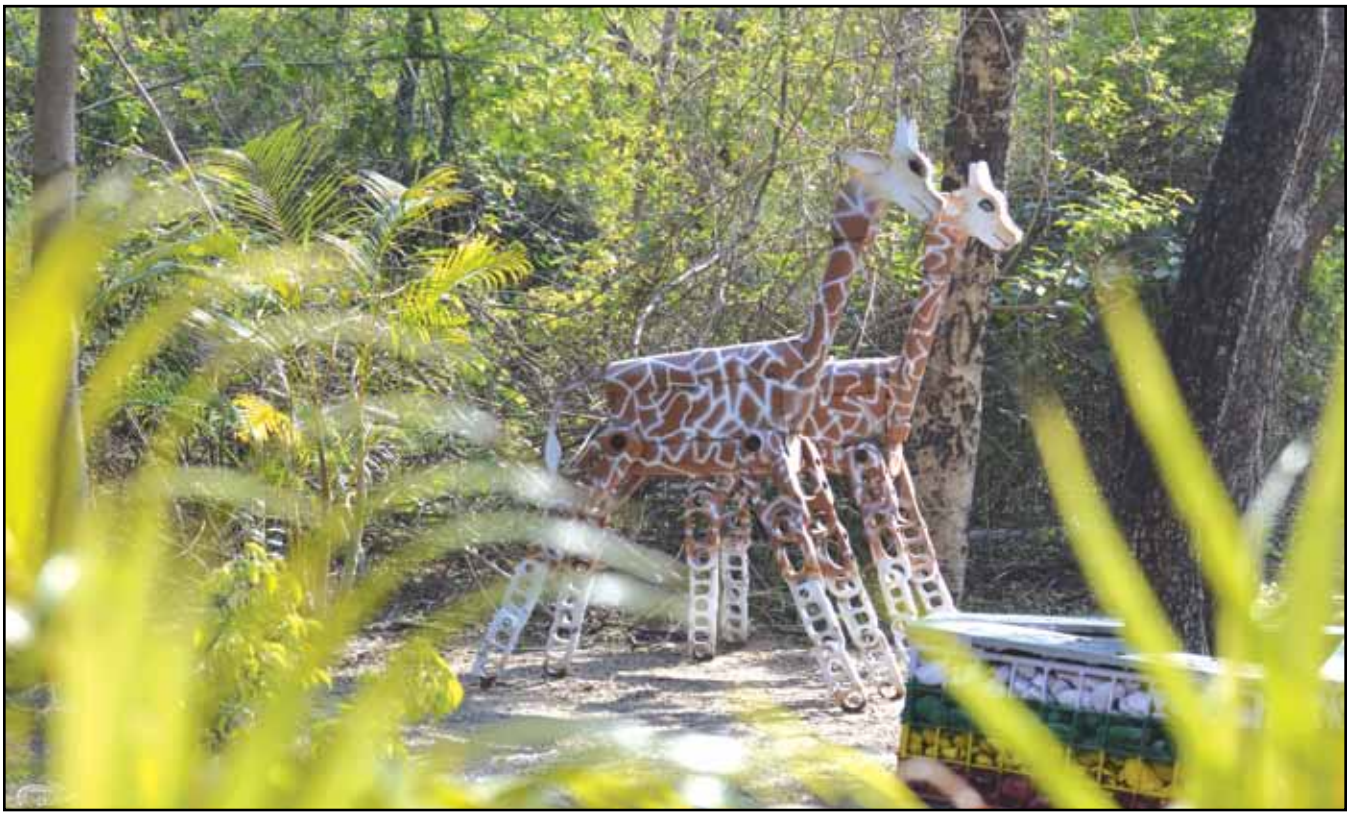
7
Chapter



# SUSTAINABILITY IN COAL MINES

# SUSTAINABILITY IN COAL MINES

## 1.0 Introduction

Sustainable development has commonly been considered as an oxymoron in the setting of a natural resource that is finite. The centuries-old practises of mining have tended to prioritise short-term advantages rather than taking into account the negative effects on the environment and communities. With the advancement of technology and growing awareness of sustainability issues, the question of how to make mining sustainable has come to the forefront. Sustainability in mining thus involves at least the following:

- The environmental dimension places a focus on the natural environment's sustainability and the availability of natural resources.
- The social dimension emphasises the need for social and cultural sustainability, which connects to questions of benefit distribution, mining costs, and decision-making process.
- The economic dimension focuses on the costs associated with upholding standards of life and the economic sustainability of those standards.

## 2.0 Sustainable Development Policy of Coal/ Lignite PSUs

The coal/lignite PSUs under the Ministry are mindful of promoting sustainability in their mining and allied activities.

### (A) Coal India Limited (CIL)

A formal Sustainable Development Policy was developed by Coal India Limited in 2013 to promote sustainable development (SD) and inclusive growth. This policy encompasses mainly three components:

i. Environmental sustainability

ii. Socio-cultural sustainability

iii. Economic sustainability

The SD Policy reaffirms CIL's commitment to protecting the environment and biodiversity in order to maintain ecological balance, as well as its efforts to improve the sociocultural and economic conditions in the areas where its activities take place. For promoting sustainable development, CIL is committed to:

i. Adopt world class eco-friendly mining technologies

ii. Conserve natural resources by reducing, reusing, recycling, redefining and replacing.

iii. Neutralize the effect of mining through appropriate mitigative measures.

iv. Create income generation avenues/skill development.

v. Ensure society a better quality of life by providing basic infrastructure and management of services like water, health care, etc.

vi. Strive for conducting the business in an ethical and transparent manner.

CIL also complies with the principles of National Voluntary Guidelines as per Business Responsibility Report. It has Board level CSR & SD Committee to look after the CSR and SD efforts. Every year CIL publishes its Sustainability Report as per guidelines of sustainability reporting.

### (B) Singareni Collieries Company Limited (SCCL)

Since SCCL has been running coal mines for more than 130 years, environmental management in coal mining areas has been integrated into the development and planning of mines. To continuously evaluate how well environmental standards are being followed in coal mines and to provide appropriate channels for putting environmental protection measures into action and promoting sustainability, SCCL has formed a dedicated Environment Department.

SCCL has developed an Environmental policy, which states that "To be a role model in protection of environment for sustainable development, SCCL is committed to implement the best global practices in all its operations through prevention / mitigation of pollution, proper disposal / recycling of wastes and bringing awareness among all the stake holders for continual improvement in environmental performance".

### (C) NLC India Limited (NLCIL)

NLC India Limited, a Navratna Govt. of India Enterprises, A giant Public sector undertaking in southern India, incorporated in late 50s, is the prime player of open cast Lignite/ coal, Mining, Power Generation and in renewable energy on PAN India for more than six decades.

NLCIL strives hard to achieve its environmental, socio-cultural and economic sustainability goals through its Corporate Environmental Policy, Code of Conduct, Fraud Prevention Policy, Whistle Blower Policy, Internal Code of conduct for prevention of insider trading, Related Party Transaction Policy, Dividend Distribution Policy, CSR Policy, R&R Policy, Training Policy, Career Growth Policy, Occupational Health & Safety Policy, Code of Corporate fair disclosure practices for prevention of insider training.

## 3.0 Establishment of Sustainable Development Cells (SDC)

Recognizing the importance of bringing sustainability in mining practices, Sustainable Development Cells have been established in December 2019 at Ministry level and also in all coal/lignite companies with an aim to channelize the efforts for promoting sustainability with uniformity and adopt the best practices by sharing of knowledge and experience.

