FOREWORD

"Hi, I'm Copper" brings out the expanse of this ubiquitous metal which has defined many milestones of human civilization from time immemorial.

DR. ASHUTOSH SHARMA

Institute Chair Professor
Department of Chemical Engineering
Indian Institute of Technology, Kanpur &
Former Secretary to the Government of India
Department of Science and Technology
(January 2015-August 2021)

Copper has contributed substantially to advancing human civilization over past 10000 years. It has been the predominant metal used in society for so long that an entire era between 3300 BC to 1200 BC is called Bronze age, which is an alloy of copper.

The technologies for copper smelting and extraction have evolved over a long period to meet the stringent global standards of emissions, effluent and solid waste management. In the past few decades, significant advances were made in the area of Flash Smelting, Bath Smelting, Gas Collection & Conversion, Tail Gas scrubbing, effluent treatment and recycling technologies.

Among the various technologies used for copper smelting today, Glencore technology's ISASMELT™ process from Australia is thought to be among the best-in-class technologies to meet the highest efficiency and stringent environmental norms. I have been told that in India, Sterlite Copper has employed this technology for its smelting operations in combination with state-of-the-art Sulphuric acid plant from Chemetics, Canada. As per the Brook Hunt report on benchmarking performance of global copper smelters, Sterlite Copper is one of the top 10 smelters that benchmarked in energy efficiency, copper recovery and effluent treatment, indicating their sensitivity for the society, environment and ecosystem they operate in.

While there are 167 copper smelting plants across the globe, it is interesting to see that some of these plants in developed economies around the world, including Hamburg (Germany), Saganoseki (Japan), Busan (South Korea), Utah (USA), have massive capacities built in the heart of its bustling cities. This has been only possible with the adoption of cutting edge technologies for copper extraction while taking care of environment, society and sustainability.

I believe Copper is one of the key drivers of Industry 4.0 and beyond. An invisible enabler, copper's role in the future of our world will be all pervasive from our homes to outer space explorations.

The grand vision of 'Digital India' can only be shaped well when our society is digitally empowered starting with self-sufficiency in power, mobility, and infrastructure. Copper is an imperative for these and other important sectors. Indeed the future progress would depend on the Copper for clean green energy, EV and many innovations for better life and living.

I congratulate the Team Sterlite Copper for bringing out this book on such a noble metal in an interesting and lucid manner and wish all the stakeholders all the best in continued pushing of the technology envelope for sustainable use of the Copper.

Homer, the legendary Greek author, named me Chalkos. At home in India, they called me Tamiram. The Romans renamed me Aes Cyprium. My current name is an anglicized version of this Latin phrase.

HI, I'M COPPER

100953 Sterlite CoffeeTable Book Inside01 Artwork - size: 12x12 inches - 4|4|22 - sKs

MY JOURNEY

He said: Let there be Copper!

It was around 9000 BC that my tryst with man began. In Egypt. In a river. A stray sparkle from my shiny appearance caught his attention and kindled the curiosity hardwired into his system. And true to the spirit of inquiry and new thinking that has distinguished the human mind through history, it was enough to unfold a series of innovations.

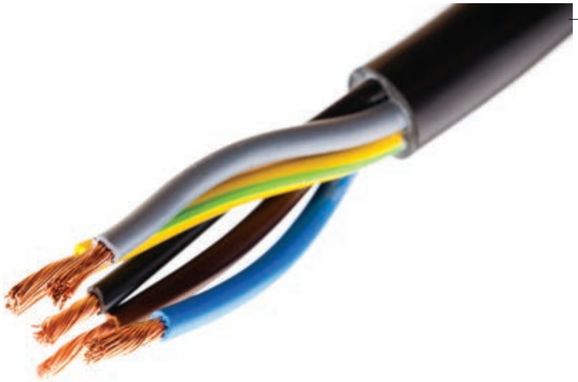
As time passed, man began to understand my properties, my malleability and harnessed my utility to create many milestone applications. The effort remained unabated till the Space Age. From toasting bread to whetting his appetite forexploring the unknown realms of outer space, I soon became an integral part of mankind's evolution.

Today, the world is getting ready for another Copper Age spurred by an unprecedented growth in advanced industrial, energy and consumer applications. Copper known for its high thermal and electrical conductivity and ductility is found in our daily lives which also connects our community, powers jobs, economies, and growth for the entire nation. Copper being the green metal has been considered as a core driver for moving the global economy toward net zero emissions and has been termed as the new oil. Electric cars and spacecrafts will fuel a huge increase in copper consumption. In fact, a single car can have up to six kilometers of copper wiring, according to the International Copper Association.

That's really long, you will agree!

100953 Sterlite CoffeeTable Book Inside01 Artwork - size: 12x12 inches - 4|4|22 - sKs

THE WORLD IS MY STAGE



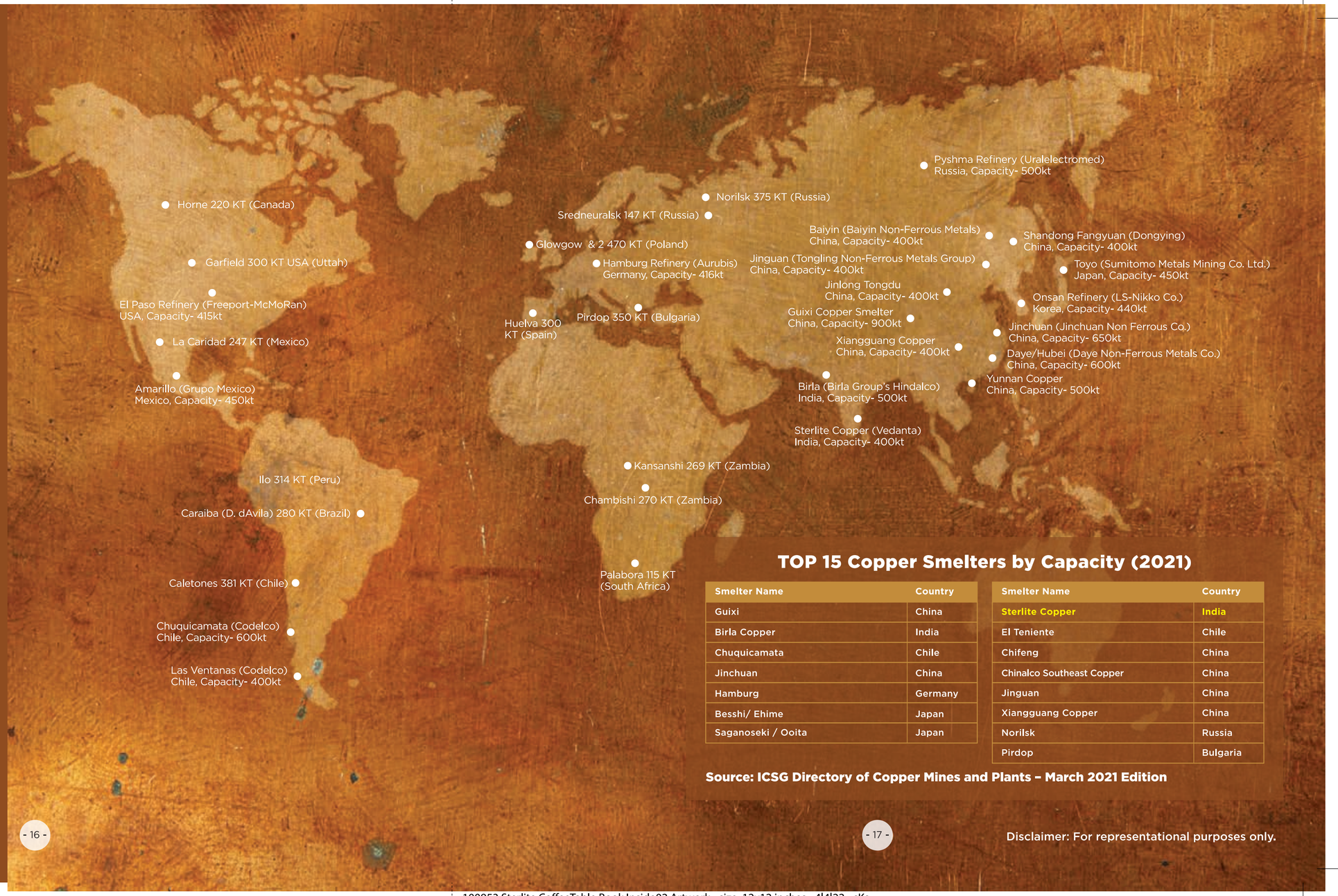
Globalization has made copper more valuable

