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PROJECTS

MIRROR



CONSTRUCTION SECTOR: SHAPING FUTURE

INTERVIEW



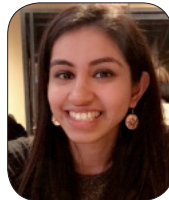
Mr. Manoj Rastogi , CEO
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Mr. Raman Bhatia, Founder
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PRODUCT NEWS



Tata Motors Construk "Carry More!
Earn More!!"

ARTICLE



BKT to unveil world-class,
cutting-edge masterpieces for the
mining sector at the upcoming
11th edition of EXCON

Emission in Steel, Cement and Mining Industry and the first ever Solution



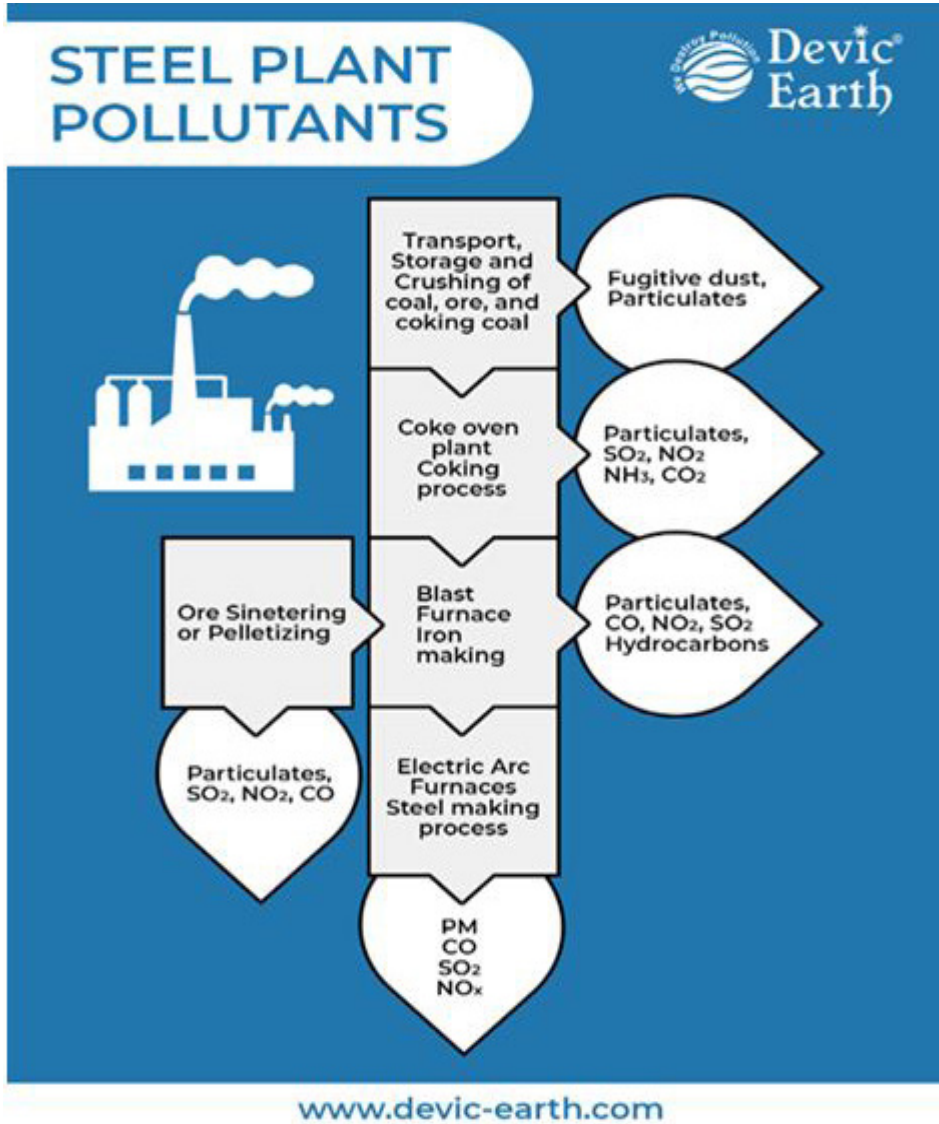
Ms. Radhica Kanninganti,
Head Of Engineering -
Devic Earth

Industrial emissions from sectors like steel, cement & mineral based industries release primary and secondary pollutants from its processes. Several manufacturing activities lead to the toxic disposal of these aerosols creating a natural imbalance and irrevocable social-economic losses including deaths and a severe hit in the global GDP. The long-term impact is significant.

This article attempts to elucidate the process of emission from these 3 sectors and give way for a solution to the recurring damage.