### SDC & JT Section at Ministry Level

A Sustainable Development Cell at Ministry of Coal (MoC) has been created under the Chairmanship of Joint Secretary to advise, mentor, plan and monitor the mitigation measures taken by the coal companies for maximizing the utilization of available resources in a sustainable way and minimizing the adverse impact of mining by mitigation to improve ecosystem services and act as nodal agency for such activities. Subsequently, the Ministry of Coal has renamed SDC as Sustainability & Just Transition Division comprising Sustainable Development Cell (SDC) and Just Transition (JT) Section.

It works in the role of a mentor as well as a supervisor of coal/lignite PSUs in the above matter. This cell also formulates the future policy framework for sustainable development activities for coal/lignite PSUs. The Sustainability & Just Transition Division is established with following objectives to improve the overall image of coal sector in the country:

- To advise, mentor, plan & monitor the mitigation measures taken by Coal/Lignite PSUs for maximising resource utilisation in a sustainable way.
- To minimise the adverse impact of mining and establish a sustainable environment around coal regions to improve ecosystem services
- To share and replicate the best practices of sustainable mining
- To take up the issues of carbon neutrality, mine closure based on just transition principles & climate change.
- To disseminate best practices of sustainability through reports, films, documentaries etc.

### SDC at CIL &its Subsidiaries

SD Cell at CIL has been constituted under the Chairmanship of Director (Technical), CIL. Similarly, SD Cell at each subsidiary consist of multi-disciplinary team under the Chairmanship of respective Director (Technical/P&P). At CMPDI, the Committee has been constituted with Director (Technical/ES) as Nodal Point for SDC. All the SDCs work in unison for achieving the objective of promoting sustainable development in Coal/Lignite Sector.

### SDC at SCCL

In compliance of the guidelines issued by Ministry of Coal (MOC), a "Sustainable Development Cell (SDC)" has been established in SCCL under the Chairmanship of Director (Planning & Projects), General Manager (Environment) as Secretary and one officer each from Project Planning, Estates, Forestry, Exploration (Hydro-Geology), Energy Management and Civil Departments.

### SDC at NLCIL

NLCIL has also established a "Sustainable Development Cell (SDC)" with Chief General Manager (Land) as Chairman and 3 officers from Civil, Horticulture and Agriculture to assist. Director (Mines) is monitoring the overall activities of SDC.

The SDC Cells are adopting a systematic approach, starting from collection of data, analysis of data, and presentation of information, planning based on information from project authorities, adoption of best environment management practices, innovative thinking and site-specific approaches.

Meetings are conducted at regular intervals by the SDC & JT Section of Ministry to review the progress of various sustainable activitiesof coal/lignite PSUs, namely creation of eco-parks, mine tourism, mine water utilization, biological reclamation of OB dump and backfilled areas, environmental audit of mines, ecological studies in mines, promoting alternative usage of OB, energy efficiency measures, air quality management in coal mining areas, publication of status report/good practices and other sustainability related matters of coal/lignite sector etc.

## 4.0 Environmental Sustainability Management

In order to achieve environmental sustainability, the following is a brief explanation of the environmental protection measures being adopted by coal/lignite PSUs in coal mining areas:

### 4.1 Air Quality Management

Drilling, blasting, loading, unloading, and transportation of coal and OB are the main causes of dust generation. Wet drilling is used to reduce dust generation. Dust suppression systems are also included with drill machines. Surface miners and BWEs are being used more frequently, which reduces the need for drilling and blasting and, thus, the pollution load. Vehicles get routine maintenance in accordance with the manufacturer's specifications.

At locations of loading, transfer, and unloading in mines, dust suppression systems are in place. Additionally, washeries, CHPs, Feeder Breakers, Crushers, belt conveyors, haul roads, and coal stock areas have water-spraying systems installed to capture fugitive dust. To keep dust from getting airborne, all of the roads connecting mines, CHPs, workshops, and colonies have been blacktopped.

By planting grasses on slopes and plants on the dump top as soon as they form, it is possible to greatly reduce the amount of dust that is produced by the OB dump due to wind. Roadside avenue plantations are grown to reduce dust. Plantation is done around the quarry and OB dumps, acting as a barrier to stop dust from being carried in the air.

The trucks are being covered with tarpaulin and mist spray systems have been installed. For the purpose of controlling air pollution, fog cannons, wheel washing systems, motorised road sweepers, etc. are being used. It is encouraged to dispatch coal using the rail, MGR, conveyor, and tube conveyor networks.

**Fig. Mist Gun operation to control dust**

**Fig. PM 10 Analyser in CCL**

**Fig. Surface Miner with water jets, Gevra OCP, SECL**

According to statutory provisions, the ambient air quality in and around coal mines is routinely measured, and the results are communicated with regulatory agencies. For real-time monitoring of ambient air quality parameters, opencast mines have also installed Continuous Ambient Air Quality Monitoring Systems (CAAQMS), which are connected to SPCB websites. If necessary, additional pollution control techniques are implemented to lower the air quality level to acceptable levels.

**Fig. Mobile sprinklers in operation for suppression of dust**

**Fig. SCCL_Surface Miner at Koyagudem OC**

**Fig. Avenue Plantation Sathupalli- Kothagudem Highway by SCCL**

NLCIL has an in-house lab (CARD) accredited by NABL with a sufficient number of pollution monitoring devices, and it regularly monitors the air quality on alternate days in accordance with the Consent to Operate (CTO).

In accordance with the TNPCB, NLCIL installed 13 AAQ stations for the purpose of monitoring the Air Quality Parameters. Of the 13 AAQ stations, 10 are located in nearby villages and are under the supervision of the renowned IIT-Madras, whose results are also submitted to statutory authorities. So far, there have been no reported non-compliances.

## 4.2 Water Quality Management

In Indian coal mines, the mine water is often of good quality. The only criterion for which sedimentation, a physical process, is used to treat, is suspended solids. The suspended solids are settled in the mine sump before being discharged. High suspended particles and oil & grease concentrations are characteristic of effluents from workshops and CHPs. Effluent treatment plants and/or oil and grease traps have been installed for workshops and CHPs. STP facilities are being installed for treatment of domestic effluent.

Controlling and removing water pollutants and contaminants in order to make the water safe for reuse is the goal of water quality management. Reusing treated water for home and industrial purposes reduces or eliminates the need for freshwater from other sources. Coal/Lignite PSUs strive to leave the smallest possible water footprint on the surface water regime. Only a small number of CIL mines have experienced the issue of acidic mine water, for which appropriate pollution control systems have been built and put into place. Before releasing the run-off water into the natural water regime, steps are taken to prevent soil erosion and arrest suspended solids, such as the building of toe walls, garland drains, settling ponds, gabions, cribs, check dams, and rock fill dams.

The zone of influence caused by mining operations on ground water level is only evident up to 1,000 metres from the mine's boundary, according to scientific research based on routine groundwater level monitoring. The project's domestic and industrial water requirements are sustainably satisfied by using mine water or an old, abandoned quarry. Additionally, following adequate treatment, mine water is also provided to a local town for domestic use.

Additionally, mine wastewater that complies with prescribed statutory norms is released into nearby drainage systems, ponds, and agricultural fields, acting as a continuous source of recharge and raising the water level in the mining area. In mines and colonies, water saving techniques are being used. In every mining area, buildings for collecting rainwater are being built. To ensure compliance with applicable requirements, the quality of surface water, ground water, and mining effluents are periodically monitored. Both open wells and piezometers built in mining areas are used to measure ground water levels.