They say copper usage within a particular economy represents its health and quality of life. Interestingly, developed economies have concentrated more on my antimicrobial benefits and used me in healthcare, food packaging, aquaculture, and air conditioning. In developing economies, inclusive economic growth, affordable housing, industrialization, and infrastructure development are spearheading my usage. In India specifically, the by-products of my smelting process such as Sulphuric and Phosphoric acid are fuelling the growth of agriculture and numerous other industries, including automobiles, consumer durables and electricals. The 21st century however is also likely to be dominated by a milieu in which humans explore the depths of space and extra-terrestrial geographies for signs of life, to colonize and to understand more about the universe. I will be the mainstay of all these endeavours.

100953 Sterlite CoffeeTable Book Inside02 Artwork - size: 12x12 inches - 4|4|22 - sKs

MY SMELTERS ACROSS THE WORLD

Today in developed countries, my plants are situated close to human habitat and functioning for years, providing jobs and development to the surrounding region. There is ample proof that industries and communities can peacefully coexist, provided the right mechanisms are in place. Globally, there are 167 of my smelters, out of which 3 are in India, and amongst them Sterlite is one of the largest of my smelters located at Thoothukudi, Tamil Nadu which manufactured Copper Cathodes and rods, along with associated facility such as a Phosphoric Acid Plant, a major raw material catering to the fertilizer industry.



TOP 15 Copper Smelters by Capacity (2021)

Smelter Name	Country
Guixi	China
Birla Copper	India
Chuquicamata	Chile
Jinchuan	China
Hamburg	Germany
Besshi/ Ehime	Japan
Saganoseki / Ooita	Japan

Smelter Name	Country
Sterlite Copper	India
El Teniente	Chile
Chifeng	China
Chinalco Southeast Copper	China
Jinguan	China
Xiangguang Copper	China
Norilsk	Russia
Pirdop	Bulgaria

Source: ICSG Directory of Copper Mines and Plants – March 2021 Edition

Disclaimer: For representational purposes only.

100953 Sterlite CoffeeTable Book Inside02 Artwork - size: 12x12 inches - 4|4|22 - sKs

STATUE OF LIBERTY, USA

Through one hundred years of biting sea winds, driving rains and beating sun, the copper skin of the Statue of Liberty has not only grown more beautiful but has also remained virtually intact in terms of strength and durability.

100953 Sterlite CoffeeTable Book Inside02 Artwork - size: 12x12 inches - 4|4|22 - sKs

MY STERLITE DIARY

1996 - Thoothukudi. That's where it all began, serving an array of industries, including defence, automobiles, consumer durables, electricals and construction. In FY 2018 Sterlite had the distinction of meeting 36% of my demand nationally and contributed significantly to my global demand.

1996 — 100 KTPA smelter commissiond

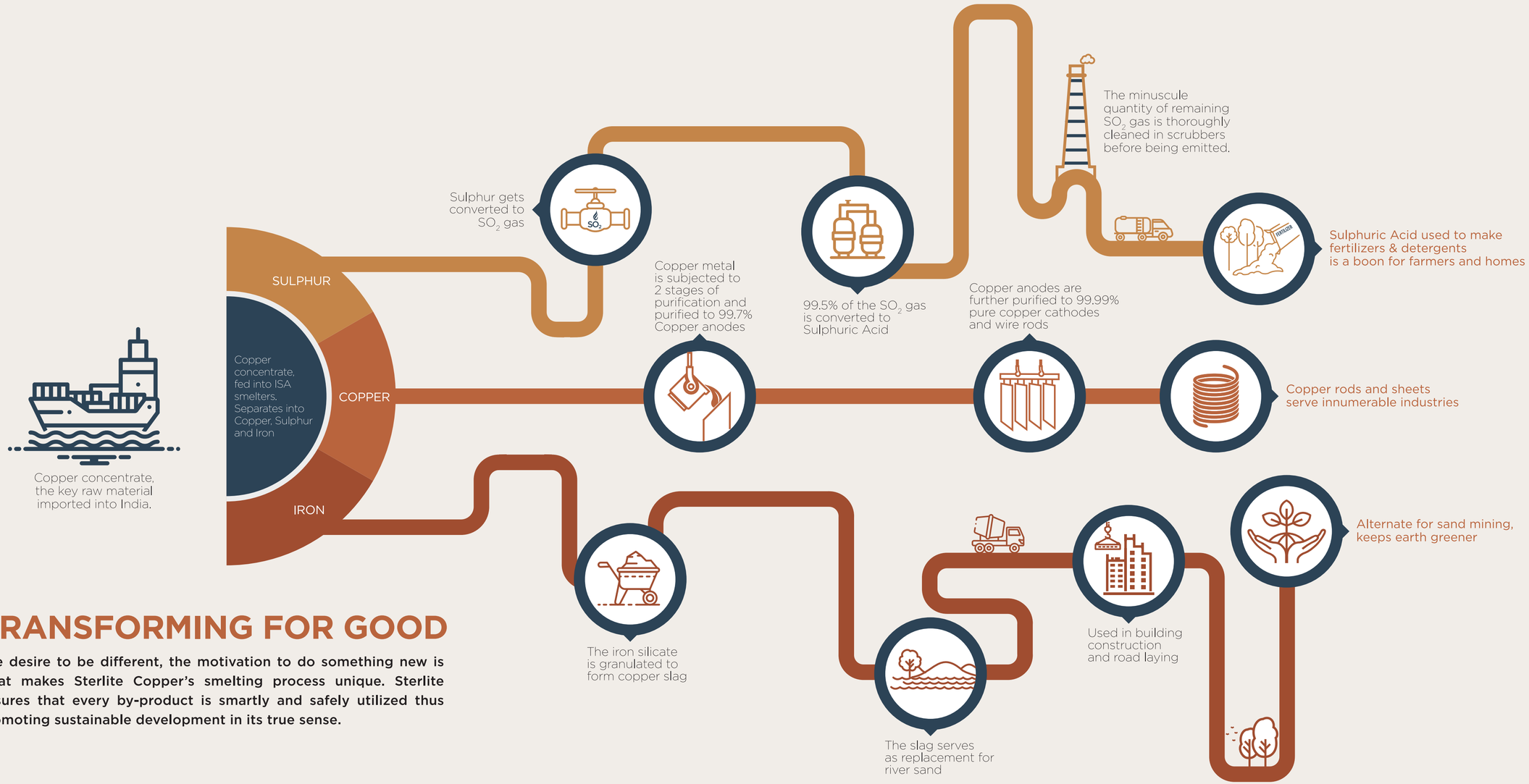
1999 — Phosphoric acid plant with 220 KTPA capacity commissioned

2005 — Production capacity enhanced to 300 kt

2007 — Production capacity enhanced to 400 kt

2013 — 160 MW Thermal Power Plant commissioned (60 MW generated for captive use and surplus supplied to Tamil Nadu state power grid)

100953 Sterlite CoffeeTable Book Inside03 Artwork - size: 12x12 inches - 4|4|22 - sKs



TRANSFORMING FOR GOOD

The desire to be different, the motivation to do something new is what makes Sterlite Copper's smelting process unique. Sterlite ensures that every by-product is smartly and safely utilized thus promoting sustainable development in its true sense.

