “best available techniques” by the European Commission.
Data on Energy Consumption		Monthly Energy KPI addresses: <ul style="list-style-type: none"> •Fuels used in utilities •Fuels used in mobile sources •Process stationary combustion Energy •Process Non-Combustion Energy •Indirect Energy Electricity/ Heat/ Steam 	Energy consumption data in absolute and GJ/t of total products is published in the 2017 Sustainability Report on page 7.
Data on renewable energy use		In 2015, TASNEE submitted information to the Saudi Arabian Royal Commission for the application of solar power.	Solar and wind power are used at Cristal titanium mines. The Pariba, Brasil mine also uses sugar cane waste as a fuel. Data on energy from renewable sources is published in the 2017 Sustainability Report on page 7.
Measures to reduce atmospheric emissions related to energy consumption		GHG calculation and reduction priorities consider sources related to energy including: <ul style="list-style-type: none"> •Fuels used in utilities •Fuels used in mobile sources •Process stationary combustion Energy •Indirect emission from purchased Electricity/ Heat/ Steam 	Cristal publishes carbon footprint per KG of product in the Sustainability Report (pg. 9).
Data on emissions of CO₂, SO_x, NO_x		Ethylene Plant Cracking furnaces are stack tested (2 per year with full rotation of furnaces within 4 years). Ethylene Plant Cracking furnaces are equipped with NO _x Continuous Emission Monitors (CEMs) which are summarized and reported monthly (electronically). Ethylene Plant Package boilers (2) are stack tested biannually. PDH/PP Plant uses a control technology called Selective catalytic reduction (SCR) to reduce NO _x ; it is required to	Data on CO ₂ , SO _x , NO _x and other species are collected and reported to agencies at Cristal facilities around the globe. Data is also used as part of monthly internal KPIs. Carbon footprint, expressed as CO ₂ equivalents, is calculated including Scope 1 (direct) and Scope 2 (indirect energy-related) and 3 (indirect non energy-related) sources.

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		<p>operate at a target efficiency (85% removal) and ammonia slip (<20ppmv) to limit outlet NOx from these sources to 25 ppm. The SCR efficiency is maintained through controlling the ammonia flow which is typically done automatically.</p> <ul style="list-style-type: none"> • PDH/PP Plant Waste heat boiler stack is point source emission tested and reported annually for NOx, NH3, CO and non-methane hydrocarbons • PDH/PP Plant Waste heat boiler stack is equipped with CEMS for NH3/NOx, CO and THC which are summarized and reported monthly (electronically) • PDH/PP Plant Reactor charge heater is emissions tested and reported annually for NOx, and CO • PDH/PP Plant Reactor charge heater is equipped with CEMs for CO which is summarized and reported monthly • PDH/PP Plant Utility Boiler is emissions tested and reported annually for NOx • HDPE/LDPE Plant RTO annual stack test • HDPE/LDPE Plant RTO is equipped with CEMs for CO summarized and reported monthly • U&O Boiler requires an annual performance test to ensure NOx, CO, SO2, Organic Emissions and PM are within design parameters • U&O Boiler stack is equipped with CEMS for NOx, SO2, CO and Opacity; summarized and reported monthly 	
Measures to reduce atmospheric emissions not related to		<p>Non energy-related emissions included in GHG calculation:</p> <ul style="list-style-type: none"> •Fugitives Emission •Process stationary combustion non- energy •Venting/flaring 	<p>Process (non energy-related) emissions are monitored, and included in monthly KPIs to be targeted for reduction.</p>