**Fig. ETP at Kakri OCP, NCL**

## 4.3 Mine Closure, Bio-reclamation & Land Use Management

Before mine operations even begin, planning for mine closure must be completed. Throughout the course of the planning process, it must be periodically reviewed and modified as necessary to be compliant with social and environmental challenges. The planning for the mine closure has several goals, including:

- To construct a self-sustaining ecosystem and to restore the physical, chemical, and biological quality that was damaged by mining to an acceptable level.
- To enable effective and sustainable after-use of the site
- In order to safeguard public health and safety.
- To stop environmental degradation and promote environmental sustainability as an outcome.
- To reduce negative socioeconomic effects.
- To safeguard the local flora and fauna.
- Making good use of the resources.

Plans for mine closure include both final and progressive elements. While the Final Mine Closure Plan aims to leave the site as safe, sustainable, and as close to its pre-mining status as is reasonably possible, the Progressive Mine Closure Designed to address to repair damages as soon as possible to limit their long-term impact. All operating coal and lignite mines currently have mine closure plans that have been approved, and mine closure activities are being carried out in accordance with the approved plan.

The improvement of the landscape affected by mining activities is one of the biggest objectives of the mine closure plans. Since there is no usable mine void during the initial phase of mining, the overburden (OB) produced by the mine is stored outside the excavated area. As the mine voids become available the OB generated is backfilled in the quarry. This continues throughout the life of the mine. Progressively, the non-active external dumps and backfilled sites are subjected to biological reclamation. After 1-2 years of technological reclamation, when the soil has stabilised, biological reclamation is typically started.

The mined-out land's rehabilitation process primarily focuses on the following:

- Restoring the land to its pre-mining land use or that consistent with the surrounding land.
- Maintaining the long-term stability of the affected land to match with the community and commercial needs.
- Besides plantation, the reclaimed areas are also being developed in parks, flora & fauna sanctuaries, grazing land, ponds and playgrounds with ecological, tourist and commercial values are planned.
- Solar Panels on reclaimed areas are also being planned.
- Hi-tech cultivation has also been taken up on the mined out / reclaimed areas. Bamboo plantation and grassing of OB dumps/back-filled areas are also being done
- Plantation has also been taken up in degraded forest lands of surrounding area with concurrence of State Forest department and also in private lands in the mine surroundings in the form of Social Forestry /CSR.
- Extensive Avenue plantation has been taken up along the approach roads/routes leading to the connecting surrounding villages.
- Some of the coal companies have developed their own nurseries for developing saplings of native species of plants. Seedlings are also distributed to local population to sensitize plantation by local people.

In the current fiscal (till November, 2022), Subsidiary of CIL have planted 30.18 lakh saplings covering an area of about 1567 Ha. In addition CIL has covered 7 Ha of land under Bamboo Plantation and 300 Ha under grassing. In FY 2022-23, as on November, 2022, SCCL planted about 13.9 lakh saplings over 482 Ha land and NLCIL in the current fiscal (as on November, 2022) planted 2.42 lakhs saplings over an area of 140.5 ha.The target vis-à-vis achievements as per Vision Document is given below:

| As Per Vision Document | | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|---|---|---|---|---|---|---|
| Plantation Area (Ha) | Cumulative Target | 1600 | 3400 | 5400 | 7600 | 10000 |
| | Achievement | Achieved | 3520 | 5790 | 7986 (till Nov.) | - |
| Plantation Nos (lakh) | Cumulative Target | 40 | 80 | 130 | 176 | 200 |
| | Achievement | Achieved | 81 | 132 | 179 (till Nov) | - |

Thus, Coal/lignite PSUs have not only enhanced their production level over the years to meet the rising energy demand but also shown their sensitivity and care towards native environment by adopting various mitigation measures including reclamation of mined out areas and extensive plantation in and around coal bearing areas.

Till 2022, coal/lignite PSUs have brought more than 58000 Ha land under green cover by plantation of about 144 million trees thus creating substantial carbon sink and contributing towards India's NDC target. It is envisaged to bring about 24000 Ha of addition area (in and around coal mining areas) under green cover by plantation of around 60 million trees by 2030. Since the last few years, grass bedding / seed ball stabilization of OB dumps have been taken up in earnest. Its success story is as under-

**Fig. Green cover developed by CCL along embankment of Damodar River in NK Area**

**Fig. Green cover developed by BCCL at Sijua Tetulmari in Dhanbad**

**Fig. Massive Plantation in Nigahi OCP, NCL**

**Fig. Plantation over vacant land by SCCL**

## 5.0 Adoption of Star Rating System for Mines of CIL

### BACKGROUND

5.1 Coal mining operations are expected to comply with many rules & regulations. These are mainly regarding safety, environment, rehabilitation of project affected families, welfare of workers etc. Although all the mines are expected to comply with all the regulations, there are some digressions in varying degrees.

5.2 The mining sector has kept evolving and becoming more efficient. Safer mining techniques are coming up. Some mines are leading others in terms of adoption of best practices. Also there is considerable variation if we consider the economic performance of different mines. It becomes important to identify the best performers in terms of above mentioned areas and give them due recognition. The star rating of coal / lignite mines is expected to do the same.

### STAR RATING POLICY

5.3 It had been planned to implement a system of self-evaluation and subsequent validation by Coal controller's organization of all coal mines under various factors covered broadly in seven modules as follows:

1) Mining Operations Related Parameters

2) Environment related parameters

3) Adoption of Technologies: Best Mining Practices

4) Economic performance

5) Rehabilitation & Resettlement related parameters

6) Worker related Compliance

7) Safety and security related parameters

5.4 Total 50 evaluation parameters in Open cast Mines and 47 in Underground Mines are specified

in these seven modules. In case of mixed mines having both UG and OC operations, the final rating of mines will be calculated on weighted average of coal production target of OC and UG sections of the mixed mine.

## 5.6 SUBMISSION OF INFORMATION AND DEVELOPMENT OF WEB PORTAL

A web portal has been developed by NIC, MoC for Star Rating of Coal Mines. Each coal mine is provided a login for the portal and the submission of self-evaluation takes place through this portal. The portal has the facility of uploading supporting documents concerning the evaluation parameters. The field offices of CCO are provided with separate logins to the web portal through which they can access the submissions of self-evaluation. The final remarks of validation committee for each evaluation parameter is recorded on the portal.

## 5.7 METHODOLOGY FOR SELF EVALUATION

Evaluation of the coal mines are divided into three category i.e. UG mines, OC mines and Mixed mines. The coal mines are to rate themselves as follows:

1) The sum of maximum points of all applicable parameters & sum of scored points is calculated.

2) The star rating is done on the basis of percentage of scored points.

The criterion for the same are as follows:

| CRITERION FOR | STAR RATING |
|---|---|
| PERCENTAGE SCORE | STAR RATING |
| 91 TO 100% | 5 STAR |
| 81 TO 90% | 4 STAR |
| 71 TO 80% | 3 STAR |
| 61 TO 70% | 2 STAR |
| 41 TO 60% | 1 STAR |
| 0 TO 40% | NO STAR |

## 5.8 METHODALOGY FOR VALIDATION

The Coal Controller's Organization is responsible for conducting the validation exercise after submission of self-evaluation. A system of peer review is followed for the top scoring 10 mines each in case of UG and OC mines and 5 in case of mixed mines and 10 mines at random selected by CCO irrespective of marks in order to ensure validation of data. Any falsification of uploaded date if found will attract Zero star rating for the mine for which decision of CCO is final.