100953 Sterlite CoffeeTable Book Inside04 Artwork - size: 12x12 inches - 4|4|22 - sKs

All processes at Sterlite conformed to international standards such as the International Finance Corporation's (IFC) Performance Standards that were applied across the entire lifecycle of all operations. My Smelter at Sterlite Tuticorin is based on state of art Glencore ISASMELT Technology, Australia. The ISASMELT furnace is a vertical shaft type furnace completely lined with refractory into which my concentrate is charged for smelting. Slag or ferro sand generated during the process is used for sustainable applications like cement, pavers and bricks manufacturing, roads, ready mix concrete, abrasives and landfill applications.

The 99.7% pure copper anodes casted from the smelter is taken to refinery for further purification through electro refining process. The refinery is based on ISAkidd technology, Australia which converts my anodes into cathodes of 99.995% purity.

100953 Sterlite CoffeeTable Book Inside03 Artwork - size: 12x12 inches - 4|4|22 - sKs

During my smelting process at Sterlite, Tuticorin; Sulphur in the raw material is converted to sulphur dioxide (SO2). These gases are cleaned through scrubbers and Electro-Static Precipitators (ESP) before being processed and converted into Sulphuric Acid. The Double Conversion Double Absorption (DCDA), a best-in-class technology from Chemetics, Canada used in the sulphuric acid plant across all my major smelting operations around the world is being operated successfully at Sterlite.

At Sterlite, the two plants convert Sulphur Dioxide into Sulphuric Acid, a major raw material for chemicals, batteries, fertilizers and detergent manufacturing industries. Each sulphuric acid plant equipped is equipped with Tail Gas Scrubber to ensure SO2 emissions less than 0.5 kg / MT of acid produced against the norm of 1 kg / MT of Sulphuric acid produced. Part of Sulphuric Acid is further used to produce a value-added product called Phosphoric Acid using the technology from Hydro Agri, UK which is a major raw material for fertilizers in India.

MY MILESTONES OF PRIDE AT STERLITE COPPER

A will finds a way...

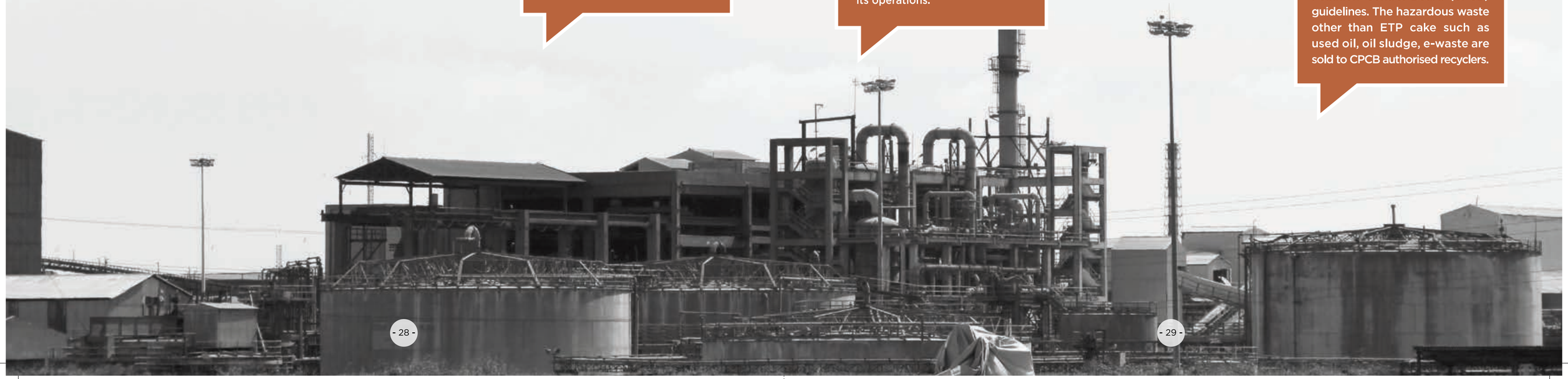
When you decide to excel in what you set out to do, there's no stopping you. Sterlite Copper's operations are benchmarked against global best practices, with certifications in Quality, Environment, Occupational Health & Safety, Energy, Information Security, Lab Accreditation and Asset Optimization. The technologies used are sourced from best-in-class providers across countries such as Australia, USA, Finland, Canada, France and Germany. To my delight, Sterlite has invested over INR 500 crores in environmental safeguards such as Gas Scrubbers, Effluent Treatment Plants and Reverse Osmosis (RO) plants.

Zero Liquid Discharge Unit
Sterlite Copper is the first plant to be equipped with Effluent Treatment Plants (ETP) and Reverse Osmosis Plants (RO) to treat effluents and recycle waste water. Approximately, 60-70% of the water consumption is met through desalinated water and there is no ground water consumption. It has been a Zero Liquid Discharge Unit right from inception which is a unique feature of Sterlite.

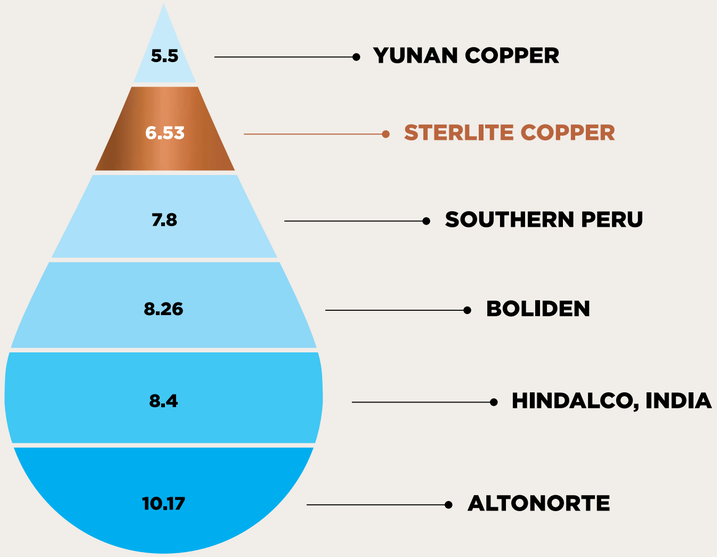
Water Consumption Management
As part of its efforts to minimize water consumption, Sterlite has engaged with a specific business vendor to procure desalinated water, thus reducing any dependence on freshwater sources. Sterlite Copper has also upgraded from water cooled technologies to air -cooled technologies for operations. Further, the company has installed rainwater storage tanks with a capacity of 1 lakh m3, to utilize in its operations.

