

# Non-Recovery Type Stamp Charging Coke Oven

## A Technology, Aligned With “Viksit Bharat” Aspiration



Pilot non-recovery coke oven with stamp charging facility

**I**N the early stages, the CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR), Dhanbad, focused on inferior-grade coking coal for coke production, as most of the coke-making technologies were imported and based on by-product recovery processes. To address this, CSIR-CIMFR developed solely heated bee hive ovens, initially with multi-chimney designs and later with single chimneys. As part of efforts to enhance energy efficiency, advanced heating and insulation systems were incorporated into non-recovery coke ovens. In response to growing demands for higher productivity, improved coke quality, and the use of lower-grade coals, CSIR-CIMFR introduced the stamp charging system with a coke quenching process.

Currently, a significant portion of India's coking coal needs is met through imports, but one potential solution to reduce this reliance is the partial substitution of imported coal with cheaper indigenous alternatives while maintaining the required coke quality for blast furnace operations. Modern coke-making technologies now enable the use of low-grade domestic coals for metallurgical purposes, although a few technological challenges remain to be addressed for large-scale adoption. To tackle these issues, CSIR-CIMFR developed non-recovery coke ovens, which are favoured for their lower capital costs, reduced pollution, and operational flexibility compared to by-product ovens.

### Advancing Sustainable Coke Making for “Viksit Bharat” 2047

The nine priority areas as outlined in the recent Union Budget have direct and indirect links with the recent advancements in coke-making technology and reinforce our commitment to the growth journey towards Viksit Bharat by 2047. CSIR-CIMFR designed Non-recovery type stamp charging coke oven is one of the advanced technologies with low capital investment, lower emission intensity and ease with operational flexibility and therefore carries the potential to attract Private Investment as aimed by Government to spur Private Driven Research Mechanism and participate effectively towards more efficient and competitive economy for a sustainable future.

The indigenous coke oven technology offers transformative societal benefits, aligning with the Government of India's visionary Atmanirbhar Abhiyan initiative. By leveraging low-grade indigenous coals, this technology enables self-sufficiency in metallurgical coke production, reducing dependence on imported resources. This breakthrough has far-reaching implications for India's steel industry, augmenting fuel resources to meet the growing demand for enhanced steel production.

Moreover, the adoption of this technology generates substantial employment opportunities. Each non-recovery type coke plant installation creates direct and indirect jobs for approximately 100 individuals, contributing to local economic growth and community development. This ripple effect stimulates regional prosperity, fostering a vibrant ecosystem of industries, entrepreneurs, and skilled workers.

### Facility & Technical Aspects

CSIR-CIMFR provides design and consultancy services for the construction of a 0.09MTPA coke oven battery for using different coal (both indigenous and imported coal) as well as the utilisation of inferior quality coal. What makes a difference in this non-recovery tech from that of a by-product coke oven is the facility to control the quantity of air into the cooking chamber for partial combustion of evolved coal gas for direct heating and the remaining part burnt into the