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energy consumption			
Data on VOC emissions		<p>VOC emissions measured and reported to agencies include:</p> <ul style="list-style-type: none"> • Ethylene Plant Package boilers (2) are stack tested biannually • Ethylene Plant, HDPE/LDPE Plant, and U&O must conduct LDAR program which includes semi-annual records of fugitive emissions monitoring and maintenance activities maintained on site for a minimum period of three years. (may revert to annual pending consecutive semi-annual results) • Ethylene Plant submitted a 2014/2015 Air emission inventory (next inventory is due in 2019 with PAP (renewal) <p>PDH/PP Plant submitted 2014 Air emission inventory (next inventory is due in 2018 with PAP renewal).</p>	<p>Internal Key Performance Indicators (KPIs) relating to hazardous materials release to air are measured and reported monthly.</p> <p>Many relating to facility operating permits are reported routinely to regulatory agencies.</p>
Measures to reduce environmental impact from transportation of products		<p>TPC participates in Gulf-SQAS industry program to reduce environmental impacts of logistics (transport & warehouses)</p> <p>http://www.gulfsgas.com</p>	<p>Through their Responsible Care program, Cristal partners with logistics companies to improve human and environmental safety during product transportation.</p>
Data on waste generation		<p>TPC KPI on material loss, measured monthly, goes beyond “end of pipe” waste generation and includes:</p> <ul style="list-style-type: none"> • Point Source Process Emissions to Air, • Flare Loss, • Fugitive Emissions, • Material Loss to Water, • Spills & Releases, • Storage Tank & Loading Losses, and • Industrial Waste (Hazardous & Non-Hazardous). <p>Waste summary report (all TPC units) detailing amounts of waste produced, disposed and</p>	<p>Data published in Cristal Sustainability Reports (pg. 11 of 2017 report) includes:</p> <ul style="list-style-type: none"> • Total waste waste (ton per ton of product) hazardous waste generated • hazardous waste recycled • hazardous waste treated • hazardous waste landfilled • non-hazardous waste generated • non-hazardous waste recycled • non-hazardous waste treated • non-hazardous waste landfilled

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		transported must be submitted semiannually.	
Data on % recycled waste		TPC has a program to either recycle or reuse packaging materials.	Data published in Cristal Sustainability Reports (pg. 11 of 2017 report) includes kilo tons: <ul style="list-style-type: none"> • hazardous waste recycled • non-hazardous waste recycled
Data on environmental nuisance sources (dust, noise, odors)		Boundary Noise Monitoring Report (for all TPC units) is submitted annually to the regulatory agency. Must be below Table 7A criteria - 75dBA [L10]	Potential nuisance dust, noise, and odor sources are controlled at all sites as part of environmental management /permit compliance programs.
Measures to ensure product safety		TPC provides Safety Data Sheets (SDSs) for hazardous products, to guide customers and other product receivers in protecting human and environmental health during product use.	Product Stewardship activities are highlighted at http://www.cristal.com/safety-health-and-environment/Pages/product-stewardship.aspx . The Product Risk Assessment and Management Process addresses issues across the product life-cycle.
Measures to ensure responsible customer relations		TPC research and development center (NIPRAS center) has laboratories equipped for physical and analytical testing, rheological and thermal analysis, molecular characterization and microscopy studies. The center supports product and process development and research, technical support and customer training.	Cristal R&D facilities support product development, production and customer issues: they are located in Yanbu, Kingdom of Saudi Arabia; Stallingborough, UK; and Baltimore, Maryland, USA. http://www.cristal.com/about-us/Pages/research-technology.aspx The Baltimore Research Center supports the company's commitment to coatings, plastics, paper and specialty customers. The work accomplished at this site brings value to societies around the world through the research and development of new products and processes for the production of pigments, intermediate chemicals, and catalysts used in the paint, plastics, paper, automotive, chemicals and energy industries. http://www.cristal.com/Corporate%20Fact%20