Value from Waste
With advanced technology, Sterlite yields more value from its by-products to achieve higher waste reduction and also extracts various other trace elements from the waste produced.

Solid Waste to Sustainable applications
High Volume Low Impact wastes like Gypsum, Slag, Fly Ash and Bottom ash (from the power plant) find sustainable use in laying roads, cement production and concrete manufacturing. The hazardous waste generated from the Effluent treatment plant is disposed in the on-site secure landfill facility constructed and operated as per Central Pollution Control Board (CPCB) guidelines. The hazardous waste other than ETP cake such as used oil, oil sludge, e-waste are sold to CPCB authorised recyclers.

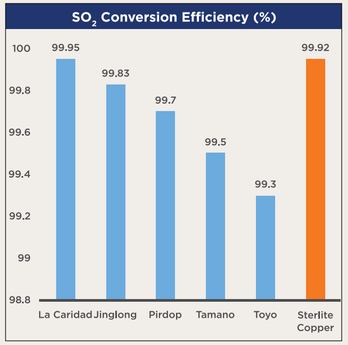


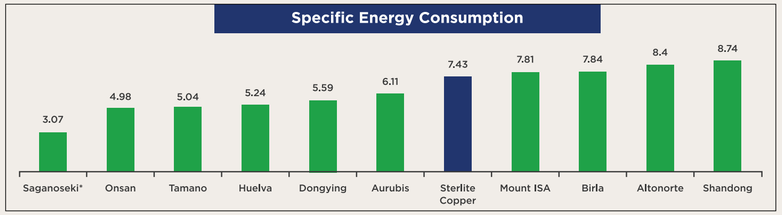
To combat the dual challenges of water scarcity and pollution of aquatic environments by industries, stringent regulations are today driving the adoption of zero liquid discharge technology towards maximizing water usage efficiency.



SPECIFIC WATER CONSUMPTION BENCHMARKING

Source: Brookhunt & SD Reports FY 18 with water consumption as low as 6.53m3/per metric ton of cathode.





Source: Brookhunt & SD Reports FY18

My First Milestones

- Indian Copper Smelter to have achieved lowest emission of 0.5kg/ton of sulphuric acid produced against the norm of 1kg/ton of acid produced.
- Copper Smelter with Waste Heat Recovery Boiler approved under Clean Development Mechanism
- In the country to have established and installed continuous operating (24/7) Tail Gas Scrubbing
- Copper Smelter to have a Zero Liquid Discharge facility since inception
- South Indian company to have secured landfill facility
- Copper Smelter to get approval from Bureau of Indian Standards for utilization of copper slag for sustainable applications

Disclaimer:
Creative representation only.

STATUE OF BUDDHA, BHAGALPUR

7 feet 6 inches high and weighing nearly 1 ton, a Buddha statue was discovered at Sultanganj in Bhagalpur in the ruins of an old Buddhist monastery. The remarkable copper colossus is testimony to the metallurgical skills of the ancient Hindus of the fifth century AD.

100953 Sterlite CoffeeTable Book Inside05 Artwork - size: 12x12 inches - 4|4|22 - sKs

MUTHUCHARAM

EMPOWERING COMMUNITIES. TRANSFORMING LIVES.

Did you know Sterlite Copper partners with all stakeholders who share their vision of an aspirational, empowered society working together for the common good of all. Their keystone development initiative Muthucharam, put together in consultation with community members, is well underway. In the coming years, these projects, including a Smart School and a well-equipped Hospital, will deliver considerable benefit to the people of Thoothukudi. Some of their recent initiatives include:

PASUMAI THOOTHUKUDI

- Aim to plant 1 million trees across Thoothukudi, to make it one of the greenest cities and to bring about a rapid positive environment change. So far 1.16 lakh trees saplings have been planted.
- A total of 16 villages with an area span of approximately 101 hectares have been covered under this initiative.

TAMIRA SURABHI

- Access to clean drinking water is an inalienable right of every human being and under this project clean drinking water is supplied to the people of Thoothukudi.
- A total of more than 2,300 families from 13 villages have benefitted from this project until today.
- 36000 liters of clean drinking water is distributed on alternate days to each family residing in the villages.

100953 Sterlite CoffeeTable Book Inside05 Artwork - size: 12x12 inches - 4|4|22 - sKs

TAMIRA VIDHYALAYA

- Sterlite Copper has also launched a new scholarship initiative, 'Sterlite Education Scheme for Students' and so far, 11,000+ students have benefitted.
- Under this project smart schools were built with the aim to provide quality education for the children in the core vi
- The students have been given scholarships and are encouraged to pursue their education. A total of 4000+ families will benefit through this initiative.

SAKHI - WOMEN RESOURCE CENTRE

- The objective of this initiative is to empower women through entrepreneurship and skill training.
- A total of 5000 women are set to benefit from the initiative through various entrepreneurial development programs like Training sessions on Bag stitching, Mushroom & Bee Cultivation and Sanitary Napkin Production.
- A total of 6000 women are benefitting till date, who are a part of the Self-Help Groups from in and around Thoothukudi.

TAMIRA MUTHUKKAL – YOUTH RESOURCE CENTRE

- Conceptualized and instituted to provide assistance to the youth of Thoothukudi.
- The objective is to equip the youth of Thoothukudi with skills that will guarantee employment by providing the right training focusing on the 5 trades namely sewing machine operator, welding, general electrics, logistics and food processing.
- All the aforementioned trades have been identified as priority areas via the Skill Gap Assessment Report of the National Skill Development Corporation (NSDC).
- Each course involves 300-400 hours of training, aiming to provide training to 600 youths, which is expected to reach 1500 youth.

TAMIRA HOSPITAL

- Aiming at providing state of the art healthcare facilities to the residents of Thoothukudi.
- Amidst the pandemic, Sterlite Copper extended its support to the people of nearby villages, by distributing medical grade oxygen, ration kits, masks, sanitizers thereby covering 12,000 families etc.
- Under the healthcare initiative free health consultation and medicines were provided to the residents of 21 core villages.

100953 Sterlite CoffeeTable Book Inside05 Artwork - size: 12x12 inches - 4|4|22 - sKs

THERE IS NO PLANET B

That's a truth one must live with. Development of an individual and maintaining a sustainable environment is a collective responsibility. While the development is focused on the individual's growth, it should also promote sustainability. Let's now have a look at Sterlite Copper's benchmarking initiatives towards keeping the environment safe. This section might seem a little too technical, but hang in there, it's worth the read to understand everything the company does to ensure a safe environment for its partner community!

DEDICATED GAS CLEANING PLANT (GCP)

The primary off gases from the smelter and converter operations are collected and sent to the Gas Cleaning Plant. The fine dust containing metals in the gas stream is scrubbed off in the Gas Cleaning Plant through an intensive Gas Liquid Contact process. Thus producing clean gases. The cleaned gas further passes through multistage wet Electrostatic Precipitators to get a crystal-clear Sulphur dioxide gas. The effluent generated in this process is sent to state-of-the-art Effluent Treatment Plant of Hindustan Door Oliver and Chemetics Technology, ensuring Zero Liquid Discharge.

Cost of project: INR 1100 Lacs

Benefits: Helps eliminate particulates from the sulphur dioxide gas to produce better quality, crystal clear sulphuric acid.