## 5.9 PERFORMANCE

CCO has completed star rating for 357 mines of CIL, SCCL and NLCIL in 2020 for performance base year 2018-19 and results have been published. In 2021, all coal and lignite mines (including captive) have been involved for performance base 2019-20. Total reviewing and assessment by CCO Admin completed: 358 (OC: 182, UG: 158 and MX: 18).

Performance of Star Rating:-

| Rating Year | Name of Company | No of Mines assessed | Type of Mine | No of mines declared star rating | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | OC+UG+Mixed | 5 star | 4 star | 3 star | 2 star | 1 star | No star |
| 2018-19 | BCCL | 34 | 17+12+5 | 0 | 1 | 12 | 18 | 3 | 0 |
| | CCL | 44 | 37+7+0 | 0 | 4 | 23 | 10 | 7 | 0 |
| | ECL | 77 | 17+51+9 | 2 | 18 | 22 | 24 | 11 | 0 |
| | MCL | 19 | 15+4+0 | 0 | 2 | 12 | 5 | 0 | 0 |
| | NEC | 2 | 2+0+0 | 0 | 0 | 0 | 2 | 0 | 0 |
| | NCL | 10 | 10+0+0 | 2 | 5 | 3 | 0 | 0 | 0 |
| | SECL | 67 | 20+47+0 | 1 | 14 | 36 | 10 | 6 | 0 |

| Rating Year | Name of Company | No of Mines assessed | Type of Mine | No of mines declared star rating | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | OC+UG+Mixed | 5 star | 4 star | 3 star | 2 star | 1 star | No star |
| | WCL | 58 | 31+25+0 | 0 | 7 | 11 | 17 | 22 | 1 |
| | SCCL | 42 | 16+26+0 | 1 | 13 | 20 | 6 | 2 | 0 |
| | NLCIL | 4 | 4+0+0 | 2 | 2 | 0 | 0 | 0 | 0 |

| Rating Year | Name of Company | No of Mines assessed | Type of Mine | No of mines declared star rating | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | OC+UG+Mixed | 5 star | 4 star | 3 star | 2 star | 1 star | No star |
| 2019-20 | BCCL | 30 | 18+5+7 | 0 | 2 | 3 | 13 | 10 | 2 |
| | CCL | 41 | 36+5+0 | 0 | 3 | 23 | 12 | 2 | 1 |
| | ECL | 71 | 15+48+8 | 0 | 6 | 21 | 18 | 25 | 1 |
| | MCL | 18 | 15+3+0 | 0 | 1 | 2 | 6 | 7 | 2 |
| | NCL | 10 | 10+0+0 | 2 | 0 | 3 | 5 | 0 | 0 |
| | SECL | 63 | 20+43+0 | 2 | 4 | 33 | 18 | 6 | 0 |
| | WCL | 56 | 3+24+1 | 0 | 11 | 25 | 15 | 5 | 0 |
| | SCCL | 36 | 13+23+0 | 1 | 6 | 17 | 8 | 4 | 0 |
| | NLCIL | 4 | 4+0+0 | 3 | 0 | 1 | 0 | 0 | 0 |
| | Captive &Others | 29 | 20+7+2 | 8 | 8 | 7 | 4 | 2 | 0 |

## 5.10 ONGOING ACTIVITIES

CCO has already started activities for Star Rating of Coal/Lignite Mines for the base years 2020-21 and 2021-22 simultaneously.

| Mines participated in self-evaluation for base year: 2020-21 | | | | |
|---|---|---|---|---|
| Company | UG | OC | MX | Total |
| BCCL | 6 | 19 | 7 | 32 |
| CCL | 5 | 37 | 0 | 42 |
| ECL | 42 | 17 | 9 | 68 |
| MCL | 3 | 15 | 0 | 18 |
| NCL | 0 | 10 | 0 | 10 |
| NEC | 0 | 0 | 0 | 0 |
| SECL | 44 | 20 | 0 | 64 |
| WCL | 24 | 35 | 1 | 60 |
| SCCL | 22 | 16 | 0 | 38 |
| Captive and others | 6 | 30 | 1 | 37 |
| **Total** | **152** | **199** | **18** | **369** |

| Mines participated for self-evaluation for base year: 2021-22 | | | | |
|---|---|---|---|---|
| Company | UG | OC | MX | Total |
| BCCL | 4 | 20 | 5 | 29 |
| CCL | 5 | 37 | 0 | 42 |
| ECL | 47 | 17 | 9 | 73 |
| MCL | 3 | 15 | 0 | 18 |
| NCL | 0 | 10 | 0 | 10 |

| Mines participated for self-evaluation for base year: 2021-22 | | | | |
|---|---|---|---|---|
| **Company** | **UG** | **OC** | **MX** | **Total** |
| NEC | 0 | 2 | 0 | 2 |
| SECL | 43 | 21 | 0 | 64 |
| WCL | 22 | 35 | 1 | 58 |
| SCCL | 22 | 16 | 0 | 38 |
| Captive and others | 6 | 33 | 1 | 40 |
| **Total** | **152** | **206** | **16** | **374** |

## 6.0 Development of EPI (Environment Performance Index) and Environmental Audit:

The Ministry of Coal, Government of India had given a commitment to the Standing Committee on "Oral evidence on Compliance of Environmental norms by coal/lignite companies" held on 27th April 2017, for development of an Environment Rating Index of compliance in its coal mines, incorporating status of pollution (air, water, land and biodiversity) due to coal mining. The Index will measure the effectiveness and performance of the mitigation measures implemented to mitigate the negative impact in the form of compliance to EC and EMP.

Auditing and subsequent Index rating of mines will indicate the overall environmental status prevailing in the coal mining projects and also bring competition between mines for achieving excellence in environmental compliance.

CIL under the ambit of its MoU with ICFRE – Dehradun, assigned them the work for "Developing an approach and methodology for an index rating of environmental conditions & performance evaluation and Environment Performance Indexing in respect of compliance of EC conditions and third party mine auditing in selected 35 mines of CIL".Field visits are under progress in CIL subsidiaries for the said purpose. The status of report as on November 2022, 1 report completed, Draft report for 13 mines submitted to CIL, Field visits of 13 mines completed, and remaining 8 mines will be taken up.

SCCL awarded the work of auditing of compliance of EC and FC conditions in the following five Opencast Coal Mines of SCCL to ICFRE, Dehradun.

a. JVR OC-I.
b. GK OC.
c. Koyagudem OC-II.
d. MNG OC-II Ext.
e. Khairagura OC.

Accordingly, ICFRE conducted Environmental Audit and submitted reports to SCCL. SCCL submitted the reports to MoC. The recommendations given by the ICFRE are being implemented in the projects. Further, SCCL has identified following four more mines for auditing and the work is under progress:

a. PVK 5 Incline (UG Mine)
b. MNG OC Expansion Project
c. KTK OC III Project
d. RG OC III Project

NLCIL has awarded the work of Environmental Audit of three mines namely, Mine-I, Mine-IA & Mine-II of Nevyeli to Annamalai University, Chidambaram and same is under progress.