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			Sheet/Baltimore Research Center_EN.pdf
Customer satisfaction results		<p>TPC obtains customer complaints and feedback related to its products and services from its official Marketers and conducts in-depth investigations and analysis. When necessary customer on-site visits are conducted to further investigate issues and provide the most effective corrective action.</p> <p>TPC also conducts annual customer satisfaction surveys – the rating for 2017 was over 80%.</p>	<p>Cristal uses an email box – regulatory.query@cristal.com for Customers and Suppliers to discuss product stewardship related items.</p>
Supplier environmental screening		<p>The TASNEE supplier management program brochure at https://issuu.com/supplychaindigital/docs/tasnee-brochure-scd-july2017 discusses environmental and social expectations on pages 13 – 17.</p>	<p>EcoVadis routinely verifies that Cristal (The National Titanium Dioxide Company) assesses suppliers regarding environmental practices.</p>
Supplier social screening		<p>The TASNEE supplier management program brochure at https://issuu.com/supplychaindigital/docs/tasnee-brochure-scd-july2017 discusses environmental and social expectations on pages 13 – 17.</p>	<p>EcoVadis routinely verifies that Cristal (The National Titanium Dioxide Company) assesses suppliers regarding social practices. Additionally, measures to control the origin of raw materials are in place. And a formal assessment of supplier progress regarding REACH (product safety) requirements was completed. These have also been verified by EcoVadis.</p>
Measures to promote equal opportunity			<p>The Cristal equal opportunity policy is discussed on page 13 of the Sustainability Report. It is a commitment to recruit, hire, promote, re-assign, compensate and train persons in all job classifications without regard to race, color, religion, sex, age, national origin, disability, sexual orientation or any other legally protected classification. This policy is supported by a group of policies and procedures that</p>

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			includes code of conduct and business ethics and a policy on preventing workplace discrimination, harassment, bullying and violence.
Accident frequency rates, fatalities, H&S indicators	<p>Tasnee KPIs for all facilities measured monthly to address health and safety issues. Robust safety management system modelled after OHSAS 18001. EHSS standards to insure training and implementation of EHSS programs meet a minimum expectation. In 2016 there were no contractor or employee fatalities at any TASNEE site.</p> <p>TASNEE conducted over 3300 occupational health consultations as well as 144 health awareness sessions/campaigns across the manufacturing sites in 2016.</p> <p>TASNEE's incident rate which is calculated for both contractors as well as employees is below industry average.</p>	<p>TPC completed 13 million safe man-hours without a lost workday injury in December 2016 which was reported in local news reports.</p> <p>TPC is developing a new Medical and Occupational Health clinic in the Riyadh area.</p>	<p>Occupational Health & Safety data is published in the Sustainability Report page 14. Data includes Total Recordable Incidence Rate (TRIR). Recordable injuries and illnesses include all work-related deaths, illnesses, and injuries that result in a loss of consciousness, restriction of work or motion, permanent transfer to another job within the company, or that require some type of medical treatment other than first-aid treatment.</p> <p>Process Safety event rate is also reported.</p>
Training hours per employee	<ul style="list-style-type: none"> • TASNEE requires every employee to maintain and individual development plan for their professional career. • TASNEE has a global training center which develops and tracks training for every employee. • Elements of EHSS training are required as a condition of employment. • TASNEE conducts both in person as well as computer based training at their sites for environmental, health, occupational safety, process safety as well as security training. <p>Numerous other training</p>		<p>Training hours per employee is reported in the Sustainability Report page 15. For 2016, the average was 48 hours per employee, an increase of around 13% compared to 2015.</p>

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	<p>programs are in place to support the ISO 9001 and similar quality systems.</p>		
<p>Protection of human rights</p>	<p>TASNEE has a Code of Conduct program to ensure all employees understand and comply with the human rights requirements. This program is reviewed annually.</p> <p>All the TASNEE sites abide by the Federal and regional laws which apply to human rights and equal opportunity. Evidence of this can be found on TASNEE employment applications where the laws are listed and compliance is noted.</p>		<p>The comprehensive Cristal Sustainability Report (http://www.cristal.com/news-room/Documents/Sustainability_Report_Interactive.pdf, page 28) gives an overview of diversity and equal opportunity programs. Anti-corruption and anti-competitive behavior programs are discussed on page 30. Labor/management relations are discussed on page 25.</p>
<p>Share of women in the workforce</p>			<p>Distribution of full-time employees by gender (and also by age) is published in the periodic Sustainability Reports (page 4 of 2017 Report)</p>
<p>Share of women in management positions</p>			<p>Management gender numbers and percentages are reported in the 2017 Sustainability Report on page 4.</p>
<p>Voluntary community initiatives</p>	<p>Tasnee allocates 1% of its profits to support charitable and humanitarian projects in Saudi Arabia.</p> <p>Tasnee provided support to a number of educational, cultural, social and medical programmes.</p> <ul style="list-style-type: none"> - Tasnee provided training for secondary school students on its 3D training programme which teaches them how to design three dimensional models and raise the society awareness on this technology. <p>Furthermore, Tasnee carried out an environmental awareness campaign "Waste Free</p>	<p>TPC had a roadside clean-up day as well as several other activities during 2016. TASNEE supports several non-profit charities to support the people and the communities they work and live in.</p>	<p>All Cristal sites partner with local communities to implement programs, such as ones highlighted at http://www.cristal.com/about-us/Pages/community.aspx, and starting on page 17 of the 2017 Sustainability Report</p>