SECONDARY GASES SCRUBBING SYSTEM

The relatively low concentration of secondary sulphur dioxide gases from the smelter and convertor furnace operations are collected through duct arrangement. The collected off-gases are scrubbed off with lime to bring down the concentration before venting through stacks, thus meeting the emission norms set by the Ministry of Environment & Forests.

Cost of project: INR 360 Lacs

Benefits: Significantly reduced stack emissions.

SCRUBBERS AT ACID PLANTS

Phosphoric Acid Plant – A five-stage scrubbing system replaced the three-stage scrubbing system to control fluorine emission thereby enhancing control of emissions. Due to multiple stages of scrubbing, Hydro Fluoride emissions are converted into hydrofluorosilicic acid ensuring enhanced resource recovery and reduced emissions.

Cost of project: INR 200 Lacs

Benefits: Fluorine emissions reduced to below statutory levels, Enhanced resource conservation.

SULPHURIC ACID PLANT – TAIL GAS SCRUBBER

Sterlite is the only plant in the country to have established and run a Tail Gas Scrubber consistently to bring down the sulphur dioxide emissions from the sulphuric acid plant to significantly lower levels. An Alkali Tail Gas Scrubber has been installed at both the Sulphuric acid plants. Caustic lye is used as a medium for scrubbing the gases in place of the conventional lime scrubbing. The sulphuric acid plant is adopted from Kvaerner Chemetics, Canada, and the technology is installed and operated successfully across all major Lead, Copper Smelting and Converting operations around the world.

Cost of project: INR 800 Lacs.

Benefits: Achieved emission level of less than 0.5 kg/ Ton of acid produced against the norm of 1kg / Ton of Sulphuric acid produced.

100953 Sterlite CoffeeTable Book Inside06 Artwork - size: 12x12 inches - 4|4|22 - sKs

At my plants worldwide, the sustainable use of industrial waste is the new mantra as industries increasingly seek to protect the natural environment, while simultaneously driving innovation and not compromising on the quality of life. Copper slag, for instance, is productively used by many industries.

At Sterlite Copper, 100% of the slag generated from operations is used for various beneficial applications like construction, road laying, landfill application, sandblasting and in the cement industry, as approved by Bureau of Indian Standards (BIS). Copper Slag or Ferro sand has been termed by Central Pollution Control Board as non-toxic, non-hazardous and non-leachable in nature. This sustainable use of industrial waste protects the environment by minimizing the usage of natural resources such as river sand.

100953 Sterlite CoffeeTable Book Inside06 Artwork - size: 12x12 inches - 4|4|22 - sKs

FLUE GAS DESULPHURISATION SYSTEM (FDGS) SCRUBBER WITH BAG FILTER IN PRIMARY SMELTER

FGDS comprises a bag filter with dry lime injection system for dust removal followed by two stage scrubber for sulphur dioxide removal followed by a caustic lye polishing system. The scrubbed gases are vented through the existing stack arrangement. As the dust in the gases is removed before entering the scrubber, the output generated from the scrubbers is relatively free from metals, thus enabling the Effluent Treatment Plant (ETP) to produce better quality gypsum.

Cost of project: INR 4500 Lacs

Benefits: Enhanced scrubbing system and production of clean gypsum.

CONVERTER BAGHOUSE IN SECONDARY SMELTER

The secondary gases collected from the convertor furnace operations is passed through the modules of the baghouse to filter dust from the gas stream. The clear gas is sent to scrubbers for necessary lime scrubbing. All operational stacks are provided with interlocking arrangements and with online analyzers connected to Care Air Centre, TNPCB & CPCB.

Cost of project: INR 3500 Lacs

Benefits: Helps produce clean gypsum.

SULPHURIC ACID PLANT CONVERTER MODIFICATION FOR BETTER EFFICIENCY

A converter bed and a heat exchanger are installed in the already existing Sulphuric Acid Plant – 1. This has further helped in improving the conversion process efficiency from 99.6% to 99.99% of Sulphuric Acid Plant at par with global smelter.

Cost of project: INR 1665 Lacs

Benefits: SO2 Emission rates reduced to less than 1Kg/Ton of acid produced and improved conversion rates of SO2 to SO3, which is at par with global emissions.

100953 Sterlite CoffeeTable Book Inside06 Artwork - size: 12x12 inches - 4|4|22 - sKs

EFFICIENT WATER MANAGEMENT SYSTEMS

The Effluent Treatment Plant is upgraded to handle the effluents using Sodium Sulphide Process in order to reduce hazardous waste generation. This would also help segregate clean gypsum for sale, helping create value from waste. The company has also installed a Reverse Osmosis plant for tertiary treatment of effluents. The treated water thus generated is reused in the operations.

Cost of Project: ETP upgrade: INR 91 Lacs
RO Plant: INR 7500 Lacs

Benefits: Improved Automation for efficient ETP process and optimization / reduction of hazardous waste, reduced intake of raw water and efficient reuse of water.

GYPSUM PIPE CONVEYOR

Gypsum, a by-product from the phosphoric acid manufacturing operations is laden with 20-22% moisture at the time of production. The gypsum generated is transported in the tube conveyor from the point of generation to the intermediate storage in gypsum pond. This closed tube conveyor operations have significantly eliminated dust emissions arising from spillage of gypsum. It has also eliminated the need to transport gypsum via trucks thereby greatly reducing traffic inside the plant.

Cost of project: INR 250 Lacs

Benefits: Significantly reduced dust emission, zero resource loss, zero spillage, enhanced safety.

CONVERSION FROM WATER COOLED SYSTEM TO AIR COOLED SYSTEM FOR ACID COOLING IN SULPHURIC ACID PLANT (SAP)

The conventional water-cooling system for reducing the temperature of the Sulphuric Acid has been replaced with air cooled condensers. This technology was embedded as a part of the design control measure for enhancing the conservation and reuse of water. In this process, large diameter fans are used to pull the atmospheric air to cool the hot water circulated in the tubes. Air cooled condensers is a closed loop operation that eliminates the evaporation of water.

Cost of project: INR 434 Lacs

Benefits: Reduced consumption of raw water by 60%.

WASTE HEAT RECOVERY BOILER IN THE ISA SMELTER

Sterlite Copper is the first copper smelter globally to have installed waste heat recovery boiler, for the utilization of waste heat from off gases generated during the pyrometallurgical process of copper. The 5 MW electricity generation project from the Waste Heat Recovery Boiler in Sterlite Copper's ISA Smelter has been identified as a Clean Development Mechanism (CDM) project under the Kyoto Protocol. (The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and commits state parties to reduce greenhouse gas emissions.) The gases coming from the smelter are laden with heat. The heat generated from these gases is utilized to produce the steam. This steam is then used in running the turbine and generator. The estimated annual carbon credit generated from this project is about 27000 tonnes. The project was certified by UNFCCC under Clean Development Mechanism and has the potential to offset 1 lakh ton of carbon dioxide.

Cost of project: INR 3500 Lacs

Benefits: Generates 5 MW electricity from Waste Heat Recovery Boiler in the ISA Smelter.

Copper is the third most used metal in industrial and civil applications, and its demand increases the need for its production, consequently generating job growth and providing significant contributions to local economies and the nation overall.

Sterlite created direct employment to 4000 people and impacted more than 20,000 people engaged in various supplier and customer units.