## 7.0 Best practices:

In the areas of reclamation, mining water utilisation, promotion of renewables, alternate uses for OB, energy efficiency measures, etc., coal/lignite PSUs have done a number of praiseworthy initiatives. The purpose of showcasing these works and practises is to encourage others to replicate them. Some of the best practices have been compiled hereunder:

### 7.1 Development of eco parks/tourism sites

### CIL

As on date, CIL has developed around 29 eco-parks and mine tourism projects. Some of the eco parks/

mine tourism sites developed by CIL in mined out areas and its command regions are Mudwani Dam Eco-park of NCL, Balgangadhar Tilak Eco-park of WCL, Chandrashekhar Azad Eco-park of MCL, Nigahi Eco-park of NCL, AnanyaVatika in SECL, Ananta Medicinal garden in MCL, Saoner Park in WCL, KayakalpVatika in CCL among others. Additionally, several other eco-parks are under different stages of development.

Further, approx. 30 new eco-parks are proposed to be developed by subsidiaries of CIL and take up expansion of 9 existing eco-parks. The sites for eco-parks have been identified and process has already been initiated by coal companies.

**Fig. Walkway in the Netaji Subhash Chandra Bose Eco-park (Ashok Vatika) of BCCL**


**Fig. Entrance gate of Kayakalp Vatika Eco-park of CCL**

**Fig. Seasonal visit of Migratory bird- Black Winged Stilt in Nigahi eco-park of NCL**

**Fig. Open gym developed in Balgangadhar Tilak eco-park at Jhurrey in WCL**

## SCCL

SCCL has developed an eco-park/tourism site in the reclaimed mining area of the Gautham Khani Opencast Project for recreation activities and tourism purposes in order to change the public's perception of coal mining as a polluting industry. The key highlights of eco-parks are lawns and gardens along with theme plantation, cacti and succulent garden, butterfly garden, water fountains, boating facility, bird watching facility, children park, Vinayaka Vanam, canteen and restrooms.

The Eco-Park is situated adjacent to Gouthampur village in Kothagudem mandal of Bhadradri Kothagudem district, Telangana State. The nearest railhead to the project is Bhadrachalam Road Railway Station which is at a distance of 12 Km. Railway Station is connected to the South Central Railway Dornakal junction on Chennai-New Delhi grand trunk line by a 55 Km long track which is also meant for coal transport. The park is well connected with State Capital, Hyderabad (280 Km) and the district head quarters, Bhadradri Kothagudem (10 Km) by road.

**Fig . Eco-Park developed at Gautham Khani OC by SCCL**


**Fig . Nursery developed near Gautham Khani Open Cast Mine**

## Eco-friendly Model Colonies:

Developing Eco-friendly Model Colonies in SCCL areas by incorporating effective municipal waste disposal system, establishment of Solar Power Plants, constructing Sewage Treatment Plants and Rain Water Harvesting pits etc. Such colonies are developed in Bhupalpally area and Sathupalli Town.

## Establishment of Eco-parks:

To change the negative perception of people about Coal Mining as a polluting industry and provide awareness about the hardships that goes in to produce coal to meet the energy demand of the Nation, SCCL proposed to develop Eco-park/Tourism site in the reclaimed mining area of GauthamKhani Opencast Project for re-creation activities and tourism purpose.

Foundation stone was laid for the proposed Eco-Park at Gautham Khani OC on 23.07.2020 by Hon'ble MLA, Kothagudem Constituency. The Park works are completed and it is proposed to inaugurate the park on Republic Day (26.01.2023).

## Mine Tourism:

SCCL identified closed GDK 7 L.E.P. UG mine near Godavarikhani (Ramagundam), Peddapalli District for mine tourism.

The Telangana State Road Transport Corporation (TSRTC) under Telangana Tourism has introduced "Singareni Darshan" (Coal Tourism), a tour package to Singareni Coal Mines to witness different mining activities. The "Coal Tourism" is an educational tour showing the process of coal production from opencast and underground mines, blasting activities, reclamation works in SCCL mines, Mines Rescue Station near Godavarikhani, electricity production from Singareni Thermal Power Plant (STPP) at Jaipur etc.

The "Coal Tourism" has been launched by Shri Bajireddy Goverdhan, Chairman of TSRTC, Shri V.C.Sajjanar,I.P.S., Vice Chairman & Managing Director, TSRTC and Shri N.Balram, I.R.S., Director (Finance), SCCL on 27.12.2022.


## NLCIL

NLCIL Eco Tourism Park at Mine-I & Mine-II, Neyveli, Tamil Nadu was inaugurated on the day of Vriksharopan Abhiyan held on 23.07.2020 & 19.08.2021 by the Hon'ble Union Home Minister and the Hon'ble Union Minister of Coal, Mine and Parliamentary affairs, Government of India respectively. Eco Tourism Parks are located 200 km south of Chennai, 65 km from Puducherry and 45 km from Chidambaram. The key highlights of the eco-parks are as under boating facility in artificial lake, birds watching, divine tree park having tree plants for all Stars and Raasi, children play area, cafeteria, medicinal garden, vehicle rides, rearing of livestock. The eco-park is open for public.


**Fig. Bird's eye view of NLCIL Mine-II Eco park**

**Fig. School Children playing in Children park at NLCIL Mine-I Eco park**

**Fig. Boating in Artificial Lake area**

**Fig. Children play area at Ecopark**

On the auspicious occasion of Vijaya Dashami i.e. 05.10.22, an MoU was signed between NLCIL and Pondicherry Tourism Development Corporation Ltd (PTDC) in the august presence of Chief Minister and Minister of Tourism, Puducherry and Director/Mines, NLCIL for promoting Mine Eco Tourism.

## 7.2 Mine water utilization

Mines, when viewed objectively, whether opencast or underground are water harvesting structures. During initial stages, the mines can temporarily effect the water table but once mining operations stabilize, they also act as water storage bodies. Post mining, all mines get filled up with natural precipitation, whether they are carved out areas of underground mines or backfilled area & voids in opencast mines. The drilling and blasting activities carried out by mining operations contribute to the secondary porosity and permeability by which ground water movement is facilitated to surrounding areas. It has been seen in many cases that once mining operations have been stopped, the water table in areas near to the mine increases.

The mine voids left at the terminal years of mining is converted into water reservoir and water is being

utilized. At present, there is greater emphasis on mine water treatment and its utilization by Ministry of Coal. Action plan is being chalked out and implemented by coal/lignite PSUs for mine water utilization for the community.

Mines have been providing treated mine water to the neighbouring communities both for domestic and irrigation use since past. Institutional arrangements under MoC sustainable development activities are now being undertaken to fulfil societal aspirations. This endeavour is in line with the Jal Shakti Abhiyan for water conservation campaign initiated by Government of India.

The mine discharge water is being treated in filter beds, settling tanks before supplying to employees and colonies. The mine water is being utilised for industrial & domestic purposes such as dust suppression, stowing, washing of machinery, fire fighting, drinking, and plantation. The excess water is discharged into settling tanks before discharging to nearby tanks for community use such as drinking and irrigation. The surplus water after above usages is being discharged into nearby tanks for ground water recharge and for further use of agriculture.

In the "Five Year Vision Document of Coal Sector" under Social & Environmental Responsibility, coal sector is aspiring to create potential for portable water supply to 45 lakh people (55 LPCD) and irrigate more than 3 Lakh acre land by 2023-24 by supplying about 4300 LKL of mine water.