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	<p>Environment". The campaign was carried out in eight different locations and 850 volunteers participated in it.</p> <p>- Several sites allow the local community to visit, to better understand the process and the safety measures which are in place to protect them.</p>		
Nationalization rate	<p>TASNEE has a Saudization Program for the sites located within the Kingdom. This policy is shared with the authorities as required.</p>	<p>Addressed through TASNEE corporate program.</p>	<p>Sites in KSA are addressed through TASNEE corporate program. Not applicable for facilities in other locations.</p>
Promotion of social and economic development	<p>TASNEE allocates 1% of annual profits towards programs described in the Corporate Social Responsibility Annual Report (http://www.tasnee.com/en/SocialResponsibility/Pages/Reports.aspx) Page 13 (English version) gives an overview of cultural, rehabilitation, social and health programs conducted within the Kingdom of Saudi Arabia (KSA).</p> <p><u>Cultural Programs:</u> These include publishing and distributing of awareness publications, support of inventors, innovation seminars, sponsoring of educational conferences, moral awareness, social interaction, Quran interpretation and scientific contests, support of Islamic call libraries, community awareness, health awareness campaigns, support of development studies, security and environmental education and sports contests.</p>	<p>TPC personnel participate in KSA programs discussed in the "TASNEE Corporate" column at the left.</p>	<p>Cristal personnel located in the KSA participate in the programs discussed in the "TASNEE Corporate" column at the far left.</p> <p>Personnel in other locations have long established programs integrating social, economic and educational programs. For example, the Pariba, Brasil titanium mine</p> <ul style="list-style-type: none"> • uses seedlings from a local community nursery program for reclaiming former mining areas. • runs an environmental education program in collaboration with NGO and community leaders • supports education programs with local public schools encouraging reading to more than 300 children per year, and sponsors professional training for residents • provides economic support to local fishermen • sponsors health and well-being programs with the local Health Council, including a program to raise youth awareness on drug abuse and its dangers.

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	<p><u>Rehabilitation Programs:</u> These include sponsoring entrepreneurship and small projects, training of young girls on cooking, stitching, machine embroidery works, weaving works, beauty shops, sewing, secretary works, computer operation, photography, psychological and occupational rehabilitation of imprisoned women, youth training on home medical care, nursery, rehabilitation of blind persons and persons of special needs and rehabilitation of charity societies.</p> <p><u>Social Programs:</u> These include support of public interest societies, endowments, relief of affected persons, support of productive families, taking care of orphans, sponsoring children with disability, distribution of winter blankets and school bags, support of collective marriages, support of family seminars and family social development programs, sending needy people to perform hajj, provide housing for the needy, support of students who have learning difficulties, water provision programs, release of indebted prisoners and support of excess food keeping programs.</p> <p><u>Health Programs:</u> These include support of disability research efforts, support of health service projects, equipping of fixed and</p>		<p>Other facilities have similar programs depending on the needs of their local communities.</p>

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	mobile clinics intended to combat smoking, diabetes, teeth treatment, support of kidney dialysis operations, gathering of medical equipment and blood donations campaigns support.		