100953 Sterlite CoffeeTable Book Inside06 Artwork - size: 12x12 inches - 4|4|22 - sKs

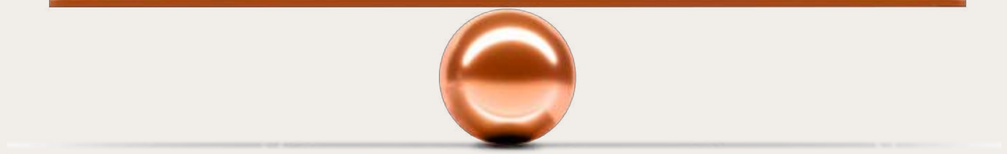
LET’S DISCOVER THE SHINE BENEATH.

Every copper plant opened around the world, has also opened an entire world of possibilities for mankind.

What began as a romance with ornaments, developed into a lifelong association over the centuries. Early copper artifacts, first decorative, then utilitarian, were hammered out from native copper. Today copper plants around the world support a host of critical industries improving the quality of human life. Let’s take a look at the positive impact that a copper plant has on its partner communities.

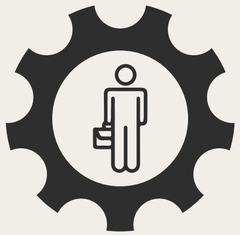
100953 Sterlite CoffeeTable Book Inside07 Artwork - size: 12x12 inches - 4|4|22 - sKs

THE IMPORTANCE OF STERLITE COPPER



Economic Significance

Copper enables India in being Atmanirbhar and plays an important role in meeting the demands of the nation especially in the renewable energy and electric vehicle sector. Since its inception, Sterlite Copper has steadily grown to become one of India's leading copper producers and is serving India's demand for refined copper by catering to more than 500 downstream industries. Their plan was to increase the copper production in India by another 4 LTPA to produce 8 LTPA of metal in the country and make it 'Atmanirbhar' for the next ten years.



Employment Generation

The Thoothukudi Plant has acted as a pillar of support by becoming the source of livelihood for thousands of local people of Thoothukudi. The plant directly engaged about 1000 trucks/ tankers on daily basis with consistent load, thereby providing livelihood to around 9,000 truck drivers and cleaners per month. It had over 650 supply and service partners and helped them generate a business of close to $134 million every year.

Revenue at Thoothukudi Port and FDI Generation

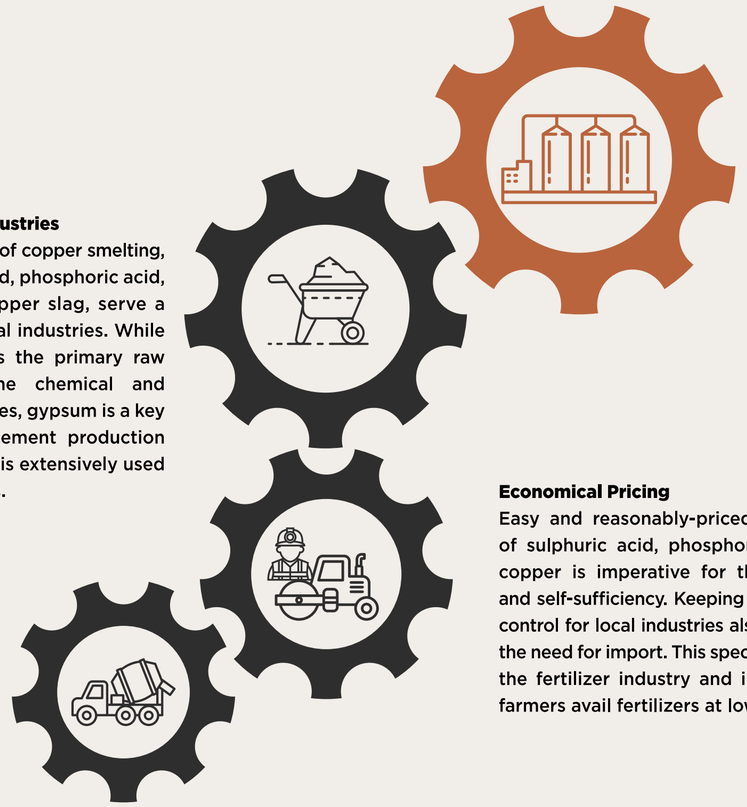
Sterlite Copper has been an important source of revenue and FDI inflows for the state of Tamil Nadu. In 2017-18, the operating income at the Thoothukudi Port was 15.44% more as compared to 2018-19. The FDI inflow into Tamil Nadu was 31.6% more in 2017-18 levels as compared to the US $ 2.38 billion in 2020-21.

Sterlite Copper served a total of 381 domestic companies by supplying them raw material and contributed approximately $295 million to the exchequer.

100953 Sterlite CoffeeTable Book Inside07 Artwork - size: 12x12 inches - 4|4|22 - sKs

Downstream Industries

The by-products of copper smelting, like sulphuric acid, phosphoric acid, gypsum and copper slag, serve a number of critical industries. While sulphuric acid is the primary raw material for the chemical and fertilizer industries, gypsum is a key ingredient for cement production and copper slag is extensively used in building roads.

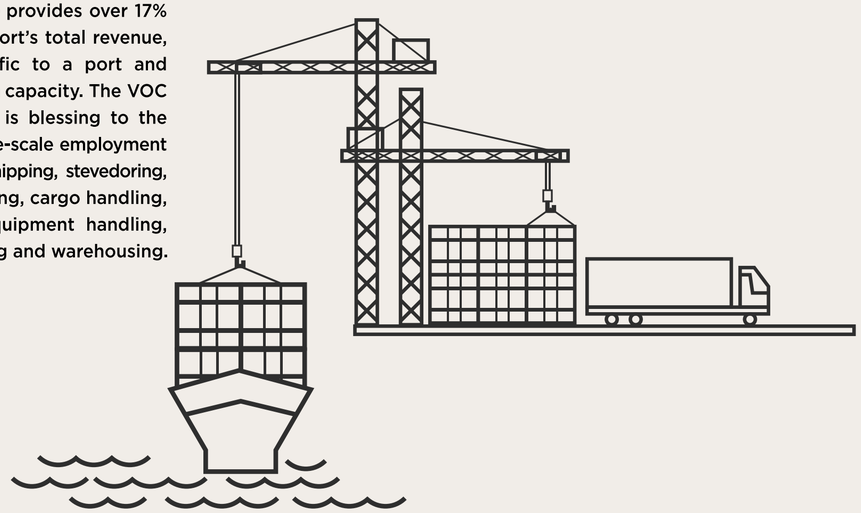


Economical Pricing

Easy and reasonably-priced availability of sulphuric acid, phosphoric acid and copper is imperative for the economy and self-sufficiency. Keeping prices under control for local industries also eradicates the need for import. This specially benefits the fertilizer industry and in turn helps farmers avail fertilizers at lower costs.

Ports and Transportation

Sterlite Copper alone provides over 17% of the Thoothukudi port's total revenue, providing cargo traffic to a port and utilization of its berth capacity. The VOC port of Thoothukudi is blessing to the region, providing large-scale employment covering chartering, shipping, stevedoring, clearing and forwarding, cargo handling, packaging, heavy equipment handling, freight and forwarding and warehousing.



Employment Advantage

Running a large scale copper plant impacts the economy directly by providing much-needed employment to the people of the district and beyond. Be it direct or indirect employment, the scope for providing livelihood to people in and around a plant is always enormous, through an entire network of jobs that get created through the setting up of ancillary and downstream industries.