In the coal/lignite PSUs, out of 7,848 Lakh Kilo Litre mine water discharge as on during FY 2022, around 47 percent of the water is used by the nearby communities both for domestic and irrigation purpose in 871 villages {CIL (727 Villages), SCCL (104 Villages) and NLCIL (40 Villages)}and 16.18 Lakh population is benefited. Another 38 percent of the water is used for own domestic and industrial purpose, 15% is used for ground water recharge resulting in zero discharge from mines and water that is acidic in nature and rest is kept as ground water recharge and for future use.

In FY 2022-23, Targets viz-a-viz Achievements (till November 2022) for mine water utilisation is as under:

| Mine Water Utilization | | CIL | NLCIL | SCCL | Total |
|---|---|---|---|---|---|
| Target (LKL) | Domestic/Drinking | 900 | 150 | 20 | 1070 |
| | Irrigation | 2100 | 250 | 580 | 2930 |
| | **Total** | **3000** | **400** | **600** | **4000** |
| Achievements (LKL) | Domestic/Drinking | 665 | 99 | 13 | 777 |
| | Irrigation | 1104 | 172 | 415 | 1691 |
| | **Total** | **1769 (59%)** | **271 (68%)** | **428 (71%)** | **2468 (62%)** |

Subsidiaries of CIL have signedMoU's with the State Governments for achieving the common goal of providing surplus water from suitable mines for use by habitations, located in the command areas of subsidiaries of CIL in the respective states. The details are as under:

- **MoU between Jharkhand Govt & CIL -** Utilization of mine water by villages situated in the command area of CCL, BCCL and ECL
- **MoU between West Bengal Govt & ECL -** utilization of mine water by communities for irrigation purposes
- **MoU between WCL & MAHAGENCO -** To provide mine water to MAHAGENCO power plants located near mines of WCL

- **MoU between WCL & Vidarbha Irrigation Development Corporation –** Providing surplus mine water to VIDC from mines of WCL
- **MoU between Chhattisgarh Govt & SECL –** Supply of Mine Water to PHED, Water Resource Department & other govt agencies

In addition, NLCIL supplies mine water to Chennai Metro Water Supply Scheme through Veeranam lake and SCCL is supplying excess mine water to community for drinking and irrigation purposes.

Apart from MoU's, subsidiaries of CIL, for beneficial use of mine water by the nearby community, continuously endeavoured departmentally in planning, designing, implementation and execution of various schemes successfully.

**Fig. View of site – Bishrampur pisciculture and water sports, SECL**

**Fig. RO Plant Facility at WCL**

**Fig. Mine water utilisation for irrigation purposes at NLCIL**

## 7.3 Promoting Renewable

In order minimize the carbon footprints of mining and to progress towards the goal of net zero carbon emission, coal/lignite companies are keen on promoting renewables. Coal companies are going for both roof top solar and ground mounted solar projects

CIL has already installed 12 MW of solar power plants, of which 2 MW of is ground mounted and 10 MW rooftop plants. These plants have generated more than 4 million units of solar energy in the FY 2022-23.

### SCCL

SCCL is proactive in exploring renewable source of energy. To protect environment, solar power plants are being established in all the mining areas of SCCL on a large scale.

SCCL planned for 300 MW solar power plants out of which 219 MW solar power plants are commissioned till Dec, 2022. Remaining 81 MW solar plants will be commissioned during 2023-24. Further, SCCL is exploring the possibility of setting up another 250 MW Floating Solar PV Projects on the water surface area of reservoirs of Telangana State.

**Fig. Solar Power Plant at STTP (10MW)**

## NLCIL

In line with the Government of India's initiative towards Renewable Energy, NLC India Limited has diversified its Generation portfolio from the basic conventional power generation to Renewable Energy Generation sources. NLCIL was the first Central Public Sector Undertaking to achieve 1000 MW Renewable Energy capacity. The total Renewable Energy installed capacity of NLCIL was 1421.1 MW as on 31.03.2022.

NLCIL has won 150 MW Hybrid Renewable Energy projects from Solar Energy Corporation of India Limited (SECI) tender, for which EPC tender is floated and evaluation is under process. NLC also has won 510 MW Solar PV Power Project from Indian Renewable Energy Development Agency (IREDA) tender against which 10 MW Solar project under Smart City Conversion at Neyveli is under development stage and for balance capacity, two separate EPC tenders are floated for a capacity of 200 MW & 300 MW for which tendering is in process. As per the approved Corporate Plan 2030 of the company, these projects are expected to be commissioned by 2023 and 2024 respectively.

It is proposed to have 4610 MW capacity addition from Renewables by 2030, there by cumulative RE capacity is approximately 35.12 % ( 6031 MW) of the total installed capacity (17171 MW) by 2030. This shows the directional migration of NLCIL towards green energy. Presently on an average 2000 MUs are being generated from the Renewable projects of NLCIL and thus contributing significantly to the environment through green energy.

To synergize the peer CPSUs, NLCIL has formed a Joint Venture Company with Coal India Limited, the Coal Lignite Urja Vikas Private Limited (CLUVPL) to offer technical & project consultancy services for the mining CPSUs.

NLCIL signed MoU with Assam Power Distribution Corporation ltd., (APDCL) on 09.08.2022 for the development of 1000 MW renewable Projects in Assam State.

MoU has been signed between NLCIL & Grid Corporation of Odisha (GRIDCO) on 01.12.2022 for setting up of Ground mounted / Floating Solar Power projects, Pumped Hydro Projects, green Hydrogen Projects and other renewable projects.

**Fig. The flat panel Multi / Poly crystalline silicon PV cell technology in Neyveli Township Block-4**


**Fig. Wind Mill in Kazhuneerkulam, Tirunelveli District**

## 7.4 Alternative usage of OB

Even as the mandate is to produce and despatch coal to its consumers, Coal/Lignite PSUs has taken up an out of box initiative to produce sand from overburden at a much cheaper price and usages of processed OB for stowing purpose. This will not only help in minimising environmental pollution due to sand siltation from overburden, but will be also an option for getting cheaper sand for construction purpose. Production of sand has already started.

During opencast mining of coal, the strata lying above coal seam is known as overburden comprising of clay alluvial sand and sandstone with rich silica content. The overburden is removed to expose and extract coal from beneath. After completion of coal extraction, the overburden is used for back filling to reclaim the land in its original shape. While extracting overburden from top, swell factor of the volume accounts for 20-25%. Initiative has been taken to utilise at least 25% of overburden in converting to sand by crushing, sieving and cleaning.

The very first initiative of such conversion has been taken by Western Coalfields Ltd. (WCL), a subsidiary of CIL in its mines. Initially a Pilot Project was launched where sand was extracted through machines erected departmentally. This sand has been offered to Nagpur Improvement Trust at a much cheaper price for constructing low-cost houses under Pradhan Mantri Awaas Yojana (PMAY). The price of sand is almost 10% of the market price with better quality. On huge success of the project and with growing demand of cheaper sand, WCL launched commercial production by commissioning the largest sand production plant of the country near Nagpur. This unit produces 2500 cubic metre of sand per day at about half the market price. Major chunk of the sand produced from this plant is being given to Govt. units such as NHAI, MOIL, Mahagenco and other smaller units at one third of the market price. Rest of the sand is being sold through open auction in the market which is helping locals to get sand at a much cheaper price. The use of overburden has minimised the volume of land required for overburden dump. This initiative also lowers the adverse footprint of river bed mining of sand. WCL is also selling overburden for road construction at a cheaper price to NHAI & others.