Steel Industry:

The Steel Industry is one of the biggest industries worldwide. India stands second among the largest producers of Steel in the world. Steel is primarily derived from iron ore, and 98% of mined iron ore is utilized in manufacturing steel according to the Mineral Information Institute. It facilitates many industries including construction, automobile, machinery, electrical equipment, and a variety of products ranging from cookware to furniture. It is evaluated that by 2050, steel demand will grow by five times according to the International Energy



Agency. Steel manufacturing is energy-intensive and emits several pollutants including CO2 and particulate matter (PM).

Steel Production and Emission of Harmful components in the process:

- Coke Oven:** Coke Ovens emit a toxic mixture of coal tar, VOCs, arsenic, chromium, and other hazardous air pollutants..
- Blast Furnace:** The use of the Basic Oxygen Method, which involves feeding the furnace with a mixture of metallic ore, coke, and fluxing agents such as limestone to melt iron ore into liquid form also called 'Crude Iron' to move ahead with the further process of Steelmaking. This stage produces pollutants such as hydrocarbons, carbon monoxide, PM, NO2, and SO2.
- Steel Making Process:** This stage involves Primary Steel Forming, in which hot rollers are used to make the steel bend into the desired shape. It involves shaping, drilling, welding, coating with zinc, tempering with heat and surface treatment, etc. This stage releases PM and oxides of carbon, nitrogen, and sulfur.

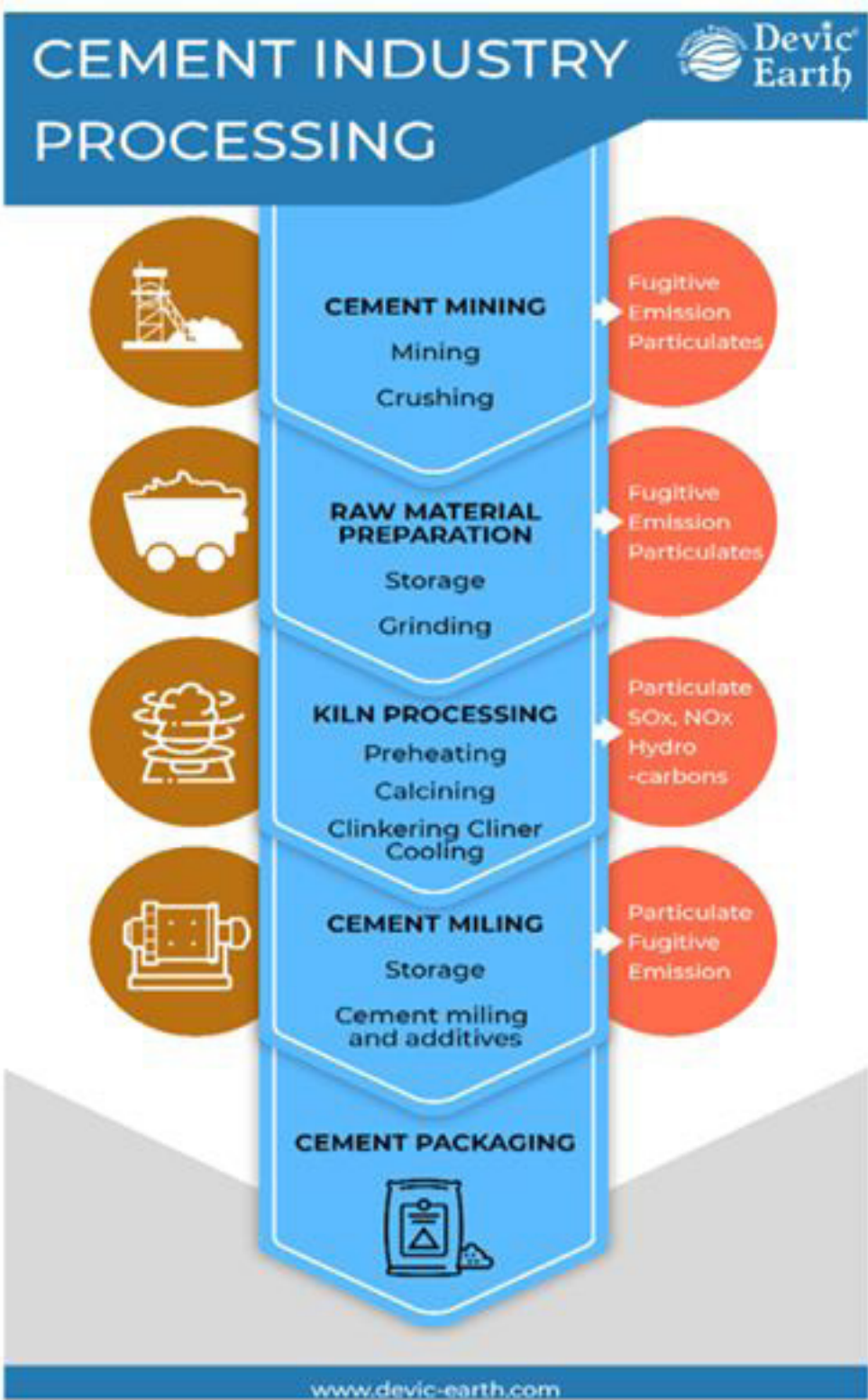
Health impact from emissions from the steel industry could range from respiratory illnesses to permanent damage to the lungs.