Advantage to Thoothukudi People

Business has a responsibility beyond its basic responsibility to shareholders; a responsibility to a broader constituency that includes the people of the communities in which it operates. This means providing facilities like education, better healthcare and drinking water. In short, a responsibility to provide better life to people, especially those marginalized in society. We at Sterlite Copper have, and always will, take this responsibility as a duty to serve our community, and our country.

100953 Sterlite CoffeeTable Book Inside07 Artwork - size: 12x12 inches - 4|4|22 - sKs

Responsible entities function with an inherent mandate to operate in an environment friendly manner. Having the right environmental regulation on air and water quality, materials handling and disposal practices in place can successfully mitigate the impact and maintain a healthy balance.

While Sterlite Copper complies with the global environmental regulations, it also follows the best-in-class people practices. It has a fully - equipped Occupational Health Centre for pre-employment/ periodical/ pre-placement/ exit medical examination for all its employees and a mobile healthcare van that provides primary health services to all the villages located near the plant.

100953 Sterlite CoffeeTable Book Inside07 Artwork - size: 12x12 inches - 4|4|22 - sKs

STERLITE TRUTH

Sterlite Copper adopts the world's best available and recent technology for production of copper and for the improvement of environmental and safety performance.

Here are a few important facts about Sterlite Copper and its Operations:

They are mindful of the health of their people

The International Agency for Research on Cancer (IARC) has classified Sulphur Dioxide as a non-carcinogen. The prevalence of cancer in Thoothukudi is below the state average, acting as a strong testament to our responsible functioning.

As per the Crude Incidence Rate (CIR) on cancer published by the Department of Health, Government of Tamil Nadu in the year 2016, Thoothukudi ranks 13 among males and ranks 24 among female out of the 32 districts in Tamil Nadu.

They function in an environmentally responsible manner

Annual average rainfall after the commencement of Sterlite operations was 749mm (1997 – 2015) which shows an increase in rainfall by 32%. The data National Meteorological Department, Chennai does not demonstrate any connection between Sterlite Copper's operations and the rainfall pattern in Thoothukudi. In addition, Thoothukudi' s geographical location lies in a rain-shadow region within Tamil Nadu, and hence, it witnesses comparably lesser rainfall when compared to other regions.

Zero Liquid Discharge

Sterlite Copper has been a Zero Liquid Discharge plant since the inception in 1995. Sterlite never has let its effluents enter the ocean since inception and hence does not impact marine life.

They deploy the best-in-class technologies to treat emissions

Sterlite Copper plant captures sulphur dioxide and converts it into sulphuric acid through Double Conversion Double Absorption (DCDA) Technology, which is world renowned. The sulphur dioxide emissions are within the prescribed norms, constituting to only 1% of the total industry-based emissions in Thoothukudi.

OXYGEN TO NATION

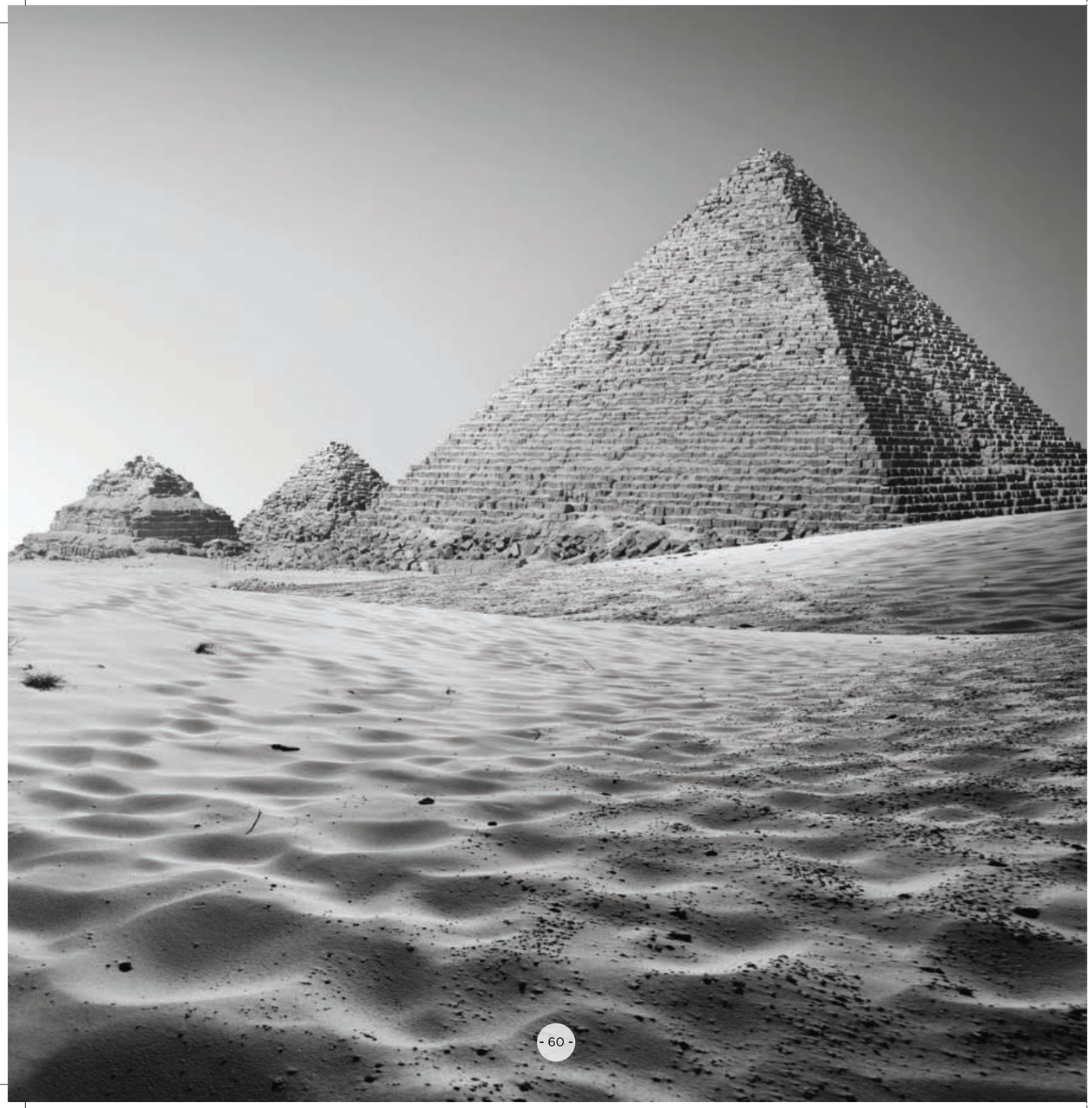
Covid-19 came with unprecedented challenges for the entire nation. Through these tough times, Sterlite Copper and the people of Tamil Nadu strived to overcome this adversity together and emerged victorious.

Sterlite Copper supplied medical grade oxygen to multiple health centers across 32 districts in Tamil Nadu. We reactivated 1000MT oxygen plant on war footing and produced a total of 2000+ tonnes of oxygen. The purity of oxygen improved from 96% to 99% to ensure total hygiene. A total of 142 oxygen beds were provided to the Thoothukudi, Kayalpatinam and Thiruchendur Government Hospitals.