In this effort, Coal/Lignite PSUs has commissioned 4 OB processing plants and 3 OB to sand Plants. 8 Such plants are in the different stages of installation in the Coal/Lignite PSUs. This effort will not only help the society at large but will also help in minimising river bed mining of sand.

WCL has commissioned two OB to sand processing plants. The sand segregated from OB formations is being provided to agencies which are implementing housing under government schemes like Pradhan Mantri Awas Yojana (PMAY). In 2021-22, 15,274 m3 of sand has been generated from re-handling of 23,498 m3 OB.In 2022-23, as on 30th Nov. 2022, 9,642 m3 sand has been generated from re-handling of 14,833 m3 OB. Further, one OB to sand processing plant has been commissioned in September 2022 in ECL for stowing purpose.

SCCL received "Golden Peacock Innovative Product/ Service Award" for the year 2015 at Dubai for utilisation of Processed Overburden (POB) in stowing operations in place of river sand. About 39.90 Lakh Cu.m of processed overburden material has been used for stowing in 20 different underground mines of SCCL from 2011-12 to October, 2022. Further, SCCL is in the process of producing commercial sand from overburden of OC Mines for the purpose of civil constructions. The construction of plant has been completed and trial run is ongoing.

Centre for Applied Research & Development (CARD), NLCIL has undertaken a research project jointly with IITM Chennai approved by Ministry of Mines during 2018 for conversion of overburden materials into aggregates. Under this project, a small bench scale pilot plant was installed at CARD and testing & trial runs are in progress. The preliminary study indicated that overburden (OB) materials contain 40% to 70% sand and considerable quantity of clay. After investigation, IIT Madras certified that the sand extracted is found to be suitable for construction & plastering works. Further, NLCIL is also in the process of producing commercial sand from overburden of mines for the purpose of civil constructions. At Mine-IA, setting up of M-sand beneficiation plant of 2.62 LM3 per Annum (BOO – Build Own Operate model for 7 Years) is under tendering process. For the Second Plant, the tender document is under circulation.

**Fig. OB to Sand plantat Gonegaon Area, WCL**

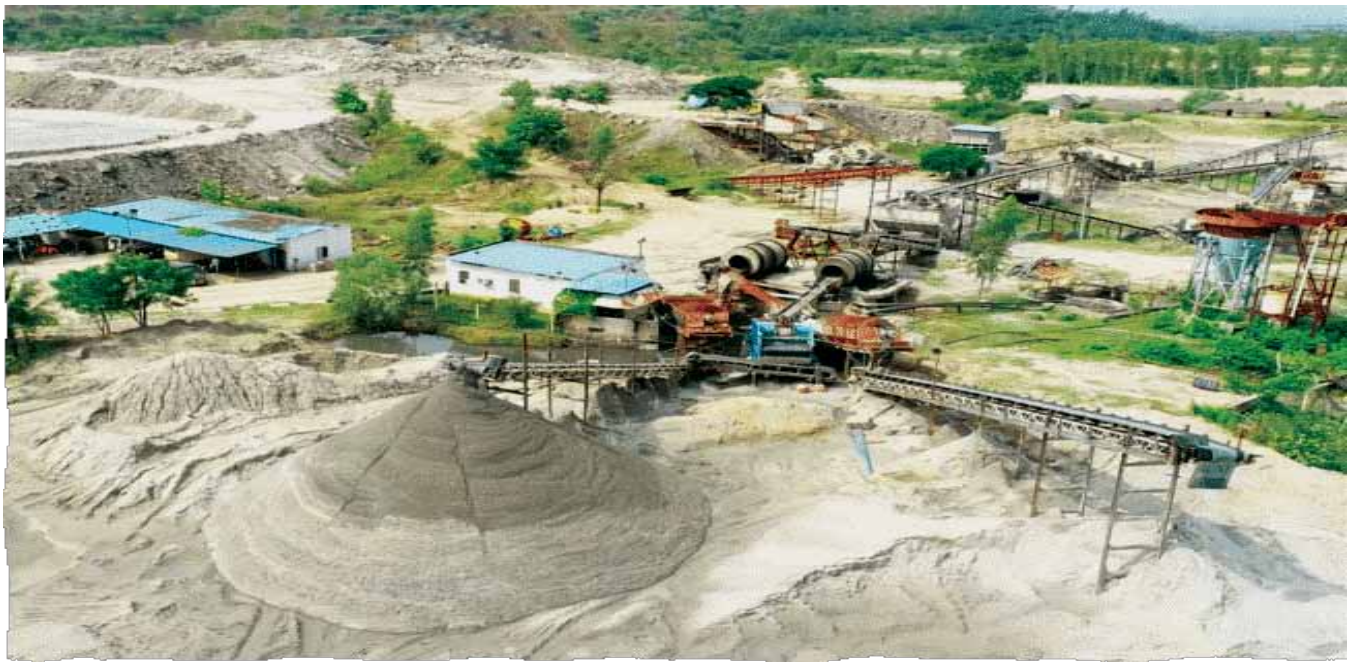


**Fig. OB to Sand Plant at Srirampur OC Mines, SCCL**

## 7.5 Energy Efficiency Measures

Efficient use of energy resources and their conservation assume tremendous significance as one unit of energy saved at the consumption level reduces the need for fresh capacity creation by 2 times to 2.5 times. Further, such saving through efficient use of energy can be achieved at less than one-fifth the cost of fresh capacity creation. Most importantly, energy conservation also translates into reduction of carbon footprint. Coal companies also have several areas for implementing energy efficiency measures:

- Colonies, buildings, offices, industrial establishments, rest houses etc.
- Various mining activities – HEMM, Transport, Ventilation, Pumping etc.
- Efficient Power Supply Management and many other avenues

Coal companies have been taking of various energy conservation and efficiency measures over the years and have envisaged various efficiency measures to be taken in coming years:

- Reducing electricity /diesel consumption by taking appropriate measures after comprehensive energy audit
- Replacing conventional lights by LED lights
- Replacing conventional ACs and other appliances by energy efficient Star rated appliances
- Installation of capacitor banks and other measures to improve power factor
- Use of auto-timers in street lights
- Use of Energy efficient pumps (EESL)
- Deploying E-Vehicles (EESL)

By implementing various energy efficiency measures, Coal/lignite PSUs have envisaged to create additional carbon offset potential of 1 Lakh Ton/annum.

CIL has signed MOU with EESL to implement Energy Efficiency Programs at CIL and Subsidiaries. This shall cover Building Energy Efficiency Projects (BEEP), Replacement of old fans, ACs and conventional light

fittings, motors, adoption of e-vehicle, installation of distributed and rooftop solar projects.

### 7.5a Achievement for Energy Efficiency

CIL has installed 95,151 LED lights, 626 no. of energy efficiency ACs, 13,600 no. super fans, 20 no. of e-vehicles, 213 energy efficiency water heaters, 113 energy efficiency motors, 863 auto timers and 38,570 no. of capacitor banks in the current Fiscal.

### 7.6 First Mile Connectivity Projects

CIL has taken steps to upgrade the mechanized coal transportation and loading system under 'First Mile Connectivity' projects. In the first phase, CIL has identified 35 First Mile Connectivity (FMC) Projects in mines having capacity 4 Mty and above, of 414.5 MTPA capacity. These Projects shall help increase mechanized evacuation from 150 MTPA currently to 565 MTPA by 2023-24. These infrastructure Projects shall help in improving coal quality, savings in under-loading charges and a positive impact on the environment.