Cement Industry:

India's cement industry is the second-largest producer of cement globally. In the financial year 2020, the Indian cement industry had a turnover of Rs 64,000 crore. Dominated by around 30 prominent players, the Indian cement industry comprises around 210 large cement producing plants and 365 small ones. The Cement industry continues to enjoy a robust market demand even through the pandemic as India continues to be the second-

largest global consumer of cement.

On the other hand, the cement industry is one of the most significant contributors to air pollution. The emission of Particulate matter (PM) from cement plants is very high, and cement is understood to be the most polluting industry in the world. As per the European cement association, cement



produces more emissions than all the trucks in the world combined.

Cement Manufacturing Process:

Amongst the 5 stages of Cement Production, it is evident that Particulate Matter of PM 2.5 and PM10 is a significant contributor to air pollution. More importantly, the majority of the emissions from cement industries are fugitive emissions, leading to health hazards not just for workers within the factories, but also for communities living around them.

Socio – Economic Loss:

The pollutants commonly emitted by cement industries are dust or suspended particulate matter (PM), NOx, SOx, carbon oxides, and methane, among others. Cement being the major contributor to air pollution, an approximate number of 4,90,000 global annual deaths may be attributed to emissions from the cement industry. Further, emissions from cement factories also pose a threat to the life of surrounding flora and fauna. Respiratory issues, lung cancers, irregular heartbeat, cough, asthma, wheezing, eye irritation, high BP, etc are some of the common problems residents around cement plants face. Silica dust from cement industries also causes Silicosis.

In an interesting study conducted in the US, the economic benefits of reduced PM emissions from the American cement industry were estimated to range **between 0.76 and 3.97 million USD** annually. The implication of such findings in India, that produces thrice the amount of cement produced

by the USA, is evident.

Mining Industry:

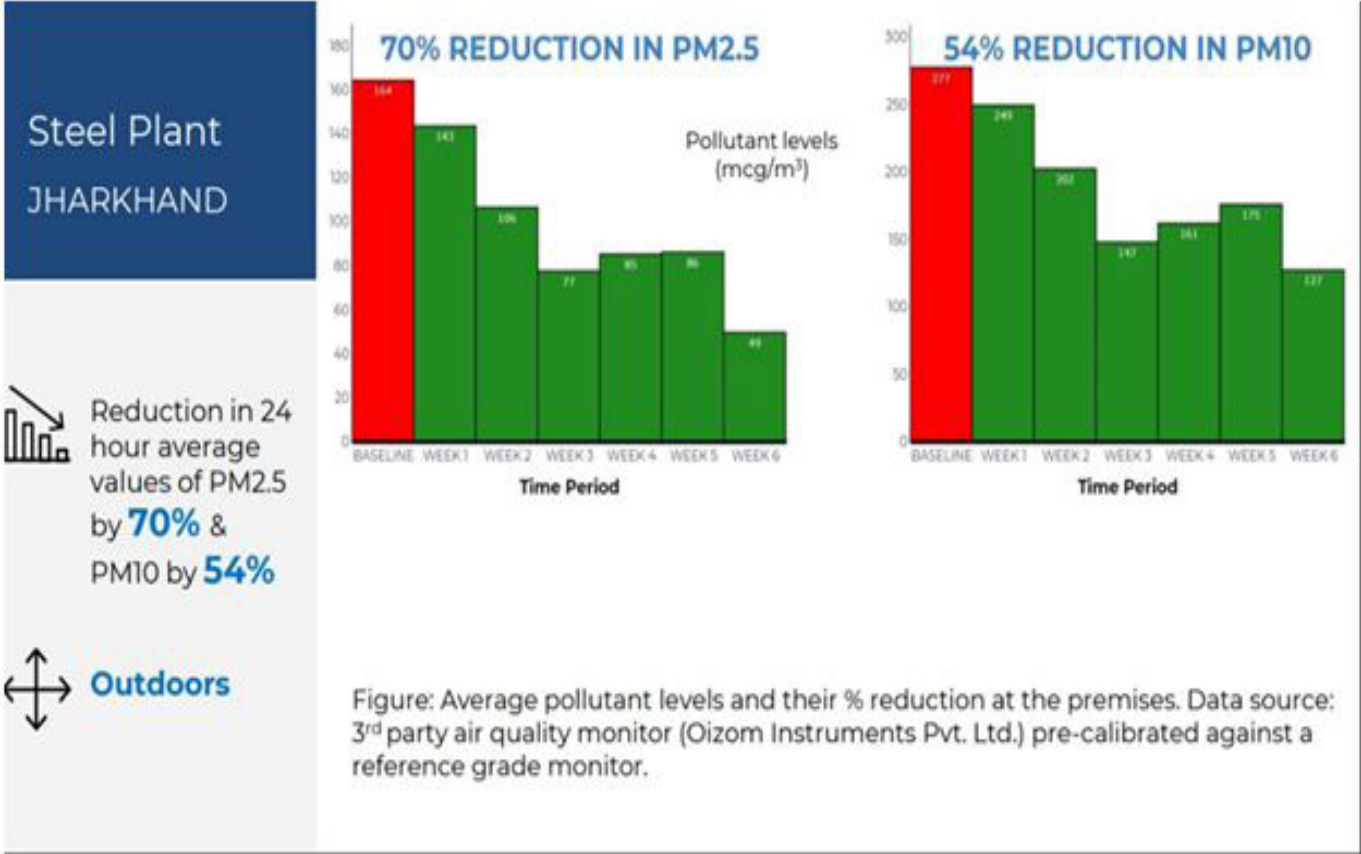
Manufacturing processes of mineral based industries primarily cause huge particulate and chemical fumes that require a variety of controls. Primarily, the core sources of pollution in the industry can be categorized in a 5 step approach from mining and site treatment to the combustion process.