COVID-19 SUPPORT

As a part of its COVID-19 Support Program, Sterlite Copper and its employees intensified efforts to support the people of Thoothukudi. They donated INR 5 crores to Tamil Nadu's CM's Public Relief Fund. All the essentials like critical care beds, intensive care equipment and patient monitoring systems were provided to the Government Hospitals. Essential supplies were provided to 12,000 families in Thoothukudi. Along with sanitizers and masks a total of 13,000 soap bars, 1,300 liters liquid hand wash and 1,000 bottles of hand-sanitizers were also distributed across 18 villages in Thoothukudi.

100953 Sterlite CoffeeTable Book Inside05 Artwork - size: 12x12 inches - 4|4|22 - sKs



PYRAMIDS AT ABUSIR, NORTHERN EGYPT

In 1994, archeologists excavating the remains of a 4,500-year-old Egyptian pyramid complex unearthed a sophisticated copper drainage system, completely intact. Experts speculate that the copper pipes were used to drain well water that was carried into the temple to bathe the king's statues.

100953 Sterlite CoffeeTable Book Inside07 Artwork - size: 12x12 inches - 4|4|22 - sKs

INDUSTRY ACHIEVER OR NATIONAL CONTRIBUTOR

by the Customs Department

by the Customs Department

Sterlite Copper in the CCI Best Export & Port user Award

Awarded for contributions to Exchequer

SUSTAINABILITY & CSR

Silver Trophy, by ASSOCHAM and Ministry of Skill Development & Entrepreneurship (Project Tamira Muthukkal)

by British Safety Council

by CII-EHS

in the CII Southern Region Environment, Health & Safety (EHS)

ENERGY AND WATER CONSERVATION

Industrial Water Use Efficiency at National Competition for Excellence in Water Management by FICCI

in the 17th national Energy Management Award 2016 by CII GBC

CII Noteworthy Water Efficient Unit Award 2016, 2017

CII Excellent Energy Efficient Unit Award 2014 – 2017 (4 times)

HUMAN RESOURCES & EMPLOYEES

Awarded for excellence in HR practices

in the HR club 7th National Conference & Game Changer Awards held by The HR Club.

Best retention strategy & innovation in recruitment strategy

CII – Strong Commitment to HR Excellence Award

INNOVATION, QUALITY & TECHNOLOGY

in QCFI (Quality Circle Forum of India) CCQC (Chapter Convention for Quality Circles) 2017

Business Excellence Team

in National Convention for Quality Circle - NCQC Mysuru

Recognition for Quality

OPERATIONAL EXCELLENCE

Awarded for excellence in operational processes

Frost & Sullivan 14th Edition of India Manufacturing Excellence Award (IMEA)

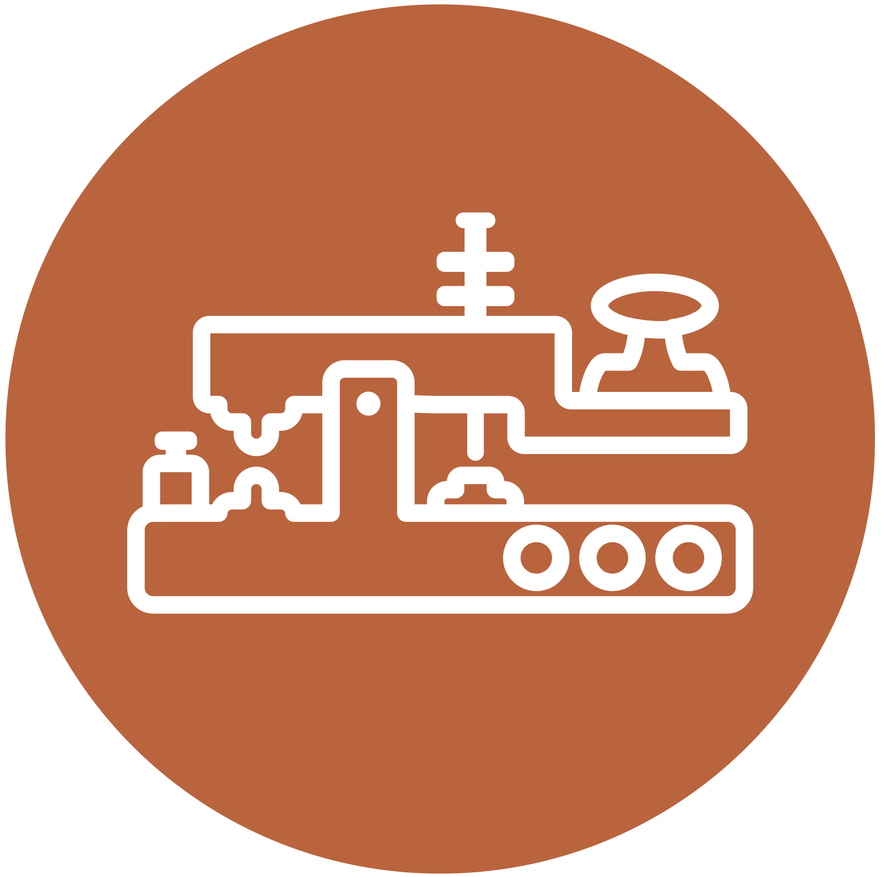
in INSAAN Award 2015

Heavy Engineering' Award by Future Supply Chain
10th Express, Logistics & Supply Chain Leadership Award 2016 by Future Supply Chain.

CREATING CLEAN GREEN THOOTHUKUDI

In its efforts towards working for the environment, Sterlite has developed 43 hectares to develop a greenbelt in and around the plant. This mitigates also dust and noise levels. Furthermore, Pasumai Thoothukudi, a flagship initiative has also been launched and is in progress to plant 10 lakh trees with the aim to make Thoothukudi a green city.

100953 Sterlite CoffeeTable Book Inside08 Artwork - size: 12x12 inches - 4|4|22 - sKs



In 1822 Oersted, a Danish physicist, held in his hands a piece of copper wire, joined to two poles of a Volta pile. And he suddenly saw the magnetized needle on his table move...a wire carrying an electric current deviates a magnetized needle from its position. That was the birth of telegraph and modern communication.

100953 Sterlite CoffeeTable Book Inside08 Artwork - size: 12x12 inches - 4|4|22 - sKs

COPPER, THE FUTURE

Since 9000 BC, there have been numerous instances in my journey with man where I have served his requirements. From being crafted into tools, weapons and ornaments, to travelling with him to the moon, I have faithfully enabled the advancement of human civilization for several millennia. Today man relies on me for power, lighting, heating, communications, water supply and transport. I have helped make homes, hospitals, schools and offices comfortable and efficient, generated clean and renewable energy, and transmitted energy with high efficiency and minimum environmental impact.

At Sterlite too, the journey has been quite momentous. In serving the defence, automobiles, consumer durables, electrical and construction industries, I have been a vital element of India's economic landscape.

It has often been said that, a country's advancement is measured by the per capita consumption of copper. And it is true the world over including Asian countries like China and India. For India in particular, to become a superpower, copper has to be manufactured in-house. And in this mission, copper manufacturing industries have a meaningful role to play.

Throughout the ages, man has relied on copper for development. Copper has been a part of the march of history and continues to hold its importance in our lives today. As technology advances, the demand for copper will only continue to rise. Indeed, the epithet 'red gold' that copper earned in ancient times is just as relevant even today, as copper is now rightly referred to as the metal of the future.

100953 Sterlite CoffeeTable Book Inside08 Artwork - size: 12x12 inches - 4|4|22 - sKs

THANK YOU

for being part of my journey.