Out of these 35 FMC Projects, 6 Projects of 82 MTPA capacity has been commissioned and 3 Projects of 30 MTPA are anticipated to be commissioned by Mar'23. Projects of 300MTPA capacity are under various stages of construction and are on schedule. The LOA/Work Order of 2 FMC projects of 32 MTPA has been terminated since site for construction for these projects could not be handed over due to pending forestry clearances. All the FMC Projects of Ph-I are anticipated to be completed by FY 23-24.

### FMC Ph- II :

In FMC Ph - II 9 FMC Projects of 57 MTPA has been planned,out of which 3 FMC Projects totaling to 14 MTPA are under construction.

The remaining 6 Projects are under different stages of formulation and tendering.

All the FMC Projects in IInd Phase are anticipated to be commissioned by FY 24-25.

After implementation of FMC Ph- I and FMC Ph-II, Coal India Limited will increase the mechanized evacuation to 623 MTPA by FY 2024-25.

### FMC Projects in SCCL

### First Mile Connectivity (FMC) Projects of SCCL:

To achieve the targeted dispatches through rail by reducing road transport of coal, it is proposed to construct three new CHPs (Phase-I) under First Mile Connectivity. SRP OC CHP& JVR OC CHP Completed. Naini CHP works are included in MDO scope.

Under Phase-II FMC projects, VK OC CHP (10MTPA) and under Phase-III, RG OC3 CHP are planned.

**JVR OC CHP and railway line- Development of Infrastructure for Coal evacuation:**

1. **SRP OC CHP:** (Capacity : 3.50 MTPA)

   Works completed on 05.11.2019 & Rail link became operational from 13.01.2020.

2. **JVR CHP:** (Capacity : 10.00 MTPA)

   CHP and 54 KM BDCR to Sattupalli railway line commissioned on 28.05.2022.

3. **Naini CHP:** (Capacity : 10.00 MTPA)

   MCRL is constructing a 68 Km common railway corridor for coal evacuation form the coal blocks in Chendipada area in Talcher coal fields. (Phase I of14 kms & Phase II of 54 kms). Phase-I completed and phase-II (54km) will be completed by March 2026 as per MCRL. Completion of inner corridor of 68 kms is critical for completion of Naini CHP. In the absence of Railway siding, SCCL is contemplating utilization of HANDAPA siding, which is 52 kms away from the project.

4. **VK CHP:** (Capacity : 10.00 MTPA)

   It is relay of existing RCHP of 8 MTPA. Existing RCHP will be in operation till completion of VK7 CHP. It is expected to be completed by April, 2025.

5. **RG OC III CHP:** (Capacity : 5.00 MTPA) (modernization and capacity addition of the existing CHP). Firm completed the Soil investigation & Topographical survey at site. It is expected to be completed by October, 2024.

## FMC Projects in NLCIL

### Railway siding:

- Work order issued to RITES on 22.06.2022 for preparation of revised DPR and detailed engineering for railway infrastructure due to implication of additional cost due to construction of addl. Bridges over Jalbhandar land. M/s. RITES has submitted the Revised DPR on 02.07.2022 and approved by Competent Authority.
- The required quantity of rails has been received at site.
- Project has been planned in Three packages namely **A, B &C with estimated project cost of ₹ 554.45 Cr.**
- **Package A -** Construction of Bridges over Jalbhandar Land:
  - NIT issued for Package A on 22.10.2022.
  - Tender opened on 15.12.2022.
  - Completion Timeline of Package A is March2024.
- **Package B & Package C :**
  - Earthwork, P-way, Track linking and Construction of Minor Bridges & one Major Bridge over Bheden River.
  - Preparation of tenders (Package B and C) under process by M/s RITES.
- **Package D –** Signalling and Telecommunications
- **Package E –** General Electrical and OHE Works
- Targeted timeline for Completion of Railway corridor is **July 2024.**

### Coal Handling Plant (CHP) :

- Construction of Coal Handling Plant (CHP) including silo system is under the scope of MDO.
- MDO has issued LoA to M/s HOWE Engineering, Ahmedabad on 29.10.2021 for Construction of Coal Handling Plant on 29.10.2021.
- The Scope of Work includes - Design, engineering, civil works, manufacture/ fabrication & assembly, inspection and testing, Erection, commissioning and performance

guarantee test of CHP.

- ❖ Site Office has been established.
- ❖ Construction work of Truck Loading Station (TLS) and Main receiving sub Station (MRSS) is under progress
- ❖ Expected date of Completion: Aug 2023.
- ❖ Project cost of ₹ 369.65 Cr.

## 8. Indian Coal Sector developing a comprehensive mine closure framework on principles of Just Transition

Ministry of Coal has taken various steps to mitigate adverse impacts of coal mining and has aligned itself to the sustainable environment friendly practices for the areas affected by various coal mining activities. One such aspect is dealing with the mine closure cases of abandoned/closed/legacy mines or mines to be closed in near future based on the principle of Just Transition (JT) for All.

With passage of time, old mines will shut down due to exhaustion of reserves, viability issues, safety reasons etc. which will require proper closure addressing the social, physical & environmental aspects of closure to ensure sustenance of livelihood of people and communities dependent on the mines. Due to the closing of mines, a vast amount of land will become available, which has a huge potential for regional transformation and economic diversification. Therefore, Indian Coal Sector has initiated efforts for developing a comprehensive mine closure framework on JT principles. Just Transition can be explained as a Transition which is just, fair and equitable for all stakeholders where livelihoods of each impacted persons are secured, and no one is left behind.

Global expert agencies such as World Bank and GIZ (a German Development Agency) have approached Ministry of Coal to offer their expertise for developing a Coal Mine Closure Framework based on JT Principles. These proposals aim to create a mine closure framework on a pilot basis for mines in Jharkhand/ Chattisgarh that have previously been closed, abandoned, or are about to close due to resource exhaustion and develop few closed mines as pilot projects. The envisaged Coal Mine Closure Framework will provide support to livelihood of impacted local people and community on Just Transition Principles along with repurposing of the reclaimed land & infrastructure assets for economic diversification of coal regions. The framework will be backed by a strong policy support, strong institutional arrangement, sustainable funding mechanism and tool for stakeholder consultations.

Parliamentary Consultative Committee attached to Ministry of Coal also discussed the emerging issue of Coal Mine Closure – Achieving Just Transition for All on 09.11.2022 in Indore. During the discussion, the Committee Members appreciated the efforts being undertaken by the Ministry of Coal and Coal/Lignite PSUs towards coal mine closure. The members acknowledged the initiatives taken by the coal sector to further develop coal mine closure framework and expressed hope that by adopting best global practices and application of principle of Just Transition to closure of mines will be a big step forward for social equity and justice.

In the process of economic transition of the coal region, the reclaimed land and mine asset will be repurposed by engaging public / private firms to create avenues for employment and revenue generation such as solar parks, eco-parks, fish-farming, warehouse, resorts, museum, picnic spot, golf course, pumped hydro using OC/UG voids and other energy related infrastructure.

With the lessons learnt in the process, the closure framework will get refined gradually, help in capacity building and creation of a robust structure for managing the mine closures that may happen in long term.


**Fig. Hon'ble Union Minister Shri Pralhad Joshi chaired the Consultative Committee - Coal Mine Closure – Achieving Just Transition meeting at Indore**