Processes involved in Mining Industry:

- **Excavation**- The mineral rock is blasted at the site to get ore from land
- **Pre-processing at mines**- The ore is crushed in a smaller size at the site for easy transportation
- **Transportation**- The ore is transported for further processing at on-site or off-site plants.
- **Main processing**- This involves a separation process using screening, flotation, grinding, and crushing operation.
- **Refining** – This operation involves more advanced processes like hydrometallurgy, electrometallurgy for highly pure ore.

Each of these processes emits particulate matter (PM1, PM2.5, and PM10) along with the different gasses.

Respiratory Complications from Mining include Black Lungs (repeated inhalation of mineral dust), Asbestosis,



Silicosis, Pneumoconiosis (During blasting and drilling), Lung cancer, Chronic Obstructive Pulmonary Disease (COPD)

Solutions:

Ambient air pollution control or suspended particulate matter mitigation has been a key challenge for these industries. Typically, these emissions have been controlled with water sprays, wet scrubbers, nozzles and other prominent technologies. However, maintenance of these equipment often pose a challenge for industries. In addition, water spraying to control fugitive emissions is unsustainable and only partially effective.

Hence, a technology that is filterless, sustainable, covers large areas, is low in costs and highly effective would prove to be a boon for these industries and policy makers. A technology 'Pure Skies' by Devic Earth launched sometime in 2018 after 10 years of rigorous R&D seems to be the key to this problem. The technology, invented by Dr. Srikanth Sola, a renowned Cardiologist works on the principal of Radio waves in the ISM frequency band. As the waves go into the spectrum, these waves create a temporary charge on the suspended particulate matter present in the air causing them to collide coagulate and fall to the ground. This technology accelerates the natural clearance of particles or dry deposition as well known thereby improving air quality by 50% minimum. Lab studies and rigorous installations have proven to offer a concrete solution to these industries across top 3 companies in each of these sectors in India. A couple of case studies prove that the solution has a huge

potential to disrupt the Indian and global scenario forever. The technology is at its nascent adoption with huge demand coming in from these industries in India and Chile. The company behind the technology Devic Earth aims to reach out to all the associations in India and globally to introduce the technology as a benchmark for all the industries.

A Case Study

Pure Skies was installed at one of India's leading cement and Steel manufacturing plants to mitigate the problem of high, often unaccounted emissions. Despite having in place pollution control systems, the plant still faced high emission of pollutants, and associated risks such as opposition from neighboring communities, and also the administrative roadblocks in terms of closing the plant and/or being charged heavy fines.

Case Studies: Within one month of installation at the Cement Plant, Pure Skies:

- Reduced PM2.5 levels by 48%
- Reduced PM10 levels by 50%

Within four months of installation at the Steel Plant, Pure Skies:

- Reduced PM2.5 levels by 83%
- Reduced PM10 levels by 76%

The plant benefitted from the immense drop in pollution levels and enjoyed the security and enhanced performance enabled by Pure Skies.

